

VILLANOVA UNIVERSITY CATALOG

UNDERGRADUATE STUDIES

1998-1999

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VILLANOVA
UNIVERSITY
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An Equal Opportunity Educational Institution

VILLANOVA UNIVERSITY CATALOG

UNDERGRADUATE STUDIES

COLLEGE OF LIBERAL ARTS AND SCIENCES
COLLEGE OF ENGINEERING
COLLEGE OF COMMERCE AND FINANCE
COLLEGE OF NURSING
PART-TIME STUDIES

1998-1999
VILLANOVA, PENNSYLVANIA

GENERAL INFORMATION

The University campus is situated in Villanova, Pennsylvania, on Lancaster Pike (U.S. Route 30) six miles west of City Line Avenue in Philadelphia, Pennsylvania. The post office address is 800 Lancaster Avenue, Villanova, Pennsylvania 19085-1699. University offices are open Monday through Friday from 9 A.M. to 5 P.M. The telephone number is (610) 519-4500. The World-Wide Web address is <http://www.vill.edu>.

Prospective students may obtain additional information by writing to the Director of Admissions, Villanova University, 800 Lancaster Avenue, Villanova, Pennsylvania 19085-1699.

Villanova University is an affirmative action institution, and it is the continuing policy of Villanova not to discriminate against any person on the basis of race, color, sex, religion, national origin, age, veteran status, non-job-related disability or any other basis prohibited by law.

NOTE: In order that programs offered by Villanova University reflect current advances and additions to knowledge and upgraded professional requirements, Villanova University reserves the right to change programs and requirements without prior notice. Students generally are bound to the requirements in effect for, and published in the University *Catalog* for the year in which their class begins its first year of study. Special requirements may be in effect for students who have left the University and are being readmitted.

Students are advised to retain as a reference the copy of this *Catalog* in effect during their first year at Villanova, and to check with their college offices regarding changes that may affect them. Additional academic information may be obtained from the various college offices.

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Aug. 19,20	Walk-in Registration and Student Services for Part- Time Students
Aug. 22-25 (Sat-T)	Freshmen Orientation and Registration
Aug. 26 (W)	Classes Begin
Aug. 29	Saturday Classes Begin
Sept. 1 (T)	Last Day for dropping and/or adding classes and for requesting satisfactory/unsatisfactory
Sept. 7 (M)	Labor Day - No Classes
Sept. 10 (Th)	St. Thomas of Villanova Day*
Oct. 16 (F)	Mid-Term
Oct. 19 (M)	Semester Recess
Oct. 26 (M)	Classes Resume
Oct. 30 (F)	Last Day for Authorized Withdrawal without Academic Penalty (WX)
Nov. 24 (T)	Thanksgiving Recess Begins after last class
Nov. 30 (M)	Classes Resume
Dec. 14 (M)	Final Day of Classes
Dec. 15 (T)	Reading Day
Dec. 16-22 (W-T)	Final Examinations (No exams on Sunday)

Spring Semester

Jan. 5	Part-Time Studies Orientation
Jan. 7	Walk-In Registration and Student Services for Part- Time Students
Jan. 11 (M)	Classes Begin
Jan. 16	Saturday Classes Begin
Jan. 15 (F)	Last Day for dropping and/or adding classes and for requesting satisfactory/unsatisfactory
Feb. 26 (F)	Mid-Term
Mar. 1 (M)	Semester Recess
Mar. 8 (M)	Classes Resume
Mar. 12 (F)	Last Day for Authorized Withdrawal without Academic Penalty (WX)
Mar. 31 (W)	Easter Recess begins after last class
Apr. 6 (T)	Classes Resume
Apr. 28 (W)	Final Day of Classes
Apr. 29-30 (Th-F)	Reading Days
May 1-8 (Sat-Sat)	Final Examinations (No exams on Sunday. May 8: Saturday Classes only)
May 15-16 (Sat-Sun)	Baccalaureate and Commencement

*Classes run on an accelerated schedule and finish by 1:30 PM.

Tuesday, April 27th will be deemed a Thursday Class Day (Day Classes Only)

Wednesday, April 28th will be deemed a Friday Class Day (Day Classes Only)

VILLANOVA UNIVERSITY

BACKGROUND

For a century and a half, Villanova has been directed by the Order of St. Augustine, known as the Augustinians, one of the oldest religious teaching orders of the Catholic Church. The first American foundation of the order within the present limits of the United States was established in 1796 at old St. Augustine's Church in Philadelphia. Villanova University traces its lineage from this foundation and from St. Augustine's Academy, which was opened there in 1811.

In January 1842, the Augustinians resident at St. Augustine's took possession of Belle Air, the country estate of the Revolutionary officer and merchant John Rudolph. In accordance with the old Catholic custom, the new foundation was placed under the patronage of a saintly hero of the past. For their patron the Augustinians chose, St. Thomas of Villanova, a 16th century Spanish Bishop who was a distinguished Augustinian writer and educator. The school soon became known as Villanova and gave its name to the surrounding countryside.

Classes were opened in the old mansion house at Belle Air during the fall of 1843. On March 10, 1848, the Governor of Pennsylvania, Francis R. Shunk, signed the Act of the Legislature incorporating The Augustinian College of Villanova in the State of Pennsylvania and conferring on Villanova College the right to grant degrees in the Arts and Sciences.

The Liberal Arts College took its first step toward university status in 1905 with the establishment of what is now called the College of Engineering. The Science unit, inaugurated in 1915, is now an integral part of the present College of Liberal Arts and Sciences. In 1918, what is presently known as the Part-Time Studies Division came into being. The College of Commerce and Finance was founded in 1922, the College of Nursing in 1953, and the School of Law in 1953.

Villanova's development over the years into a complex institution of higher education received official sanction when, on November 10, 1953, pursuant to an act of the Legislature of the Commonwealth State of Pennsylvania, its charter was amended to permit its being designated Villanova University.

MISSION STATEMENT

Villanova University is an independent coeducational institute of higher learning founded by the Augustinian Order of the Roman Catholic Church. The University is a community of persons of diverse professional, academic, and personal interests who in a spirit of collegiality cooperate to achieve their common goals and objectives in the transmission, the pursuit, and the discovery of knowledge. This community serves society by developing and sustaining an academic environment in which the potentialities of its members may be realized. Villanova is committed to those same high goals and standards of academic integrity and excellence as well as personal and corporate achievement that characterize all worthy institutions of higher learning.

As a Catholic institution Villanova both emphasizes the values of the Judaeo-Christian humanistic tradition and concerns itself with all value systems. The University attempts to develop an environment in which students, faculty, and staff may experience a Christian intellectual and moral perspective, believing that the teachings of the Catholic faith are applicable in every area of human activity. Although Villanova functions as an independent institution in the conduct of its own affairs, in matters theological it recognizes its obligations to the Magisterium of the Church. Villanova looks to the Order of St. Augustine to preserve the University's Augustinian character through its presence and influence and by providing personnel and financial support. In turn, the University recognizes its special relationship to the Order of St. Augustine by showing appropriate preference to Augustinians in the initial appointment of faculty and staff.

Given its character and resources, Villanova is committed to offering such undergraduate and graduate programs as will best serve the needs of its constituencies. As a medium-sized comprehensive university, it offers

Undergraduate Studies

programs in the humanities, in the natural and social sciences, and in professional areas such as business, education, engineering, law, and nursing. The University emphasizes undergraduate instruction and is committed to a liberal arts component in each of its undergraduate programs. In all academic departments, it encourages such research and scholarly work as are compatible with the faculty's other obligations to the University.

Villanova emphasizes the disciplines of philosophy and theology. Moreover, it seeks to add its influence to the search for world peace and justice by means of both its academic programs and the pastoral ministry it provides for the members of the University community. In like manner, the University has always encouraged and supported its faculty, students, and staff in providing public service to the community. Ultimately, all these programs and support are seen as a means of developing the total person: intellectually, emotionally, spiritually, culturally, socially, and physically.

Villanova attempts to enroll students with diverse social, geographic, economic, and educational backgrounds. Furthermore, in utilizing its financial aid resources to help achieve this diverse student body, Villanova recognizes its responsibility to use part of those resources to assist the economically and educationally disadvantaged.

Villanova welcomes students who consider it desirable to study within the philosophical framework of Christian humanism. Similarly, the University seeks to employ on all levels those who are sympathetic to and supportive of its character and identity. Accordingly, Villanova confidently expects that all students, faculty, administration, and staff will so comport themselves as to assure the continuance and enhancement of the University's high purposes and its moral and religious traditions. In accomplishing its purposes, the University fully complies with all the requirements of federal and state legislation with respect to equality of opportunity and non-discrimination.

Villanova encourages communication among all the elements of the academic community and operates on a policy that promotes easy access of students to faculty and of students and faculty to administrators. Furthermore, it seeks to involve students, faculty and administrators in the development of University policy through appropriate structures of governance.

Finally, this community seeks to reflect the spirit of St. Augustine by the cultivation of knowledge, by respect for individual differences and by adherence to the principle that mutual love and respect should animate every aspect of University life.

ACADEMIC PROGRAMS

DEGREE PROGRAMS

Programs of undergraduate study in the various colleges lead to the following degrees:

College of Liberal Arts and Sciences: Bachelor of Arts, Bachelor of Science, Associate of Arts, Associate of Science in Natural Science.

College of Engineering: Bachelor of Chemical Engineering, Bachelor of Civil Engineering, Bachelor of Computer Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering.

College of Commerce and Finance: Bachelor of Science in Accountancy, Bachelor of Science in Business Administration, Bachelor of Science in Economics

College of Nursing: Bachelor of Science in Nursing

To qualify for the Bachelor's Degree, the student must have completed successfully one of the four-year courses of study as specified by the University together with other work assigned. The award of the degree is conditioned not upon the attainment of any fixed number of credit hours, but upon the satisfactory completion of all the studies prescribed for the degree sought. Details are available in each college's sections of this *Catalog*.

ACCREDITATION AND RECOGNITION

Villanova's courses of study are approved by the Department of Public Instruction of Pennsylvania and by the Board of Regents of the State of New York. The University is accredited by the Middle States Association of Colleges and Secondary Schools, the American Chemical Society and the American Bar Association. All four

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degree programs of the College of Engineering have been accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The degree program in computer science is accredited by the Computer Science Accreditation Commission of the Computing Sciences Accreditation Board, a specialized accrediting body. Villanova University is recognized by the United States Navy as a training center for Reserve Officer Training (NROTC).

Degree programs within the College of Commerce and Finance are fully accredited by the American Assembly of Collegiate Schools of Business (AACSB).

The Baccalaureate Program in Nursing is approved by the Pennsylvania State Board of Nurse Examiners and is accredited by the National League for Nursing; this accreditation includes preparation for beginning positions in public health nursing.

PART-TIME STUDIES

Villanova offers the opportunity for part-time study to a variety of students who are not able or do not wish to enroll as full-time matriculated students. Students may pursue Bachelor's Degrees on a part-time basis in: Accountancy, Business Administration, Communication, Computing Science, Education (secondary), English, History, Human Services, and Mechanical Engineering. Details on these programs and requirements are to be found in the Part-Time Studies section of this *Catalog*.

INTERNATIONAL STUDIES

The Office of International Studies offers to all full-time Villanova students:

- ? Information, assistance, and support in completing area studies concentration requirements in Arab & Islamic Studies, Irish Studies, Russian Studies, and Latin American Studies.
- ? Information and assistance in planning and completing overseas academic summer, semester, or year programs in Europe, Asia, Latin America, Africa and the Middle East.
- ? Information and coordination of Villanova Summer Programs overseas located in Birzeit (West Bank), Cadiz (Spain), Dijon (France), Freiburg (Germany), Galway (Ireland), Siena (Italy), Urbino (Italy) and Valparaiso (Chile). These programs are approximately six weeks in length and offer two courses for six (6) Villanova credits and each has a Villanova faculty program director.

Ordinarily, students study abroad in their sophomore or junior year, maintain a 2.75 or better GPA on a 4.0 scale, have good health, and receive the prior approval of the Director of International Studies, their Departmental Chairperson and their College Dean.

Villanova University has special exchange relations with Bethlehem University, Birzeit University, University of Cadiz, University College of Galway, University of Glasgow, King's College London, University of Lille (ESPEME), Lorenzo de Medici Institute, Pontifical University of Madrid (ICADE), University of Urbino, and Victoria University of Manchester. Villanova is associated with Beaver College Center for Education Abroad (BCCEA), Butler University Institute for Study Abroad (BUISA), Boston University International Programs, the Council on International Educational Exchange (CIEE), the Institute for European/Asian Studies (IES/IAS), the Institute for International Education (IIE), NAFSA, the Association of International Educators, the School for Field Studies (SFS), and the School for International Training (SIT). In addition, the Office of International Studies sponsors Fall and Spring Orientation seminars, Welcome Back conferences, peer counseling, film and lecture series, and special overseas study nights.

Students wishing further information should contact the Director of International Studies in the St. Augustine Center, Room 415 (519-6412).

ACADEMIC ADVANCEMENT PROGRAM (AAP)/Act 101

The purpose of the Academic Advancement Program (AAP)/Act 101 is to provide an educational opportunity for students from Pennsylvania who meet the academic and economic criteria established by the Higher Education Opportunity Act of 1971, legislatively designated and publicly known as Act 101.

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The AAP recruits highly motivated students whose high school credentials suggest that they can, with academic support, successfully matriculate at Villanova University. At Villanova, these students are given support in counseling and tutoring to enable them to demonstrate their potential to succeed in college. The pre-college component now offers a 3-credit freshman English course, math, reading/study skills, and chemistry classes, word processing, and critical thinking workshops.

The Program is administered by the Office of Multicultural Affairs; further information may be obtained in 202 Vasey Hall, (610-4075).

NROTC

Villanova University, in a long standing relationship with the United States Navy, maintains one of approximately 60 Naval Reserve Officer Training Corps units in the United States. The objective of the unit is to educate prospective officers for the Navy and Marine Corps. Reserve commissions as ensign or second lieutenant are awarded upon successful completion of prescribed naval science courses and graduation from the University. These commissioned officers will serve on active duty for a period of four to nine years, depending upon choice of warfare specialty.

Admission to NROTC is accomplished through either the Scholarship or College Programs. Students in the NROTC Scholarship Program receive a substantial subsidy from the Navy, including tuition, books, fees, and a \$150 monthly subsistence allowance. They take three summer cruises and receive a reserve commission in the Navy or Marine Corps upon graduation.

Candidates for the NROTC College Program (Non-Scholarship students) apply directly to the Villanova NROTC Unit prior to commencement of the fall semester of their freshman year. Selections are made by the Professor of Naval Science. Students in the College Program receive no government subsidy until their junior and senior years, during which they receive a \$150 monthly subsistence allowance. They take one summer cruise and receive a reserve commission in the Navy or Marine Corps upon graduation. A limited number of direct appointments to scholarship status are made available each year to those NROTC College Program students who stand at or near the top of their College Program class in terms of overall academic performance and aptitude for commissioned service.

In addition to the four year programs described above, two-year NROTC Scholarship and NROTC College Programs are available. Students must apply for these programs early in the spring semester of their sophomore year. Those selected for the two year programs must successfully complete a six week training course during the summer preceding their junior year. Upon enrollment in the NROTC Program at the beginning of their junior year, two-year program students have the same options and benefits, and assume the same active duty obligation, as four-year program students.

All Scholarship and College Program students may select any major at the University. Midshipmen at Villanova study in a wide variety of majors in engineering, arts, sciences, business, and nursing.

Detailed NROTC information may be obtained from the Naval Science office, Room 101, John Barry Hall. *NOTE: Applicants for the NROTC program are not relieved of the necessity for payment of the registration deposit required by their letter of acceptance for admission to Villanova University.*

ARMY ROTC

Villanova students are eligible to participate in the Army Reserve Officers Training Corps (ROTC) Program through a formal cross-enrollment agreement with the Widener University Department of Military Science. Army ROTC offers students the opportunity to graduate with a college degree and a commission in the United States Army, Army National Guard, or United States Army Reserve. All Army ROTC classes are conducted on the Villanova University campus.

The Army ROTC Program involves undergraduate courses taken during the freshman and sophomore years, and advanced courses taken during junior and senior years. Students may enroll in the introductory courses without incurring any military or financial obligation and may withdraw at any time, subject to Villanova University's course withdrawal policy. Students who participated in Junior ROTC in high school or have prior military service may receive placement into the advanced courses as determined by the Army Professor of Military

Science. The introductory course requirements may also be satisfied through attendance at a six-week Army ROTC basic camp at the end of the sophomore year. Students in the advanced courses are required to attend a six-week Army ROTC Advanced Camp between their junior and senior years. Students enrolled in the advanced courses receive a stipend of \$150.00 per month and may incur an active duty obligation of up to two to four years. National Guard and Reserve Forces options are also available.

Nursing students who complete the four-year or two-year program, obtain their Nursing Degree, and pass their Nursing Board Examinations are commissioned into the Army Nurse Corps.

Four-year, three-year, and two-year Army ROTC scholarships are available on a competitive basis. Scholarships also include payment of certain university fees, a book and school supplies subsidy, and a \$150 per month stipend.

Applications for the three-year Army ROTC scholarships must be submitted early in the spring semester of the freshman year; applications for the two-year Army ROTC scholarships must be submitted early in the sophomore year. Applications for attendance to the Army ROTC Basic Camp must be submitted early in the spring semester of the sophomore year.

Detailed information may be obtained from the Professor of Military Science, Widener University, Chester, PA 19013, (610) 876-2446 or (610) 499-4097.

AIR FORCE ROTC

Villanova students are eligible to participate in the Air Force Reserve Officer Training Corps (AFROTC) through a cross-enrollment agreement with Saint Joseph's University. All Aerospace Studies courses will be held on the Saint Joseph's campus. The AFROTC program enables a college student to earn a commission as a Second Lieutenant in the U. S. Air Force while concurrently satisfying requirements for his/her baccalaureate degree.

The program of Aerospace Studies offers both two-year and four-year curricula. In the four-year curriculum, a student takes the General Military Course (GMC) during the freshman and sophomore years, attends a four-week summer training program, and then takes the Professional Officer Course (POC) in the junior and senior years. A student is under no contractual obligation to the Air Force until entering the POC or accepting an Air Force scholarship. In the two-year curriculum, a student attends a six-week summer training program and then enters the POC in the junior year. Students opting for the two-year curriculum must apply for acceptance into the POC by the end of the first semester or quarter of their sophomore year.

Air Force ROTC offers 1, 2, 3 and 4 year scholarships on a competitive basis to qualified applicants. Four-year scholarships are available to high school seniors in various fields. The scholarships are offered to cadets enrolled in the AFROTC program and to college entrants to AFROTC. All scholarships cover tuition, lab fees, reimbursement for books, plus a \$150 tax-free monthly stipend. All members of the POC, regardless of scholarship status, receive the \$150 tax free monthly stipend.

Detailed information may be obtained from the Professor of Aerospace Studies, AFROTC Det 750, Saint Joseph's University, Philadelphia, Pennsylvania 19131, (610) 660-1190.

ACADEMIC LIFE

ADVISING

Villanova takes seriously the responsibility of academic advising. Students are urged to consult with their academic advisers on a regular basis. Each College has its own advising system. For details, see the college sections that follow in this *Catalog* and consult the various college offices.

AUGUSTINIAN HISTORICAL INSTITUTE

The Augustinian Historical Institute promotes the research and publication of studies in the history of the Augustinian Order and in the allied fields of theology, philosophy, missiology, and biography. Located in the Augustinian Room of Old Falvey, the Institute maintains an exceptional collection of books, manuscripts, reviews and micro-copies pertinent to these studies. The collection of the Institute is open for use between the hours of 8:30 A.M.-4:30 P.M.

DEAN'S LISTS

Each year the Dean of each college at Villanova honors those students who are deemed to have established an outstanding academic record as determined by the College and its Dean. To qualify for the Dean's List, a student must be a full-time student with a semester average of 3.25 in the College of Engineering, 3.5 in the College of Nursing, 3.5 (for both semesters) in the College of Liberal Arts and Sciences, and 3.5 in the College of Commerce and Finance with no non-passing or missing grades on the semester report.

HONOR SOCIETIES

In addition to the many honor societies appropriate to individual colleges and academic disciplines and departments, Villanova has chapters of these national honor societies:

Phi Beta Kappa

The Sigma Chapter of Phi Beta Kappa was established at Villanova in 1986. Membership in Phi Beta Kappa is an honor conferred primarily in recognition of outstanding scholarly achievement in the liberal arts and sciences. Details may be found under "Phi Beta Kappa" in the Liberal Arts and Sciences section of this *Catalog*.

Phi Kappa Phi

Phi Kappa Phi is an honor society whose objective is the recognition and encouragement of superior scholarship in all academic disciplines. Qualified part-time juniors and seniors are eligible for election to membership. Admission is by invitation only and requires the nomination and approval by a chapter. Superior scholarship and good character are the criteria for membership.

Alpha Sigma Lambda

The Mu Chapter of Alpha Sigma Lambda was established at Villanova University in 1958. The society honors those dedicated part-time and evening students who have completed at least 30 Villanova credits and who are from the highest ten per cent of their class with a minimum quality point average of 3.2

INFORMATION TECHNOLOGIES

The Office for University Information Technologies (UNIT) provides computing, information, and communication services to the entire campus community.

A campus-wide network for data, voice, and video communication provides phones and data connectivity for students, faculty, and staff. A state-of-the-art digital phone system offers students, faculty, and staff direct dial lines, voice messaging, mail boxes, and call transfer. The data network facilitates access to all computing resources on campus as well as access to remote computing resources via the INTERNET. Broadband cable facilitates video transmission to and from more than 100 classrooms for implementation of multi-media teaching technology into the curriculum.

UNIT maintains several central computers for academic and administrative use, two clustered Digital VAX 4500s, three Data General AVION multi-processor computers and many specialized servers. Central computing is complemented by more than sixty NOVELL and MS-NT servers throughout campus. All central and distributed computers and about 3000 workstations are connected to the campus network providing each user with access to any computing resource. Every faculty and staff member has a PC connected to the campus network. High speed data connectivity is extended to all residence hall rooms. Dial-up lines plus a Remote Access Service facilitate access to network and World Wide Web resources from off-campus locations.

In addition to many college and department-specific student computing labs, UNIT manages three student labs located, in Mendel, Tolentine, and Bartley with over a total of over 200 workstations. The labs are open 18-24 hours a day with consultants on duty to assist students. All computers support general purpose applications such as word processing, spreadsheets, graphics and data base management systems plus course-specific software. The Student Computer Support Center (SCSC) located in Vasey Hall assists students with University promoted notebook computers and other PCs. Technical support is complemented by WWW based documentation.

The use of the UNIT managed computing, information, and communication resources are governed by policies included in the Student Handbook and accessible on the University's WWW site from any computer workstation.

Throughout the semester, UNIT offers a wide range of non-credit seminars that cover popular software packages as well as general computing and communication issues. BYTELINE, UNIT's newsletter keeps the user community informed about new developments, upcoming seminars and other general computing and communication issues.

LIBRARY RESOURCES AND SERVICES

Falvey Memorial Library is the gateway to information resources and services for students, faculty and staff of Villanova University. Information is available through more than 700,000 volumes, 3,800 current serial subscriptions, approximately one hundred and forty electronic indices, several hundred full-text electronic journals, and extensive microfilm and audiovisual collections. With Pulling Law Library, Falvey shares in a selective depository status for federal government documents.

A wide range of services are offered by the Falvey Library staff including reference, interlibrary loan, circulation, reserve, database management and acquisitions. Reference librarians answer questions, recommend resources, assist with formulation of search strategies, and instruct in the use of electronic and print resources. Every librarian serves as a liaison with an academic department to facilitate library and departmental communication. The Falvey Student Advisory Council (FSAC) advises the Director of Falvey Library of the changing information needs of the Villanova student. Display areas provide information on campus activities and programs.

A collaboration between the library and academic departments provides students with the services and skills necessary for lifelong learning. Beginning in the Fall of 1998, a formal information literacy program, *Quest*, will be launched in collaboration with the Core Humanities Program. Through interactive Web screens, *Quest* will teach students the basic steps necessary to locate and retrieve the correct print and electronic resources in support of their research.

Instructional Media Services, located on the ground floor of Falvey, provides a wide variety of educational technology services to the university community. Services available to students include individual and group viewing (and listening) facilities for its collection of videotapes, CD's, audiotapes, laser discs, and CD-ROM's. Through faculty auspices, other services are available such as presentation rooms, transparency making, and video editing.

The Falvey Library homepage (www.vill.edu/library) provides a guide to the resources, services, policies, procedures and hours of operation. *FLASH* (Falvey Library Academic SearchH) offers access on and off campus to VuCat, the online catalog, and selected free databases, and on campus access to many subscription databases. Approximately forty-four public workstations are available in the library to access *FLASH*, search the Web, send and read email, and conduct word-processing operations. In addition, network ports are available around the building to connect personal notebook computers. Tables and carrels (as well as couches and reading chairs) are available for individual study and groups may use the Kolmer Group Study Rooms. Study space is also available in the coffee shop, Holy Grounds at Falvey, on the ground floor.

WRITING CENTER

Writing Center tutors offer assistance to undergraduates engaged in every kind of writing. Students are welcome to come to the Writing Center at any stage of their composing process. Walk-in appointments are welcomed, but scheduled appointments are strongly encouraged. An individual session takes approximately 45 minutes in length, and clients may request a specific tutor. The Center is located in the Dalton Room of Old Falvey Library and is open Sunday through Thursday, 1:30- 9:30 p.m., and Friday, 1:30-5:30 p.m. Phone: 519-4604.

STUDENT LIFE

Undergraduate Studies

CAMPUS MINISTRY

Reflecting the traditions of Roman Catholic and Augustinian spirituality, the Villanova Campus Ministry engages every aspect of University life through prayer, liturgy, community service, leadership development, and pastoral care. More specifically, Campus Ministry:

- ? Offers programs centered on Christian living, social justice, liturgy, and preparation for the sacraments with an emphasis towards creating and eliciting Christian community on campus;
- ? Works with all members of the Villanova community to build spiritual awareness and growth, initiates programs in response to the gospel values of the Catholic Christian tradition; and
- ? Encourages the development of student leadership as a priority reflecting the student's significant role both now and for the future of the Church and society.

Campus Ministry is located on the lower level of St. Rita's Hall. Regular weekday office hours are from 9 A.M. to 5 P.M. Appointments can be made in person or by phoning 519-4080. The daily Eucharistic Liturgy schedule is 8:30 A.M., 12:05 P.M., and 5:00 P.M. in Corr Chapel. The Sunday schedule of Liturgies, held in the Church of St. Thomas of Villanova, includes University Liturgies at 6:00 P.M., 8:00 P.M., and 10:00 P.M., and St. Thomas of Villanova parish Liturgies at 7:30 A.M., 9:30 A.M., and 11:30 A.M.

Detailed information on Campus Ministry activities, including programs for community service and leadership and for student involvement in liturgical celebrations, and information concerning other religious denominations' services and locations, can be found in *The Blue Book: The Villanova University Student Handbook*, issued annually by the Vice President for Student Life.

CAREER PLANNING AND PLACEMENT

The Office of Career Planning and Placement offers services and programs to help individuals assess career interests, plan careers, and develop the skills essential to successfully pursue career plans. Individual counseling is supplemented by workshops on topics such as résumé writing, interview skills, and career exploration. Interest tests are administered and interpreted. The credentialing service allows students to develop a file of recommendations to be used for graduate school and job applications. Approximately 300 companies visit the office each year to conduct interviews with graduating seniors, and many more companies list positions with the office. The office supplies registration materials for the Graduate Record Exam, Graduate Management Admissions Test and the Law School Admissions Test. The Career Library provides extensive information on careers, as well as information on full-time, part-time, and summer employment opportunities and post-graduate studies. The office is located in Corr Hall.

COUNSELING CENTER

The University Counseling Center, located in Corr Hall, Room 106, offers a number of services. Except for emergencies, appointments are required and can be scheduled either by phone (519-4050) or by visiting the Center.

Personal/Psychological Counseling

The Counseling Center helps students deal with personal concerns and decisions by providing a private and confidential setting in which to discuss the emotional impact of events that commonly occur during a student's normal developmental process. Counseling is provided on a voluntary basis. All contacts are completely confidential and are not recorded on the student's university records. Information is not released to anyone without the student's permission. The following services are available:

- ? Individual counseling to discuss areas of student concern, to provide emotional support during stressful periods, to help identify and change defeating habits and attitudes, and to increase awareness of alternative, productive behavior.

- ? Consultation with organizations, departments, clubs, faculty, and administrators to promote optimal functioning. Individuals may consult a psychologist about how to help a friend or family member who seems to need help.
- ? Group formation and programs on themes that interest students. Examples are: eating awareness; coping with the death of a loved one; interpersonal relationships; and time management.

Study Skills Counseling

Counselors are available to help students enhance their study skills and optimize their motivation and success in studying. Students receive help with time management, note taking, effective test-preparation and test-taking, and other skills related to academic performance. Individual appointments are available, as are group workshops, a schedule for which can be obtained by stopping by the Center. No advanced registration is required for workshops.

HEALTH SERVICES

The Health Center is open 24 hours a day when school is in session to attend to the health care needs of students. The University physician is present at 8 A.M. every morning except Sunday. He is present on Tuesday and Thursday at 12:30 P.M. The physician is available for urgent consultations and triage. The Health Center has facilities for inpatients when further observation is required. *Medications and specialists' consultation charges are the responsibility of the student.*

IDENTIFICATION CARDS

The official University identification card for students, staff, and faculty, is called the *Wildcard*. It is a photo ID with a magnetic stripe on the back. Photos are taken at the *Wildcard* Office on the first floor of Dougherty Hall (519-4179). Requirements for obtaining a *Wildcard* include a picture ID and proof of enrollment at Villanova. On the back of the card is a space for a verification sticker which is sent by the Bursar's Office after one's bill is paid. The *Wildcard* is necessary for student verification, student discounts, library borrowing, and for entrance into the library on weekends and weekday evenings.

INTERNATIONAL STUDENTS AND HUMAN SERVICES

The International Student Adviser's Office is a service provided by the university to aid foreign students in becoming oriented to the university and the community and assists them with U.S. immigration requirements. The office sponsors a variety of social and cultural programs in conjunction with the International Student Association. The office offers a comprehensive orientation program at the beginning of the Fall Semester.

All foreign students must register with the Director's Office each semester. Any change of address must be reported immediately. The office is located in Corr Hall, Ground Floor (519-4095). *NOTE:* Villanova University requires that all full-time students have health insurance. The International Student Office has information and policy forms available for students who do not have health coverage from their home countries.

MULTICULTURAL AFFAIRS

Through its multi-faceted programs and dimensions (Academic Advancement Program/Act 101, Affirmative Action Program, Volunteer/Outreach Programs, Coordinated Services for the Disabled, Mentoring Programs, Committee on Cultural Diversity, and Multicultural collaborative endeavors), the Office of Multicultural Affairs assists and supports the University in its mission of being a community of people who share common values and whose culture reflects the Augustinian spirit.

Affirmative Action

The Multicultural Affairs Office has been designated as the Affirmative Action/Equal Opportunity Office and has the responsibility of insuring that the University complies with local, state, and federal government mandates, and remains committed to equal employment and educational opportunities.

Human Services

The Office of Multicultural Affairs coordinates volunteers to provide assistance to those in need. The University, with the active involvement of student volunteers, cooperates with agencies and programs that offer aid to the elderly, the disabled, and the underprivileged in Philadelphia and the suburbs. Student volunteers obtain practical experience in various areas of social justice and responsibility. The Project Sunshine Volunteer commitments provide an average of 31,200 volunteer hours per academic year. The annual Sunshine Day mini-carnival for disadvantaged children and the Saturday Kids-on Campus' monthly program add further hours of outreach and opportunities for students to volunteer. The annual Christmas Giving Program for elderly people or others who are disadvantaged extends the outreach opportunity to the entire Villanova community.

The Office also works with those among Villanova's population who are faced with physical or learning challenges. The Office assists the University community in responding to the individual needs of these students, faculty, and staff members with regard to classroom environment, educational needs, accessibility arrangements, and basic support services.

MUSIC ACTIVITIES

The Music Activities Office promotes, maintains, and supervises the efforts of student performing groups on the Villanova campus. These groups include the University Bands (Concert, Marching, Pep and Jazz), the Band Front, the Villanova Singers, the Women's Glee Club, the Gospel Ensemble, and the Dance Ensemble, and the Student Musical Theater. Each organization is student-run under the musical direction of a staff professional. Information about musical opportunities can be obtained by contacting the Music Activities Office on the lower level of St. Mary's Hall (519-7214).

RESIDENTIAL FACILITIES

The University maintains a variety of living facilities which are intended to enhance the spiritual, academic, and social development of the students. Approximately 3200 men and women are housed in 18 residence halls which vary in capacity from home-type buildings for 20 students to modern multi-level structures housing over 500 students. An additional 600 students reside in on-campus, fully-furnished apartments.

Dining facilities for resident students are conveniently located in Dougherty Hall on the main campus, St. Mary's Hall on the west campus, and in Donahue Hall on the south campus. Lounge areas and laundry facilities are available to students in most residence halls.

Admission to the University and payment of admission deposit guarantees placement in residential facilities for the freshman, sophomore, and junior years. Commuters, transfers, and part-time students are eligible for on-campus residency only on a space-available basis. Students who cannot be housed on campus will be able to obtain assistance from the Office for Residence Life in locating off-campus accommodations. This office does not inspect, certify, or supervise off-campus accommodations listed by the coordinator for off-campus services. The Office for Residence Life does, however, reserve the right to refuse to list locations with this service for just cause.

All room reservations for on-campus housing are for a full academic year. Students who terminate their housing contracts prior to the end of the academic year, but who remain enrolled at the University will be assessed a Cancellation Fee of \$300. The fee is not applicable in the case of official withdrawal or removal by way of formal judicial action by the University.

More information on residential facilities may be obtained by contacting Residence Life, Kennedy Hall (519-4154).

STUDENT DEVELOPMENT

The Office of Student Development oversees the administration of all student organizations. Its aim is to provide a co-curricular program emphasizing leadership skills in order to help co-ordinate students' free time with their study and education. There are over 100 student organizations at Villanova. These organizations foster common interests among students and assist students in gaining leadership skills that complement the skills learned in the University academic programs. The interest areas represented at Villanova include: governance, programming, publications, politics, fraternities and sororities, academics, cultural activities, honor societies and

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special interest groups (yearbook, radio station, tech crew, etc.) A complete listing of organizations and information on how to join can be found in the Office of Student Development, 214 Dougherty Hall (519-4210).

UNIVERSITY SENATE

The University Senate is an advisory group to the University President and the Board of Trustees on policy. Representation includes faculty, administration, and students. The Senate meets at least three times each semester.

VETERANS

The Registrar's Office (Room 202, Tolentine Hall) serves as a liaison between the University and the Veterans Administration.

Veterans who will be enrolling in college for the first time should contact their local Veterans Administration Office to make application for a Certificate of Eligibility authorizing them to receive benefits while attending Villanova. This application should be filed at least six weeks before the veteran plans to enter. The Certificate of Eligibility (in duplicate) together with course information must be submitted to the Registrar's Office after registration at which time certification of enrollment will be forwarded to secure payment of benefits to the veteran.

Veterans transferring from another institution are required to complete the VA form "Request For Change of Program or Place of Training" and submit the completed form together with course information to the Registrar, who will forward their enrollment certification so that payment of benefits will be authorized while the veterans are attending Villanova.

Other new students (veterans) who register at Villanova without securing the Certificate of Eligibility in advance are required to complete the VA form "Application For Program of Education or Training" at registration. This completed application together with a copy of "DD Form 214" and course information will be forwarded to the VA by the Registrar so that authorization may be granted for benefits while attending Villanova.

Veterans' dependents who are eligible to receive monthly VA payments must report to the Registrar's Office (202 Tolentine Hall) at the beginning of each semester to inform the Registrar of their course information and student status.

Additional information on student affairs and student life can be found in the *Blue Book*.

ADMISSION

GENERAL POLICY ON ADMISSION

Villanova seeks to enroll students who excel academically and possess wide interests and positive qualities of character. In selecting members of the freshman class from the large number of candidates who meet the minimum quantitative and qualitative requirements, the University undertakes to admit those who appear best prepared to profit from the programs of study currently offered.

The criteria used to assess academic potential are: the scholastic record as reflected by courses chosen in high school and the quality of performance; rank in class (where rank is reported); scores earned on such nationally standardized tests as the SAT I and ACT; recommendations of teachers and counselors; participation in extracurricular and community service activities; and the student essay.

Students are selected wholly on the basis of individual merit. The University does not discriminate against applicants seeking admission because of their race, color, national or ethnic origin, religion, sex, age, physical disability, or family financial status. There are no quotas for any of the groups mentioned, but in selecting candidates whose academic qualifications are approximately equal, some preference may be given to children of alumni or faculty members, athletes, and to residents of geographical areas not strongly represented in the student body.

In conjunction with the State of Pennsylvania, Villanova University considers applicants from Pennsylvania for admission under its Act 101 (Academic Advancement Program). The purpose of the act is to provide an educational opportunity for students from Pennsylvania who meet the academic and economic criteria established

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by the Higher Education Opportunity Act of 1971, legislatively designated and publicly known as ACT 101. Interested and eligible applicants should note their desire to be considered for the Program on their application for admission.

REQUIRED AND ELECTIVE UNITS FOR ADMISSION

Although individual consideration is given to each applicant, it is expected that all applicants, except in most unusual circumstances, will satisfy the unit requirements listed below for the college to which they make application. As used here, a unit represents a year's work in any subject.

College of Liberal Arts and Sciences

For Arts and Education Curricula:

English	4	Mathematics	3
Foreign Language	2	Science	1
History or Social Science	2	Electives	3

For Science and Mathematical Sciences Curricula:

English	4	Foreign Language	2
Chemistry	1	Physics	1
Mathematics	4	Electives	4

College of Commerce and Finance

English	4	Science	1
History	2	Electives	5
Mathematics	4		

College of Engineering

English	4	Physics	1
Chemistry	1	Electives	6
Mathematics	4		

College of Nursing

English	4	Mathematics	3
History	2	Electives	2
Biology	1	Other Science	1
Chemistry	1	Foreign Language	2

Elective units acceptable in all colleges

Latin	2	Social Studies	2
Foreign Language	2	Mathematics	2
History	2	Laboratory Science	2
Chemistry	1	Botany	1
Biology	1	Zoology	1
Physics	1		

EARLY ACTION

Early Action admission is awarded to those exceptional students who have outstanding high school records and correspondingly high SAT I or ACT scores as judged by the Committee on Admission. Applicants will be evaluated on the basis of their three-year record and scores on the SAT I or ACT scores taken prior to December of the senior year.

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For Early Action, the completed application must be received by the Office of Undergraduate Admission no later than December 1st of the senior year. Early Action selectees will be notified January 15. These applicants need not apply only to Villanova. Unsuccessful applicants will also be notified, and will be included in the regular decision applicant pool.

REGULAR DECISION

Applicants for regular decision may file their credentials any time after the start of the senior year. The completed application must be received by the Office of Undergraduate Admission no later than January 15. Applicants for regular decision will be judged on the basis of their three or three-and-a-half-year high school record (to include senior mid-year grades) and their scores on the College Board SAT I or ACT taken by December of their senior year. All information in support of an applicant's candidacy for admission should be on file by January 15. Every effort will be made to notify all applicants by April 1 of the following appropriate action: acceptance, waiting list, denial, scholarship award, loan assistance, and/or grant-in-aid. Accepted students who have applied for on-campus residency must return a non-refundable \$400 deposit postmarked not later than May 1. Commuting students must return a non-refundable \$250 deposit postmarked not later than May 1. Notification of acceptance is made to commuting students and applicants to the College of Nursing on a rolling admission basis after January 15.

Students who are admitted and pay the \$400 deposit by May 1st are guaranteed three consecutive years (freshman, sophomore and junior) of on-campus housing.

APPLICATION PROCEDURE

To ensure proper processing of applications for admission, all candidates should follow the procedure outlined below:

- ? Obtain applications from the Office of Undergraduate Admissions, Villanova University, Villanova, PA 19085 (Toll Free 1-800-338-7927).
- ? Upon receiving the application, the candidate must complete it, enclose a non-refundable \$45 application fee, and forward it to the high school guidance counselor. *The application must be received by Villanova no later than January 15 for regular decision consideration.*
- ? Take the SAT I or ACT by December of the senior year and have the results sent to Villanova University (CEEB Code 2959).

Students accepting the University's offer of admission, including ROTC candidates, are advised to send their registration deposits by check or money order payable to "Villanova University" as soon as possible. *All deposits must be postmarked not later than May 1.* The deposit is non-refundable and is applied toward the student's first semester account. Incoming freshmen designated with residency status who accept an offer of admission by submitting deposits postmarked not later than May 1 are guaranteed on-campus housing for three consecutive years (freshman, sophomore and junior).

Candidates for Early Action follow application procedures as given above, except that:

- ? The completed application must be received by Villanova on or before December 1st.
- ? SAT I or ACT must be taken by November of the senior year and the results sent to Villanova University.

Information on admission requirements and procedures for Part-Time Studies can be found in the Part-Time Studies section of this *Catalog*.

TRANSFER STUDENTS

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Candidates for admission who have attended other colleges and universities should submit applications for transfer to the Office of Undergraduate Admission of Villanova University not later than July 15 for the fall and November 15 for the spring semesters.

The transfer applicant must submit complete transcripts of secondary school and college records, a list of courses in progress, a catalog describing courses completed at the college-level institution, evidence of honorable withdrawal (Transfer Applicant Evaluation), and any other information the Admission Committee may require.

Transfer credit towards undergraduate degrees will, in general, be granted for appropriate academic work completed with a grade "C" (2.0) or better at an accredited institution. Credit may be granted for courses without direct Villanova equivalents when such courses are of clear academic merit. In the College of Liberal Arts and Sciences a cumulative average of 3.00 and two semesters at the previous institution are prerequisites for acceptance. Quality-grade points for work taken elsewhere are not included in the calculation of the student's cumulative average used to determine advancement at Villanova and eligibility for graduation. The final thirty credits (senior year) of a degree program and at least half of all major courses must be taken at Villanova.

Candidates for admission from junior colleges, community colleges, or institutes are judged by the same regulations pertaining to applicants from four-year institutions. Credits will be granted, as above, for appropriate courses completed in a two-year program, provided that the institution is regionally accredited or a candidate for such accreditation. Transfer students from two-year programs should note that graduation after two years of study at Villanova cannot be guaranteed because of the complexities of scheduling and the fulfillment of the requirements of Villanova's program.

Applications for transfer of credit from non-accredited institutions are considered on an individual basis. Credit is granted for those courses that are of clear academic merit and in which the transfer applicant has earned grades. In all cases the University reserves the right to require a written examination in the course or courses in question before transfer credit will be granted. *NOTE:* Transfer students are eligible for campus residency on a space-available basis only.

PRE-MATRICULATED COLLEGE CREDIT STATEMENT

College-level work done prior to high school graduation may be awarded transfer credits upon receipt of the following: (1) an official letter from the high school principal or guidance counselor describing the college-level program of study; (2) an official letter from the college/university stating that the courses were taught on its campus by a member of the regular faculty, open to enrollment by and graded in competition with regularly matriculated undergraduates at the college, and a regular part of the normal curriculum published in the college catalog; and (3) an official, seal-bearing transcript from the college/university. Each supporting document is to be sent to the Dean of the College in which the student is enrolling.

INTERNATIONAL STUDENTS

Villanova University admits to its undergraduate program citizens from other countries who meet the appropriate criteria. International students are accepted to begin their studies in the Fall semester only. The final date for receipt of the application for undergraduate students is January 15.

To be considered for acceptance, international students must fulfill all the requirements of immigration, and achieve a minimum score of 550 on the Test of English as a Foreign Language (TOEFL).

All undergraduate international students should note that they must pay a non-refundable tuition deposit determined by the Office of Undergraduate Admission after acceptance and submit a certification of finances form prior to the issuance of the I-20 form. No need-based financial aid is available to international students from University sources. Also see the section above on International Students and Human Services.

ADVANCED PLACEMENT PROGRAMS

Villanova recognizes advanced placement from The College Board advanced placement program (AP) and from the International Baccalaureate Program (IB). Students who have taken these courses should report to their College Dean's office to verify Villanova's receipt of the scores, and to ensure that proper adjustments have been made to their academic records. The courses will be entered into the student's record with Villanova credit but

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without a grade. In some cases, the advanced placement course will allow the student to place out of a lower level course but will not be counted as credit.

The following AP courses will receive Villanova credit if a student receives a score of 4 or 5: American History (07); Art (14 or 15); Biology (20); Calculus (66 or 68); Chemistry (25); Computer Science (31 or 33); Economics (34 or 35); English (36 or 37); European History (43); French (48 or 51); German (55); Latin (60 or 61); Physics (80 or 82); Political Science (57 or 58); Spanish (87 or 89); Statistics (90). A grade of 3 or higher is awarded credit as follows: Arts and Sciences and Engineering, tests 31, 66, 68; Commerce and Finance test 68, Nursing, tests 07, 25, 31, 43, 66, 68, 80,82. Chemistry majors only receive credit for a score of 5 in test 25.

The following IB courses will receive Villanova credit if a student receives a score of 6 or 7: Anthropology; Biology; Chemistry; Computer Science H L; Computer Science Information Technology; French A; English; Economics; Geography; German A; History: Americas; History: Europe; Latin; Mathematics; Mathematics Further; Music; Philosophy; Physics; Psychology; Spanish A. Students also receive credit for a score of 5 in Computer Science H L, Computer Science Information Technology, English, Economics, Geography, and Mathematics Further.

CREDIT BY EXAMINATION

Qualified matriculated students may test out of selected courses and receive full credit for them. Such courses are graded on a “Satisfactory/Unsatisfactory” basis; however, a failing grade will not appear on the student's transcript. Applications and information are available in room 450, St. Augustine Center.

TRANSFER WITHIN THE UNIVERSITY

When a student transfers from one college to another within the University, the Dean may delete from the computation of the Grade Point Average courses which are not applicable to the new program. However, if such a student returns to her or his previous college, the Dean of that College will notify the Registrar to reinstate those courses. The grades and any credits earned will again be computed in the Grade Point Average.

TUITION AND FEES, 1998-99¹

UNDERGRADUATE COLLEGES AND PROGRAMS

TUITION (PER SEMESTER)

Program	Entering Freshmen (Fall 1999), Sophomores, Juniors	Seniors	Per credit hour for special students ²
Arts, Mathematics, Education	\$9,555	\$9,285	\$440
Commerce & Finance	\$10,045 (includes laptop computer), Juniors \$9,555	\$9,285	\$440
Nursing, Sciences	\$9,680	\$9,545	\$460
Engineering	\$10,005	\$9,735	\$495

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FEES

Application Fee (Non-refundable)	\$45
Tuition Deposit (Non-refundable)	\$400 (\$250 for commuters)
(Deposit due upon acceptance; credited to account upon registration)	
Orientation Fee (New Students only)	\$95
General University Fees	\$150/semester
Room (Depending on Accommodations)	\$1,750-2,560/semester
Board (Depending on Meal Plan)	\$1,550-1,830/semester
Late Registration Fee	\$25
Late Payment Fee	\$50
Returned Check Charge	\$25
Monthly Service fee for Past-due Accounts	\$5/month
Parking Fee (Annually for students using University parking lots)	\$75
Reinstatement fee ³	\$250

¹Subject to change at the discretion of the University Administration

²The per credit hour tuition rates apply to special students who have obtained permission to carry less than 12 credit hours:

³A reinstatement fee will be charged to students requesting reinstatement after being officially dropped for failure to complete requirements. Registration requirements include payment or making appropriate financial arrangements with the Bursar's Office. The student must register and is financially responsible for all courses for which he/she originally pre-registered. Other conditions may also apply.

Students may be billed for tuition and related costs up to the week before in-person registration. However, payments are due no later than the first day of class. This requirement applies to all students, including those who register too late to receive a bill. *Registration or the release of academic records cannot be completed until all financial obligations have been settled with the Bursar's Office.* In addition to the above expenses, students should include expenses for textbooks, laundry, clothing, personal effects, and travel between the University and their homes in their educational costs.

PART-TIME STUDIES

Application Fee (Non-refundable)	\$25
Tuition (Evening Courses Only)	
Arts, Commerce & Finance, Mathematics, Education	(per credit) \$290
Science, Nursing, Non-matriculated, Visitors, Post graduates	(per credit) \$300
Engineering	(per credit) \$415
Tuition (Day Courses Only 1-11 Credits) ¹	
Arts, Commerce & Finance Mathematics, Education	(per credit) \$440
Science, Nursing, Non-matriculated, Visitors, Post graduates	(per credit) \$460
Engineering	(per credit) \$495
General University Fee	Day \$150; Evening \$15
Late Registration Fee/Deferred Fee	\$25
Late Payment Fee	\$50
Reinstatement Fee ²	\$250
Monthly Services Fee for Past-Due Accounts	\$5
Returned Check Charge	\$25
Parking Fee ³	\$40

¹ Any student carrying 12 or more credits of all day classes or 12 or more credits of any combination of day/evening classes will be charged at the applicable full-time under graduate school rates. These rates are listed above.

² A reinstatement fee will be charged for students requesting reinstatement after being officially dropped for failure to complete registration requirements. Registration requirements include payment or making appropriate financial arrangements with the Bursar's Office. The student must register and is financially responsible for all courses for which he/she originally pre-registered. Other conditions may also apply.

³ Annually for evening students. For students taking day courses, the fee is \$75.

NOTE: Registration or the release of academic records cannot be completed until all financial obligations have been settled with the Bursar's Office.

FINANCIAL ASSISTANCE

The cost of a college education is a major concern facing parents and students. Villanova University recognizes this fact and attempts to provide a comprehensive package of financial assistance consisting of grants, loans, and student employment. In addition to these need-based programs, Villanova offers several merit-based scholarships which are granted irrespective of students' needs.

SCHOLARSHIPS

Presidential Scholarships

Villanova University offers four-year full-tuition Presidential Scholarships to every incoming class based exclusively on academic merit. The minimum criteria in order to be considered for these scholarships include a secondary school class cumulative rank in the top five per cent (if rank is reported), at the end of the 11th grade, a combined SAT I score of at least 1350 (650 minimum for both verbal and math), and a completed application received by the Office of Undergraduate Admission by December 1st. All applicants to the University who meet these criteria will be invited by the middle of January to submit an additional application for the scholarship. In attempting to identify those candidates most likely to make a special contribution to the Villanova community, the Committee bases its decisions on academic promise, demonstrated leadership, initiative, and communication skills. Selections are based exclusively on merit, without regard for race, religion, gender, financial need, or secondary school.

Villanova Scholarships

Partial tuition scholarships of \$12,500 per academic year are awarded through the Villanova Scholars program. The minimum criteria in order to be considered for these scholarships include a secondary school cumulative class rank in the top ten percent (if rank is reported), at the end of 11th grade, a combined SAT I score of 1300 (650 minimum for both verbal and math), and leadership skills demonstrated through high school and community involvement. Villanova Scholars awards must be used for tuition only.

Commuting Scholarships

Partial Scholarships of \$10,000 per academic year are awarded to outstanding students commuting from their parents' homes. To qualify for this award, students must score at least 1250 (550 minimum for both verbal and math) on the SAT I and must have a cumulative rank in the top 10% of their high school class (if rank is reported) at the end of the 11th grade. Commuting Scholars awards must be used for tuition only.

Presidential Scholarships for Under-represented Students

Each year, based on the recommendation of the Scholarship Committee, traditionally under-represented students are offered the Presidential Scholarship for Under-represented Students. These outstanding candidates

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must have exceptional high school credentials and must have scored a minimum of 1250 on the SAT I. This renewable award covers full tuition, fees, room and board charges for eight consecutive semesters.

STUDENT FINANCIAL AID

To apply for all types of student aid, prospective students must file the “Free Application for Federal Student Aid” (FAFSA) and the Villanova Financial Aid Application. The FAFSA can be obtained from the high school guidance counselor. To receive priority consideration for financial aid, applicants must file the FAFSA by February 15th. Signed copies of the student’s and parent’s prior year Federal Tax Returns and the Villanova Financial Aid Application must be submitted to the Office of Financial Assistance by March 15th.

All returning undergraduate students wishing to reapply for financial aid must file the “Renewal FAFSA” that is mailed to the student’s home address on file at the Federal Central Processor. Returning students who are new financial aid applications must file an original FAFSA. Applicants who are not Pennsylvania residents should file the appropriate application for State Grant consideration in their home state. All returning students must also complete the Villanova Financial Aid Application and return it to the Office of Financial Assistance (Kennedy Hall, second floor) with signed copies of prior year Federal Tax Returns for both student and parents by April 15. *Late applications will be aided only if funds remain available.*

In addition to assistance from federal and state sources, students attending Villanova University may be considered for aid administered by the university which is provided through the generosity of individuals and organizations. Students and parents are invited to obtain a complete list of privately funded sources and their selection criteria from the Office of Financial Assistance.

Villanova University believes the primary responsibility for meeting educational expenses belongs to both the parents and the student. However, Villanova is committed to help meet the needs of families whom the federal need analysis determines cannot afford the full cost of a Villanova education with fair and equitable financial aid packages from the following federal, state, private, and university sources:

Villanova University Grant

This is an institutional grant based on financial need. Students must be accepted/enrolled in a full time undergraduate degree program. All Villanova students must apply for need-based financial aid to be considered for this program. This award cannot be applied to expenses incurred for courses taken outside Villanova University.

Federal Pell Grant Program

This is a federal grant for students demonstrating exceptional financial need and accepted/enrolled in an undergraduate degree program. Application for Federal Pell Grants may be made by submitting an initial FAFSA or a Renewal FAFSA.

Federal Supplemental Educational Opportunity grant (SEOG)

This is a federal grant administered by the educational institution based on financial need. Only undergraduate degree candidates are eligible. All Villanova students must complete the VU application and an initial FAFSA or the Renewal FAFSA to be considered for this program.

Federal Perkins Loan

This is a federal loan based on financial need for students accepted/enrolled in an undergraduate or graduate degree program. All Villanova students must complete the VU application and an initial FAFSA or the Renewal FAFSA to be considered for this loan program. The Perkins Loan is a 5% interest loan and becomes payable nine months after leaving the University, or nine months after the student is no longer enrolled at least half time. Entrance and exit interviews are required by federal law. A hold may be placed on a student’s transcript if the student does not appear for the exit interview or complete and sign all documents. No credits will be placed in the student’s account in the Bursar’s office until all documents, including promissory note, have been completed by the student borrower and returned to the Office of Financial Assistance.

Federal Work Study (FWS)

Federal employment program based on financial need for students who are accepted/enrolled in either an undergraduate or graduate degree program. All students must complete the VU application and an initial FAFSA or the Renewal FAFSA to be considered for this program. Students are given the choice to work on or off campus with salaries ranging from \$4.50 to \$6.75 per hour according to job description. Students receiving work-study awards are limited to earning the amount of their initial allocation. Once that limit has been reached, students should contact a Financial Assistance counselor concerning further work study employment. Current work study job listings are posted in the Office of Financial Assistance.

PHEAA Grant

A Pennsylvania State Grant based on financial need for students who qualify for state residence and who are accepted/enrolled in an undergraduate program and enroll for at least six credits each semester. For State Grant consideration, students are required to file either an initial FAFSA or a Renewal FAFSA.

Other State Grants

Certain states allow residents to take their state grants into Pennsylvania for study at Villanova. Students are responsible for checking with the respective State Higher Educational Agencies as to the correct application necessary for state grant consideration.

Outside Awards

Organizations outside Villanova University may provide scholarships or financial assistance to Villanova students. Students are responsible for consulting the individual organization for the proper applications and deadlines and for sending transcripts to the scholarship committee if required. *NOTE:* State, federal, and University regulations prohibit “over” awards. All outside scholarships, whether based on academic merit or financial need, will be counted as a source of aid and will be added to the student’s total aid package. This may result in a reduction of a Villanova Grant or federal aid. It is the student’s responsibility to notify the Office of Financial Assistance concerning any outside aid received.

Any change in a student’s financial or academic status may result in an adjustment to his or her aid. The Office of Financial Assistance retains the right to make any necessary changes.

Federal Stafford Student Loan Program

An educational loan available to students accepted/enrolled on at least a half time basis in an undergraduate degree program. Students must pick up applications from their lender or State Higher Education Assistance Agency. They must also file the VU application and an initial FAFSA or the Renewal FAFSA. Eligibility for a Federal Stafford Loan is based on cost of education, amount of other financial aid being received, as well as an expected family contribution towards educational costs. Repayment begins 6 months after the student leaves the University or is no longer enrolled at least half time. The student has up to 10 years to repay. The interest rate will be determined by the date of the student’s FIRST student loan. Disbursement will be made either through the issuance of check or electronic fund transfer (EFT). The loan check is made payable to BOTH the student and the school and will be forwarded to the school in two equal disbursements. A guaranty fee and/or an origination fee is charged on each loan. The maximum loan amount per year is \$2,625 for freshmen, \$3,500 for sophomores, and \$5,500 for juniors and seniors. Funds to be delivered via EFT will be directly deposited into the student’s billing account.

Federal Unsubsidized Federal Stafford Loan

The enactment of the federal “Higher Education Amendments of 1992” has resulted in the establishment of an unsubsidized Federal Stafford Loan program for students who are not eligible based on need or have limited eligibility for the subsidized Federal Stafford Loan. In this program students may borrow under the same terms as the federally subsidized Stafford Loan program with one exception: the government does not pay the interest

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on an unsubsidized loan. The student pays all interest that accrues on this loan during the time of enrollment, grace period and repayment.

Federal Parents' Loan for Undergraduate Students (PLUS)

Effective July 1, 1993, parents of dependent undergraduate students may be eligible to borrow up to Villanova's cost of education minus estimated financial assistance. Eligibility for this loan is based on creditworthiness and the interest rate is variable but will not exceed 9% interest and principal payments are monthly. Applications can be obtained from one's bank or lending institution. A Villanova University Application must also be completed. *NOTE:* For important information concerning aid payments and student rights and responsibilities, contact the Office of Financial Assistance.

MINIMUM STANDARDS FOR SATISFACTORY ACADEMIC PROGRESS FOR FINANCIAL AID APPLICANTS

Federal regulations require that an institution establish, publish, and apply reasonable standards for measuring whether a student, who is otherwise eligible for aid, is maintaining satisfactory academic progress in his or her course of study. The standards must be the same or stricter than the institution's standards for a student enrolled in the same academic program who is not receiving financial aid assistance. Listed below is the complete statement of Minimum Standards for Satisfactory Academic Progress for Financial Aid Recipients.

Villanova University Academic Maximum Time Frames for Completing Degree Requirements:

Students are expected to complete their program of study (degree) in the number of semesters indicated in the catalog. Transfer students and students changing programs are placed in an appropriate semester on the basis of credits transferred. Such students are expected to complete their degree according to the remaining semesters in their program plus one additional semester to allow for scheduling difficulties.

The maximum time frame for completing Associate degree requirements is three years for full-time students and six years for part-time students.

The maximum time frame for completing Baccalaureate degree requirements is six years for full time students and twelve years for part time students. Transfer credits earned at other institutions that are applicable to the student's program of study will be considered in determining the student's maximum time frame for program completion.

Students must make quantitative and qualitative progress toward their educational goals *each academic year* to receive financial aid. The academic year consists of two regular semesters and the summer sessions.

Quantitative Standards

Full time students must successfully complete a minimum of 24 credit hours each academic year. Students admitted in January must successfully complete a minimum of 12 credits during their first Spring semester.

Students enrolled on a three-quarter basis (9-11 credits per semester) must successfully complete a minimum of 18 credit hours each academic year.

Students enrolled on a half-time basis (6-8 credits per semester) must successfully complete a minimum of 12 credit hours each academic year.

Qualitative Standards

Students must maintain a Cumulative Grade Point Average (GPA) of 2.0 calculated at the end of the academic year in order to be considered a student in good standing.

Measurement of Academic Progress Requirements

Academic progress will be measured in May of each year. Measurement begins with the Fall semester and ends with the last summer session. Students who were enrolled during the Fall and/or Spring semesters and failed to meet the qualitative and quantitative requirements for academic progress can attempt to complete additional

credits and bring up their GPA during the summer sessions. Upon completion of the additional credits, a new determination of academic progress will be made.

Transfer students are evaluated for academic progress in May, after the first Spring semester attended at Villanova University. Students that transfer in for the Fall semester are evaluated on their academic performance during their first Fall and Spring semesters. Students that transfer in beginning with the Spring semester are evaluated on their performance during their first Spring semester.

All financial aid applicants are subject to the Satisfactory Academic Standards regardless of whether or not they received financial aid previously.

Failures and withdrawals are courses attempted, not completed. Incompletes are not counted toward credits completed until after the coursework is successfully completed and posted by the Registrar. Repeat courses will not count toward credits completed for satisfactory academic progress since the credits were already counted toward the quantitative standards the first time the course was completed.

When Minimum Standards of Academic Progress Are Not Achieved

A student who does not make satisfactory academic progress will be placed on financial aid suspension until the requirements are met. The student will be notified in writing of the financial aid suspension.

The student can appeal the decision to the Office of Financial Assistance. The appeal must be submitted in writing and specify the extenuating circumstances which prevented achieving satisfactory academic progress.

The following types of mitigating circumstances may be considered when a student appeals: extended illness, death in the family, and changes in educational objective. The Office of Financial Assistance may request additional documentation and/or require a personal interview with the student. After the review, the Office of Financial Assistance will notify the student in writing of the action taken.

If the Office of Financial Assistance determines that the Academic Progress Standards can be waived for one semester, the student will be placed on Financial Aid Probation. At the end of the probationary semester, the Office of Financial Assistance will determine if academic progress requirements have been met. If requirements have been met, the probationary status will be removed. If academic requirements have not been met, the student will be placed on financial aid suspension.

Once financial aid has been discontinued, it will be reinstated provided:

- ? The student has successfully achieved the required number of credits and grade point average;
- ? The student has requested reinstatement in writing; and
- ? Funds are still available.

Reinstatement is not automatic. The student is responsible for making certain that the grades and credits completed have been properly posted with the Registrar prior to requesting reinstatement of financial aid. Students are encouraged to file all financial aid application forms by Villanova University's established deadline so that once reinstatement has been achieved, he or she can be considered for aid as quickly as possible.

A student who is denied aid based on qualitative or quantitative standards will be considered for aid when standards have been achieved. Under no circumstances will aid be awarded retroactively to the semester(s) in which standards were not met.

INSTITUTIONAL REFUNDS TO TITLE IV PROGRAMS

Refunds as a result of official withdrawal or leave of absence will be made in accordance with Villanova's refund policies which appear in the Undergraduate Regulations section of this Catalog.

If a student is entitled to a refund and has received Title IV aid (except a Federal Work Study award), a portion of the refund shall be returned to the Title IV assistance program(s) in accordance with regulations governing the administration of the program(s).

In accordance with the Higher Education Amendments of 1992, Villanova University has instituted *pro rata* refund policy for students who are in their first semester of study and are recipients of Federal Title IV financial assistance. This federal aid includes Pell and Supplemental Educational Opportunity Grants, Perkins Student Loan,

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Federal Stafford Loan as well as the Parents' Loan for Undergraduate Students (PLUS). *Pro rata* refunds are extended to those who qualify and who officially withdraw prior to the tenth week of class.

Refunds as a result of official withdrawal will be made according to the schedule listed below. Activities, library, and medical fees are not refundable. There will be no refund for unauthorized withdrawals. Students who do not register or who notify the Registrar's Office prior to the first week of class that they will not enroll are entitled to a full refund.

Segment of Semester	Refund
Up to first week	80%
Up to second week	60%
Up to third week	40%
Up to fourth week	20%
Beyond fourth week	No refund

In accordance with current federal regulations governing the administration of Title IV financial aid, Villanova University has instituted a refund policy for all students not included in the Pro Rata Refund provisions who are recipients of Federal Title IV financial assistance. This aid includes the Federal Pell and Federal Supplemental Educational Opportunity Grants, Federal Perkins Student Loan, Federal Stafford Loan, and the Federal Parent Loan for Undergraduate Students. This refund policy extends to those who officially withdraw prior to the ninth week of class.

Refunds as a result of official withdrawal will be made according to the following schedule. Excluded from the refund calculation will be the costs related to on-campus housing and University meal plans. Activity, library, and medical fees are not refundable. There will be no refund for unauthorized withdrawals. Students who do not register or who notify the Registrar's Office prior to the first day of class that they will not enroll are entitled to a full refund.

Segment of Semester	Refund
Before the third week	90%
Between the third and fourth weeks	50%
Between the fourth and eighth weeks	25%
Beyond the eighth week	No refund

CITIZENS AND ELIGIBLE NON-CITIZENS

In order to receive financial assistance, a student must be a U.S. Citizen, a U.S. National, a U.S. permanent resident who has an I-151 or I-551 Alien Registration Card, or an otherwise eligible non-citizen with a temporary resident card (I-688); or must possess one of the following:

- ? A Form I-94 (Arrival-Departure Record) with an appropriate endorsement;
- ? A Form I-181 or I-181B that has been signed by an INS district director;
- ? An official statement granting asylum in the US: or
- ? Other proof from the U.S. Immigration and Naturalization Service that one is in the U.S. for other than a temporary purpose.

Students should check with the Financial Assistance administrator at Villanova to see what documents are required. Students in the U.S. on an F1 or F2 student visa only, or on a J1 or J2 exchange visitor visa only, may not receive student aid, nor can those who possess only a notice of approval to apply for *permanent residence* (I-171 or I-464A). *NOTE:* All eligible non-citizens must present their Alien Registration cards in person to the Office of Financial Assistance for verification.

Verification

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Verification is a requirement of the U.S. Department of Education and is the process of confirming information submitted on the various Federal Title IV Funds including the Federal Stafford Loan. Applicants should be aware that this federal regulation requires them to submit tax data and other requested information to the Office of Financial Assistance before the processing of student loan applications and/or the awarding of funds. Students must submit the required information to complete the verification process no later than 45 days before the last day of the student's enrollment.

Items to be verified include: adjusted gross income from the IRS form; U.S. income taxes paid; number of family members for whom parents provide more than half of their support; the number of children in post secondary schools who are enrolled at least half time; dependency status; untaxed income; eligible non-citizen status and any other item for which conflicting information has been submitted to the Office of Financial Assistance.

Documents Required

- ? (For dependent students): signed copies of parents' and student's U.S. income tax returns, including all schedules, from the prior year.
- ? (For independent students): signed copy of the student's (and spouse's if applicable) prior year U.S. income tax return.
- ? A signed Statement of Educational Purpose/Selective Service Registration Compliance form must be submitted.
- ? If the student or parent did not file taxes, a signed non-tax filer statement and copies of all W-2 forms must be submitted. Non-taxable income verification such as VA Benefits, Social Security and Public Assistance Letters must be submitted to the Office of Financial Assistance.

ACADEMIC POLICIES

The following policies and regulations, along with those of the individual colleges and programs, govern academic life at the University. In order that the programs offered reflect current advances in and additions to knowledge and changes in professional requirements, the University and each of its colleges reserves the right to change program requirements without prior notice. Unless otherwise specified, students are bound by the policies and regulations in effect when their entering class begins its first year of study. *It is the responsibility of the student to know and comply with the academic policies and regulations of the University and their respective colleges.* Students should consult the individual college sections of this *Catalog* and the special publications and guidelines issued by the colleges and departments.

ACADEMIC STANDING

Quality Point Averages

In addition to passing all courses taken the student is also required to maintain a specified grade average leading to graduation with a college degree. The average is derived from the grades and credit hours of the courses taken and is known as the quality-point average. It is determined by multiplying the number of credits for each course attempted by the allotted quality points for the grades received and dividing the total quality points by the total credit hours attempted. Quality points for grades are as follows: A=4.00; A-=3.67; B+=3.33; B=3.00; B-=2.67; C+=2.33; C=2.00; C-=1.67; D+=1.33; D=1.00; D-=.67.

Class Rank

A student's rank in class is determined by the cumulative quality-point average, which is computed each semester. Only credits earned with Villanova University or in formally approved inter-institutional programs will

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be considered in determining the cumulative quality-point average. Credits and grades earned in the summer at other colleges are not counted in the quality point average.

Academic Progress

To qualify for a bachelor's degree, a student, in addition to completing all the studies prescribed for the degree sought, must earn a cumulative quality-point average of at least 2.00.

In circumstances involving those students who have entered Villanova University through the Academic Advancement Program, satisfactory progress of the student will be determined by the Academic Standing Committee and/or Dean of the college in which the student is matriculated. In the event that, due to poor high school preparation, additional time is necessary for the student to complete the requirements towards graduation, the student will be viewed as being in a five year program. Satisfactory progress will be viewed accordingly.

Academic Probation

The record of any student whose cumulative or semester quality-point average falls below 2.00 will be reviewed by the Academic Standing Committee for appropriate action. Students in science or engineering whose technical course quality-point average falls below 2.00 will also come before the committee (technical courses include all science, mathematics and engineering courses). Typically the student will either be placed on academic probation or dismissed.

A student on academic probation will normally be allowed only one semester to achieve the required quality-point average. While on academic probation, the student is limited to a schedule of five courses and is ineligible to participate in any extracurricular activities. In the College of Liberal Arts and Sciences a student on probation is limited to a schedule of four courses.

Honors

At graduation students receive honors of three kinds -- *summa cum laude*, *magna cum laude*, and *cum laude* -- after being approved for such honors by the faculty and administration of the University. To be eligible for these honors, students must attain a minimum cumulative quality-point average of 3.90, 3.75, 3.50, respectively, and at least sixty credits of course work (not including Satisfactory/Unsatisfactory courses) must have been taken at Villanova University.

Repeat Freshman Year

The Academic Standing Committee may allow a freshman student to declare academic bankruptcy and repeat the year with a new start on the cumulative average (though a record of the year's work will remain on the transcript).

COMPLAINTS ABOUT FACULTY AND GRADES

Villanova University has a set of procedures for resolving student complaints about faculty performance or about grades. A student who has concerns about either of these issues should, if at all possible, discuss the problem directly with the faculty member. If this is not possible, the student should contact the faculty member's department chair or program director who will provide the student with a copy of the procedures and, if the student wishes, review the process involved. If the student is, for good reason, reluctant to contact the department chair, the student may also contact the Dean of the faculty member's college. A copy of the procedures is also available on request from the Academic Affairs Office, 103 Tolentine Hall, (519-4520).

CLASS ATTENDANCE

Class and laboratory **attendance for first year students is mandatory** with the following exceptions: approved athletic participation, approved field trips, certified serious illness, death in the immediate family, or approved placement activities. An absence card, available from the Office of the Dean of the student's college, must be completed and presented to the Dean no later than 4:30 p.m. on the day the student returns to classes. Excused

absences allow the student to make up tests and do not count toward a failure in the course. Absence from class does not release the student from work assigned.

A first-year student will receive a grade of “XF” (failure) whenever the number of unexcused absences in a course exceeds twice the number of weekly class meetings for the course.

For students beyond the first year, attendance policies are determined by the instructors of the various courses. Enforcement of such attendance policies lies with those instructors. Of course, it always is a courtesy to inform one’s professors about any absence.

COURSE NUMBERING

Courses of instruction are numbered according to the following system: courses designated 1000-6999 are given for undergraduate students only; courses numbered 7000-7999 are graduate courses ordinarily open to qualified undergraduates; courses numbered 8000-9999 are graduate courses not ordinarily open to undergraduates.

If a qualified senior wishes to enroll in a graduate course, written approval must be obtained from the student’s adviser and undergraduate college Dean. The College of Liberal Arts and Sciences requires, in addition, approval of the instructor and departmental chairperson of the course involved.

DISCIPLINE AND ACADEMIC INTEGRITY

Academic honesty and integrity lies at the heart of the values expressed in the University’s mission statement and inspired by the spirit of Saint Augustine. When one comes to Villanova, one joins an academic community founded on the search for knowledge in an atmosphere of cooperation and trust. The intellectual health of the community depends on this trust and draws nourishment from the integrity and mutual respect of each of its members.

Villanova University has a formal code of academic integrity which discusses issues such as plagiarism and other unacceptable academic behaviors. This document is distributed to each student and is available in many of the college manuals. It is the responsibility of every student to be familiar with this code and to adhere to it. A student who violates the academic integrity code in a course will receive an F for the assignment or a more severe penalty up to an F for the course. In addition, the student will be expected to complete an educational program, supervised by the student’s college dean, to help the student come to a fuller understanding of academic integrity. For the second offense, the student will be dismissed from the University and a record of the reason for dismissal will be retained in the student’s permanent file and will appear on the student’s official transcript. A student who commits an academic integrity violation outside of a specific course will receive a penalty determined by the dean of the student’s college.

Students who receive an academic integrity penalty may, if they believe that they have not committed an academic integrity violation, take their case to the Board of Academic Integrity. Detailed descriptions of the University’s Academic Integrity Policy are available from department chairs and deans.

In keeping with its nature and goals as a private, church-related institution, Villanova University regards student life on campus as an integral part of the student’s educational experience. Hence it is to be understood that the student, in joining the University community, accepts the regulations promulgated in the *Student Handbook*. The student should also become acquainted with and understand the responsibilities set forth in the *Student Handbook*, especially those in the sections on *Policy and Regulations*. Adherence to University regulations is expected and required for successful completion of the program of studies. Enforcement within the classroom of regulations regarding smoking, proper classroom attire, deportment, etc., is the responsibility of the faculty member.

DISCLOSURE OF STUDENT RECORDS

Villanova University, in accordance with the Family Educational Rights and Privacy Act (FERPA) of 1974, also known as the Buckley Amendment, permits its students to inspect their records whenever appropriate, and to challenge specific parts of them when they feel it is necessary to do so. Printed below are the specific guidelines and procedures which are to be followed:

Public Records

Information concerning the following items about individual students is public and may be released or published without the student's consent: full name; address; telephone number; date and place of birth; major field of study; dates of attendance; degrees and awards received; most recent previous educational institution attended; participation in officially recognized University activities, student organizations, and athletics; and weight and height of members of athletic teams. *NOTE:* students who do not wish such information to be released or made public, may inform the appropriate office in writing at the time the information is originally sought from students.

Confidential Records

All personally identifiable information related to particular students used to make decisions about students or for transmittal to others outside the University other than public records is considered confidential information. This information includes, but is not necessarily limited to: academic evaluations; general counseling and advising records; disciplinary records; financial aid records; letters of recommendation; medical or health records; clinical counseling and psychiatric records; transcripts, test scores, and other academic records; and cooperative work records.

A currently or previously enrolled student has the right to inspect and review official records, files, and data directly related to the student as an individual student. This right does not extend to applicants, those denied admission, or those admitted who do not enroll. Offices may require that requests for access be submitted in writing, and may ask for, but not require, the reason for the request.

Official records, files, and data to which students are entitled to access do not include:

- ? Letters of recommendation or statements of reference for students obtained or prepared before January 1, 1975, pursuant to implied or expressed promises of confidentiality or letters of recommendation or statements of recommendation to which students have waived the right of access.
- ? Employment records of students as University employees.
- ? Campus law enforcement records held in the Campus Security Office.
- ? Clinical, medical counseling, or psychiatric records (these records or copies thereof may be reviewed by a physician or other appropriate professional of the student's choice).
- ? Financial records of the parents of the student or any information contained therein.
- ? Private records kept by individual faculty or administrators possibly used as memory aids unless intended for transmittal to others.
- ? Institutional records of students which may be maintained by the University in a computer printout or similar format (so long as this computerized information is not intended to be distributed outside the University), as long as the original source of computer information is available in the office or department having original jurisdiction for the records.
- ? Records which contain only information relating to a person after that person was no longer a student at the University (e.g., information collected by the University pertaining to accomplishments of its alumni).

A student is entitled upon reasonable request to an explanation of any information contained in official records directly related to the student. The student has the opportunity for a hearing to challenge the content of such records to ensure that they are not inaccurate or misleading, or otherwise in violation of privacy or other rights; to correct or delete any such inaccurate, misleading, or otherwise inappropriate data; or to insert into the records a written explanation.

The substantive judgment of a faculty member about a student's work (grades or other evaluations of work assigned) is not within the scope of such hearings. A student may challenge the factual and objective elements of the content of student records but not the qualitative and subjective elements of grading.

Should a student object to items included in his or her personal records, s/he should discuss the objection with the individual responsible for the office where the student record is maintained. If the results are not satisfactory, the student should raise the issue with the individual to whom that person reports. If still unsatisfied, the student may take the case to the appropriate vice-president or designee. The final level of appeal is a formal hearing; to obtain such a hearing, the student should file a written request with the Vice President for Student Life. The hearing will be conducted in accordance with the requirements of the Family Educational Rights and Privacy Act.

Students may be invited but not required to waive their right of access to confidential letters of recommendation for admission, honors or awards, or career planning and placement. Students will suffer no prejudice in admission, financial aid, or other University services by reason of not executing the waiver. If the waiver is signed, the applicant may request a list of all persons making confidential recommendations or statements.

Third parties do not have access to personally identifiable records or information pertaining to students as students without the written consent of the student specifying the records to be released and to whom the records are to be released. Excepted from this restriction are:

- ? University officials who require access on an internal need-to-know basis for legitimate educational purposes such as academic, disciplinary, health or safety matters. University officials may include, without limitation, the President, Vice Presidents, Deans, Directors, Department Chairs, Faculty Members, General Counsel, Judicial Officers, Counselors, Resident Advisers, Coaches and Admissions Officers.
- ? Students in their official capacity as file clerks working in University offices.
- ? Disclosure of appropriate academic records to officials of other educational institutions to which the student seeks or intends to enroll (on condition that the student upon request is entitled to a copy of such records).
- ? Records released pursuant to judicial order (on condition that an effort is made to notify the student of the subpoena).
- ? Records released in connection with the student's application for, or receipt of financial aid.
- ? Appropriate federal and state officials or authorities consistent with federal regulations.
- ? Organizations conducting studies for, or on behalf of, educational agencies or institutions.
- ? Accrediting organizations in order to carry out their accrediting functions.
- ? Parents of a dependent student as defined in section 152 of the Internal Revenue Code of 1954.

In case of an emergency, the University may release personal information to protect the health and safety of students. This policy does not preclude any access to student records by authorized federal or state officials in connection with the audit and evaluation of federally supported education programs or in connection with the enforcement of federal legal requirements which relate to such programs. *NOTE: Confidential information is transferred to a third party only on the condition that such party is informed that he or she may not permit any other party to have access to such information without the written consent of the student.*

FINAL EXAMINATIONS AND CONFLICT

Final examinations are given in virtually all courses at a time and place designated. *NOTE: It is the student's responsibility to contact the professor within 48 hours if an examination is missed.* Provisions exist to alleviate scheduling problems caused by conflicts, i.e., if two of a student's examinations are scheduled at the same time or if three of his/her examinations are scheduled on the same day.

In the event of a conflict, the student must request in advance that a special examination be given by one of the instructors in accordance with the following directions.

1. Group departmental examinations should take precedence over any other.
2. Major or required courses should take precedence over electives.
3. A regular course should take precedence over a repeat or make-up course.

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Extraordinary difficulties encountered in effecting such an arrangement will be resolved by the Dean of the respective college.

GRADING SYSTEM

At mid-semester and at the end of the semester grades are mailed to the student. The grade report at the end of the semester is part of the student's permanent record. Any inaccuracy on this record must be reported to the Registrar within two weeks of its receipt; otherwise, the record will stand as it is.

Grade Definitions

- A is the highest academic grade possible; an honor grade which is not automatically given to a student who ranks highest in the course, but is reserved for accomplishment that is truly distinctive and demonstrably outstanding. It represents a superior mastery of course material and is a grade that demands a very high degree of understanding as well as originality or creativity as appropriate to the nature of the course. The grade indicates that the student works independently with unusual effectiveness and often takes the initiative in seeking new knowledge outside the formal confines of the course.
- A-
B+
- B is a grade that denotes achievement considerably above acceptable standards. Good mastery of course material is evident and student performance demonstrates a high degree of originality, creativity, or both. The grade indicates that the student works well independently and often demonstrates initiative. Analysis, synthesis, and critical expression, oral or written, are considerably above average.
- B-
C+
- C indicates a satisfactory degree of attainment and is the acceptable standard for graduation from college. It is the grade that may be expected of a student of average ability who gives to the work a reasonable amount of time and effort. This grade implies familiarity with the content of the course and acceptable mastery of course material; it implies that the student displays some evidence of originality and/or creativity, and works independently at an acceptable level and completes all requirements in the course.
- C-
D+
- D denotes a limited understanding of the subject matter, meeting only the minimum requirements for passing the course. It signifies work which in quality and/or quantity falls below the average acceptable standard for the course. Performance is deficient in analysis, synthesis, and critical expression; there is little evidence of originality, creativity, or both.
- D-
- F indicates inadequate or unsatisfactory attainment, serious deficiency in understanding of course material, and/or failure to complete requirements of the course.
- N Incomplete: course work not completed.
S Satisfactory: Assigned in Satisfactory/Unsatisfactory courses.
SP Satisfactory Progress.
U Unsatisfactory. Assigned in Satisfactory/Unsatisfactory courses.
WX Approved withdrawal without penalty.
W Approved withdrawal with penalty.
AU Audit.
Y Unofficial withdrawal from course (or for freshmen, failure for excessive absences).
NG (Or Blank): no grade reported.

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All grades are permanent, except N and NG, which are temporary grades used to indicate that the student's work in a course has not been completed. An N or NG grade must be removed and a grade substituted by the instructor according to the following schedule:

For the Fall Semester: Students must submit all work to the instructor by the last Friday in January; grade changes must be submitted to the Registrar's Office by the second Friday in February

For the Spring Semester: Students must submit all work to the instructor by the last Friday in June; grade changes must be submitted to the Registrar's Office by the second Friday in July

Students should check the academic calendar for actual dates. *NOTE: if a change is not reported, the N or NG grade automatically becomes an NF.*

Without the approval of the instructor, the department chairperson, and the Dean, no grade higher than C may replace the N.

A student may also receive an N for missing a final examination if the student reports a serious medical reason (or other reason certified by the Dean as acceptable) within 48 hours of the time of the examination. Otherwise an F grade must be reported. The student may report the reason for absence to the instructor, the department chair, or the Dean.

The grade WX indicates an authorized withdrawal with the grade not considered in the calculation of the quality-point average. The grade W also indicates an authorized withdrawal, but the grade is calculated as an F in determining the quality-point average. Authorization for WX and W may be given only by the student's Dean. The grade Y is given when a student unofficially withdraws from a course. It is reflected in the average as an F.

Required courses carrying a final grade of F must be repeated unless the student transfers to another college of the University where the course for which an F grade was received is not a requirement for the degree. The reasons for student deficiencies are reported by the faculty member at mid-semester and at the end of the semester to the Dean of the student's college.

When a student who has failed in a course presents evidence of subsequently passing a like course in another institution, the University reserves the right to withhold credit for the course until the student shall have passed a qualifying examination given by the Faculty from which a degree is sought.

Students should recognize that failure in one course or more will usually make it impossible for them to graduate with the class in which they matriculated.

Audit

Courses may be audited with an adviser's consent. The student who has been granted audit status will not be responsible for the assignments and examinations required in the course, but must attend all class and laboratory sessions. Although no credit or grade is received, the same tuition and fees are charged for an audit as for a credit course. A student must declare audit status by completing the appropriate form in the Registrar's Office by the end of the drop/add period, and no change from credit to audit status or *vice versa* may be made after that period.

A class taken for audit may subsequently be taken for credit, but the student will be charged normal tuition and fees for the course.

Satisfactory/Unsatisfactory Option

For the regulations governing students eligible for the satisfactory/unsatisfactory option in the different colleges and the courses that may be required, see the appropriate section of the catalog in which the college degree programs are listed. The following regulations apply to all colleges:

- ? The satisfactory/unsatisfactory grade will be shown on the transcript but will not be reflected in the quality-point average.

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- ? Failures in the satisfactory/unsatisfactory option need not be repeated.
- ? The grade S is the grade C or better.
- ? A student must declare election of the satisfactory/unsatisfactory option by the end of the drop/add period.

RESIDENCE REQUIREMENT FOR GRADUATION

A student must complete the final 30 credit hours of an academic program at Villanova.

SCHOLASTIC LOAD

A student must take a minimum of 12 credits a semester to be a full-time student. A normal scholastic load is defined by the program set forth in this catalog. Permission to take fewer than 12 credit hours or a course in excess of the normal load may be obtained in exceptional circumstances with the written approval of the Dean. All colleges require a 3.5 QPA (Engineering 3.00) for a student to be granted an overload.

TRANSCRIPTS

Students may obtain transcripts of their records from the Office of the Registrar, Tolentine 202, either in person or by writing to the office. Telephone requests cannot be accepted. Two weeks notice is required.

Official transcripts bear the seal of the University and the signature of the Registrar. Those given or mailed to the student, are stamped with a statement which points out this fact.

Transcripts will not be released for persons whose financial accounts are not clear in the Bursar Office.

WITHDRAWAL FROM A COURSE

Until the final day for authorized withdrawal from courses (the Friday following mid-term break), a student may withdraw from a course without penalty and will receive the grade of "WX." After that date, a student seeking authorized withdrawal without penalty must petition the Dean of his or her college, who has sole authority to grant withdrawals without penalty. Each college has different requirements, which may be found under "Withdrawal from a Course" in each college's section of this *Catalog*. Note that withdrawals without permission will receive a "W" grade, which is calculated as an "F" in computing one's quality point average.

WITHDRAWAL FROM THE UNIVERSITY

Official withdrawal from the University must be authorized by the Dean of the appropriate college. In order to effect an official withdrawal, a student must submit to the Dean a formal letter, or the appropriate college form, and then have an interview with the Dean. The letter of withdrawal may be countersigned by the student's parents or legal guardian. The parents or guardians may, if they wish and if authorized by the student, submit the official letter of withdrawal. Applications for withdrawal must usually be made by the end of the fourth week of school.

COLLEGE OF LIBERAL ARTS AND SCIENCES

Rev. Kail C. Ellis, O.S.A., Ph.D., Dean
Robert DeVos, Ph.D., Assistant Dean
John A. Doody, Ph.D., Assistant Dean
Ben W. Summers, M.S., Assistant Dean
Barbara E. Wall, O.P., Ph.D., Assistant Dean

“Set love as the criterion of all that you say,
and whatever you teach, teach in such a way that the
person to whom you speak, by hearing may believe,
by believing hope, and by hoping love.”

THE INSTRUCTION OF BEGINNERS by St. Augustine

HISTORY

The College of Liberal Arts and Sciences of Villanova University was founded by the Augustinian Order in 1842. The College traces its origins to old St. Augustine's Church in Philadelphia, which the Augustinians founded in 1796, and to its parish school, St. Augustine's Academy, established in 1811.

In 1842, the Augustinians purchased "Belle Air", the country estate of John Rudolph, a Revolutionary War officer and Philadelphia merchant. There, they established the "Augustinian College of Villanova", under the patronage of St. Thomas of Villanova, a sixteenth-century Augustinian educator and Bishop of Valencia, Spain. Eventually the College came to be known as Villanova and gave its name to the town which grew up around it.

Classes for the new College began on September 18, 1843, when thirteen students embarked on a traditional liberal arts curriculum. At the outset, however, difficulties plagued the new College. The anti-Catholic "Know Nothing" riots in Philadelphia in 1844 resulted in the burning of St. Augustine's Church. The need to rebuild the church and maintain the new college created a financial crisis for the Order. As a result, the College closed its doors on February 20, 1845. It was able to reopen in September, 1846, with a student population of twenty-four, and the first commencement took place on July 21, 1847. The following year, on March 10, 1848, the Governor of Pennsylvania, Francis R. Shunk, signed the Act of Legislature incorporating the College.

In 1857, Villanova College closed for a second time. Demands on the services of priests through the expansion of parishes in the area created staffing problems for the Augustinians, while the Panic of 1857 brought on hard economic times. The onslaught of the Civil War in 1860 affected student enrollment and the College was not reopened until September, 1865. In the years that followed, the College prospered, increasing its student population and adding significantly to its physical facilities.

College of Liberal Arts and Sciences

Although in the first fifty years of its existence, the College concentrated exclusively on the liberal arts, it nevertheless remained open to the changes in the curriculum which were required to meet the needs of the time and the demands for specialization. Responding to the demands of the medical profession for new requirements, for example, the College inaugurated its Sciences unit in 1915, and established as the standard premedical course, a four-year program leading to a Bachelor of Science degree in Biology.

Today, the College continues to offer a variety of educational programs which are aimed at the total growth of the individual, and which prepare students for viable careers. Graduates of the College have taken their place in almost every field of endeavor, serving in education, business, government, law, medicine and research, where they make vital contributions to the communities and the world in which they live.

OBJECTIVES

The College of Liberal Arts and Sciences exists to provide an atmosphere of responsible learning to a varied group of students who will be called to intellectual, moral, and professional leadership. To fulfill these goals, the College seeks to promote intellectual curiosity and rigor within the University, to instill the fundamentals of critical insight, mature judgment, and independent thinking in its students, and to awaken in its students a sense of the importance of values and the moral responsibility of caring for others and working for the betterment of society.

Villanova has always openly and proudly declared that it is a Catholic institution of higher learning. The University maintains a strong respect for the beliefs of its diverse community of faculty, students, and staff. In keeping with its central place in a Catholic University, the College of Liberal Arts and Sciences has a special commitment to the Christian belief that creation is an expression of divine truth through the redemptive life, death and resurrection of Jesus Christ, the incarnate Word of God. It also seeks to provide a Christian intellectual and moral environment and believes that it is the common right of all to participate in creation, to seek truth and to apply such truth attained to protect and enrich personal and communal life.

Villanova's special Augustinian heritage enables the College to draw upon the dynamic legacy of St. Augustine whose passionate pursuit of wisdom, understood through the metaphor of one heart and one mind, inspires its own quest for knowledge in open, intelligent, responsible and mutually respectful interaction of points of view. This legacy is classically illustrated by the Augustinian Order's impact on the medieval universities, its distinguished cultivation of Renaissance art, and its fostering of the scientific discoveries of Gregor Mendel. It is further expressed in the conviction that all authentic human wisdom is ultimately in harmony with Divine Wisdom, and it invites collaboration with other Christians and peoples of other traditions who might share at least the general features and dynamics of this Augustinian vision.

In light of this legacy, the College has developed a diversified academic program and a core curriculum which provide its students with a scale of well-defined universal values that equips them to be wise critics of the society in which they live, and which sustains a moral base and social consciousness that transcends economic barriers and questions of race, gender, and creed.

ACADEMIC MISSION

The academic mission of the College is intimately connected with its Curriculum. The courses in the Core Curriculum treat a broad range of disciplines from a variety of approaches; at the same time, the Core strives to ensure depth of study and intellectual sophistication while recognizing that learning implies different modes of inquiry. The objectives of the Core are to:

- ? Achieve a synthesis of knowledge that provides a basis for informed judgement, not simply “fact finding”.
- ? Promote literacy as a foundation for intelligent discourse and the articulation of informed views.
- ? Advance culture in a broad sense, educating students to understand and to appreciate the interrelated patterns of customary beliefs and practices, social forms, aesthetics, and material traits that act to define a

culture and its position within a larger historical and intellectual framework. The educational program does not simply look to the past, but acknowledges that culture is vibrant and continuously redefined.

- ? Challenge students to understand that the present is recognizably formed from past influences and that in order to assess our culture and arrive at a view of its future, students must be trained to scrutinize and bring into perspective the relationship of the present culture with that of the past.
- ? Prepare students to become active participants within society, to engage in the process of informed political debate, to discover the impact of new technologies, and to encourage an understanding and appreciation of the diversity of cultures and experiences, a respect for the individual, and the development of a multicultural and international perspective.
- ? Encourage personal development in preparing students to regard themselves as citizens living in a democratic society, as belonging to a world community, and as therefore having communal responsibilities.

MISSION TO ITS STUDENTS FACULTY AND STAFF

The College strongly adheres to the principles of the University Mission Statement which commits Villanova to “developing and sustaining an academic environment in which the potentialities of its members may be realized.” In so doing, the College is guided by the teachings of Vatican II which emphasized that “the human spirit must be cultivated in such a way that there results a growth in its ability to wonder, to understand, to contemplate, to make personal judgements, and to develop a religious, moral, and social sense” (*Pastoral Constitution on the Church in the Modern World*, 59).

In order to fulfill its academic mission of transmitting, pursuing and discovering knowledge, the College commits itself to the hiring and retaining of outstanding teacher-scholars and dedicated staff personnel whose academic and professional interests will develop and foster the goals of the University’s Mission Statement. In hiring faculty and staff personnel, the College further commits itself to the goal of maintaining a richness of diversity by actively recruiting women and minorities. In all hiring strategies and decisions, the College strives to utilize procedures that will reliably determine the best qualified applicants.

While the College is committed to maintaining its Catholic identity, it does not seek a particular religious affiliation within its personnel. Rather, as formulated in the University’s Mission Statement, it asks that all respect its “attempts to develop an environment in which students, faculty and staff may experience a Christian intellectual and moral perspective,” and have a willingness to enter into the conversation that gives its mission life and character.

The College is strongly committed to academic freedom which makes open discussion and inquiry possible. It believes that open discussion among scholars and students is a self-correcting process that is intrinsic to academic freedom and that this process is in accord with responsible freedom, a central value of the Christian tradition, and of the thought of St. Augustine, himself the great theologian of Christian freedom.

The College seeks to encourage and equitably reward the valuable performance of its faculty and staff by offering competitive salaries and by making available opportunities which will enhance their professional development. It also seeks to promote a congenial work environment that is conducive to self-motivation. In recruiting students, the College will seek to ensure the best applicant pool possible. It will strive to retain students by offering excellent academic programs and by providing them with quality campus activities.

DEGREES OFFERED

The College of Liberal Arts and Sciences offers the Bachelor of Arts degree in Art History, Classical Studies, Communication Economics, English, French, General Arts, Geography, German, History, Honors Program, Human Services, Philosophy, Political Science, Psychology, Sociology, Spanish, and Theology and Religious Studies.

A Bachelor of Science degree is offered in Astronomy and Astrophysics, Biology, Chemistry, Comprehensive Science, Computer Science, Secondary Education, Honors Program, Mathematics, and Physics. The chemistry program is accredited by the American Chemical Society and the computer science program is accredited by the

Computer Science Accreditation Commission of the Computing Sciences Accreditation Board, a specialized accreditation body.

The requirements for degrees in these majors may be found under the departmental listings contained in this *Catalog*. Students must earn a 2.0 grade point average in their major as well as a 2.0 QPA overall. See the section on Minors, Concentrations, and Certificates for additional information related to degree programs.

BACCALAUREATE DEGREE REQUIREMENTS

The requirements for a Bachelor of Arts or a Bachelor of Science degree are:

- ? A minimum of 40 courses and 2 labs (science degrees vary according to major), which includes the successful completion of the Core Curriculum (general core requirements and distribution requirements), an academic major, and electives.
- ? A minimum of 122 credits (science degrees vary according to major).
- ? A minimum grade point average (QPA) of 2.00.
- ? Residency requirement: the final 30 credits (senior year), at least half of all courses in one's major, and at least half of the courses required for the degree, must be taken at Villanova University. Students may complement their majors by taking one or more interdisciplinary concentrations, as described below in the section on "Minors, Concentrations, and Certificates."

THE CORE CURRICULUM

OBJECTIVES

The courses in the Core Curriculum treat a broad range of disciplines, using a variety of approaches and different modes of inquiry. At the same time, the Core strives to ensure depth of study and intellectual sophistication. The purpose of the Core is to achieve a synthesis of knowledge that provides a basis for informed judgement. The Core also seeks to promote literacy as a foundation for intelligent discourse and the articulation of informed views.

The Core aims to advance culture in a broad sense, training students to understand and to appreciate the interrelated patterns of customary beliefs and practices, social forms, aesthetics, and material traits that act to define a culture and its position within a larger historical and intellectual framework. This educational program does not simply look to the past, but acknowledges that culture is vibrant and continuously redefined. The Core challenges students to understand how the present is recognizably formed from past influences, and that in order to assess our culture and arrive at a view of its future, students must be trained to scrutinize and bring into perspective the relationship of the present culture with that of the past.

In fostering active participation in learning, the Core prepares students to become active participants within society, to engage in the process of informed political debate, and to encourage an understanding and appreciation of the diversity of cultures and experiences, a respect for the individual, and the development of a multi-cultural and international perspective. In this way the Core encourages personal development in preparing students to regard themselves as citizens living in a democratic society, as belonging to a world community, and as therefore having communal responsibilities.

CORE CURRICULUM GENERAL REQUIREMENTS

All candidates for a baccalaureate degree in the College of Liberal Arts and Sciences must complete the following requirements:

Core Humanities Seminar	2 courses	Mathematics	1 course
College Ethics	1 course	Mathematics/Computer Science	1 course

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Fine Arts	1 course	Philosophy	2 courses
Foreign Language	2 courses	T h e o l o g y a n d R e l i g i o u s S t u d i e s	
	2 courses		
History	2 courses	Social Sciences	3 courses
Literature	2 courses	Natural Science (with lab)	2 courses

In general, once a sequence of courses is begun in a particular discipline, a student may not revert to a lower level course in that same discipline to fulfill a core requirement without prior approval from the Dean's Office. Courses or sections of courses that are approved to fulfill Core requirements are designated as such in the Pre-registration Master Schedule issued at pre-registration each semester. Retroactive approval of a course taken previously for fulfillment of a core requirement is not possible.

Core Humanities Seminar (2 courses): During the first year of study, each student must successfully complete CHS 1000 (Ancient, Medieval and Renaissance Thought) and CHS 1001 (Modern Thought: Enlightenment to the Present)

College Ethics (1 course): Each student (normally during the sophomore year) must successfully complete ETH 2050 (Ethical Traditions and Contemporary Life)

Fine Arts (1 course): Each student is required to take one semester of Fine Arts. Art History, Theatre, studio art courses which have a theoretical basis, and courses in music appreciation and film analysis are examples of courses which will fulfill this requirement. Consult the Master Schedule issued each semester at pre-registration for a list of courses that will fulfill this requirement.

Foreign Language (2 courses): In most cases, each student is required to complete at least two courses in the same foreign language at or above the intermediate level. For most students this requirement will involve a two-semester continuation of a language studied in high school. A student may elect to study a new language, which will entail completing two semesters of the language at the introductory level in addition to satisfying the intermediate level course requirement. In these cases, the two introductory level courses will be counted as electives if that language was *not* studied for two or more years at the high school level.

The language requirement may also be satisfied with two semesters of study at the introductory level for Arabic, Chinese, ancient Greek, Japanese, or Russian.

International students (for whom English is a second language) may not choose their native language to fulfill the language requirement. Instead, they may take a total of four English courses (ENG 1050 and three literature courses at the 2100 level or above) to fulfill both the literature and foreign language core requirements.

NOTE: The credit value of language courses varies from three to six credits. Regardless of the number of credits, a language course counts for only one course.

History (2 courses): Each student must successfully complete HIS 1050 and a second History course with a course number of 2000 or higher.

Literature (2 courses): Each student must successfully complete ENG 1050 and a second literature course with a course number of 2100 or higher chosen from the English departmental course offerings.

Mathematical Sciences/Computing Sciences (2 courses): Students may choose *two courses* in mathematical sciences (MAT) or *one course* in mathematical sciences and *one course* from computing sciences (CSC). All courses for which a student has the appropriate pre-requisites or equivalent experience may be used to satisfy this requirement. Beginning a course in a particular series does not obligate a student to finish that series. For example, a student taking MAT 1320 (Calculus I) is not required to take MAT 1325 (Calculus II). *NOTE: Students majoring in a science or those intending to apply to medical, dental or veterinary school must take two*

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semesters of Calculus. Additional information is available from the Dr. Friede, Health Sciences Adviser (519-4833).

Philosophy (2 courses): Each student must successfully complete PHI 1050 and a second philosophy course with a course number of 2000 or higher.

Theology and Religious Studies (2 courses): Each student must successfully complete THL 1050 and a second Theology and Religious Studies course with a course number of 2000 or higher. The required introductory course, Theology and Religious Studies 1050, is an academic presentation of Christian thought, suitable for any student. It is normally taken during the sophomore year. In special cases, the following courses may be substituted for this course with permission from the Dean: THL 2800; THL 5400; THL 5800; THL 5900

Social Sciences (3 courses): Each student must successfully complete one introductory course in each of two distinct disciplines, and one advanced course (2000 level or above) in one of those two disciplines. The Social Sciences disciplines are: Economics, Geography, Political Science, Psychology, and Sociology.

Natural Sciences (2 courses with 2 labs): Each student must successfully complete, by the end of the sophomore year, two semesters of natural sciences with accompanying laboratories. Each student may choose Option A or Option B as described below:

Natural Sciences Option A: A year-long sequence (two courses with two labs) in one scientific discipline consisting of an introductory course followed by a theme course for which an introductory course is a prerequisite. These courses have been designed for non-science majors. The following sequences may be used to satisfy this option:

- ? AST 1050/1051 and AST 1052/1053.
- ? AST 1070/1071 and AST 1072/1073 or AST 1074/1075.
- ? BIO 1505 and BIO 1605, or 1625, or 1655 or 1705. Offerings will vary from year to year.
- ? CHM 1021/1001 and CHM 1022/1002.
- ? CHM 1050/1001 and CHM 1051/1002, or 1052/1001, or 1053/1002 or 1054/1002.
- ? PHY 1010/1011 and PHY 1012/1013.
- ? PHY 1020/1021 and PHY 1022/1023.

Natural Sciences Option B - A year-long sequence (two courses with labs) in one scientific discipline. These courses are generally taken by science majors. The following course sequences satisfy this option:

- ? AST 2121/2133 and AST 2122/2134.
- ? BIO 2105 and BIO 2106.
- ? CHM 1131/1103 and CHM 1134/1108.
- ? CHM 1151/1103 and CHM 1152/1104.
- ? PHY 2410/2411 and PHY 2412/2413.

CORE CURRICULUM DISTRIBUTION REQUIREMENTS

In addition to satisfying the curricular requirements listed above, students are required to satisfy certain distribution requirements. The distribution requirements may be satisfied by courses used to satisfy either core, major or elective requirements. Additionally, a single course may satisfy more than one of the distribution requirements.

Writing Requirement (8 courses): Each student must take at least four courses which are designated as *Writing Intensive* and four courses which are designated as *Writing Enriched*. These designations will appear in the Master Schedule available during pre-registration each semester.

The Core Humanities Seminars (1000 and 1001) and the Introductory Literature course (ENG 1050) fulfill three of the four Writing Intensive course requirements. The fourth Writing Intensive course requirement is to be taken in the student's major area. College Ethics (ETH 2050) fulfills one of the four Writing Enriched requirements.

Integrative Sequences (2 sequences of 2 courses each): Integrative courses enable a student to examine a topic or theme from the perspective of several disciplines. One of these sequences is to be in the humanities and the other is to be in the sciences. The two Core Humanities Seminars fulfill the former and the Natural Science core requirement fulfills the latter.

Diversity Requirement (2 courses): Each student is required to select one course in two of the following three areas:

- ? Diversity (1) - courses which provide a focus on studies emphasizing ethnic and minority experiences in the United States.
- ? Diversity (2) - courses which provide a focus on women's experiences and highlight the ways in which gender influences experience.
- ? Diversity (3) - courses which provide a focus on the culture, economics, politics or ecology of societies and nations other than those of Europe and the United States.

NOTE:

1. A student may not use a single course to fulfill more than one category of the diversity requirement.
2. The diversity requirement cannot be fulfilled by independent study or a senior thesis.
3. Language courses cannot fulfill the requirement, although literature courses in a foreign language can fulfill the requirement provided they focus on appropriate material.

MAJORS, MINORS, CONCENTRATIONS, CERTIFICATES

Each candidate for a degree is required to complete a major with at least a 2.0 QPA. Formal declarations of the major should be filed in the College office, usually during the sophomore year. Detailed descriptions of the requirements for each degree are found in the "Departments and Programs" section of this *Catalog*.

A candidate in any major may elect to take an interdisciplinary concentration in the areas listed below. In each of these areas of concentration, the interdisciplinary approach is employed in the planning of course offerings by individual coordinating committees. The chairperson of the coordinating committee serves as director and is responsible for administration of the program concentration. Students who successfully complete program requirements will have the concentration noted on their transcripts and recommendations for graduate schools and prospective employers. For details on requirements for minors, see the entries in the "Departments and Programs" portion of the Liberal Arts and Sciences section of this *Catalog*.

AFRICANA STUDIES (Dr. Maghan Keita, Director)

Established in 1994 at Villanova University, the Africana Studies Program is available to all students in the College of Liberal Arts and Sciences. In addition to offering undergraduate courses which may lead to a minor or concentration in Africana Studies, the program also sponsors co-curricular activities. The activities and curriculum of the Africana Studies Program bring international scholars to Villanova while promoting a greater understanding

of people, and cultures of African descent. Program details are available from the Africana Studies Program in the St. Augustine Center, room 451 (519-4661).

ARAB AND ISLAMIC STUDIES (Fr. Kail Ellis, Director)

A minor and a certificate in Arab and Islamic studies are offered under the auspices of the Center for Arab and Islamic Studies, which was established in 1983. The Center supports a curriculum of undergraduate courses leading to a Minor or Certificate in Arab and Islamic Studies, sponsors co-curricular activities, brings international scholars to Villanova, and engages in other activities to promote understanding of the Arab and Islamic peoples and the dynamics of the Middle East. Program details are available in the Arab and Islamic Studies Office in the St. Augustine Center, room 104, (519-7325).

CRIMINAL JUSTICE (Director T.B.A)

The Criminal Justice Program aids in the translation of public concern over crime into meaningful social action by providing to law enforcement and correctional programs resources and personnel capable of carrying out such action. It also evaluates critically the effectiveness of traditional contemporary procedures for the prevention, control, and correction of criminal behavior. The program, under the guidance of an advisory committee, offers a concentration in Criminal Justice, a certificate program in Criminal Justice, and a certificate program in Private Security. Program details are available in the Criminal Justice Program Office, Geraghty Hall (519-4786).

IRISH STUDIES (Dr. James Murphy, Director)

The Irish Studies Concentration, available to students in all degree program, explores the history and culture of the Irish people from different perspectives -- literature, history, art, politics, and folklore. Fifteen credits are required to complete the concentration. Students must successfully complete two core courses, ENG 2500 and HIS 3216, and any three of the following: AAH 3007; ENG 2450, 2460, 2500, 2700, 3615; HIS 3215, 3216; HON 5601; PSC 4950, 6875; or SOC 6500.

Interested students may also study in Ireland either in a Semester Abroad program or with the Villanova-in-Ireland Summer program at University College Galway. Program details are available in the Irish Studies Program Office, 467 St. Augustine Center (519-4676).

LATIN AMERICAN STUDIES (Dr. Estrella Ogden, Director)

The Latin American Studies Concentration, established in 1988, is open to all undergraduates in the University. The purpose is to provide students with a comprehensive multi-disciplinary understanding and appreciation of Latin America. Interested students may also study in Latin America in a Semester Abroad program or with the Villanova-in-Chile program at the Universidad de Playa Ancha in Valparaiso, Chile. Program details are available in the Department of Modern Languages and Literature, 339 St. Augustine Center (519-4704), or from the Director of International Studies, 420 St. Augustine Center (519-7393).

PEACE AND JUSTICE (Dr. Robert DeFina, Director)

The Program in Peace and Justice, open to all students in the University, offers an interdisciplinary approach to topics of world peace and social justice. The course of study provides students with an opportunity to study the rich tradition of Catholic social teaching as applied to the complex problems of our time. Courses focus on the components of a moral and just society, reflect on the alternative models for socially responsible resolution of injustice and conflict, and provide opportunities to learn the necessary skills for peacemaking. Most courses available in the concentration can fill core curriculum requirements, and thus the concentration can be completed by students in the College of Liberal Arts and Sciences and the College of Commerce and Finance.

Students will have noted on their transcripts that they have completed the Program in Peace and Justice. Interested students should formally declare this to the Director of the Center for Peace and Justice Education. Program details are available from the Peace and Justice Center, Sullivan Hall (ground floor) (519-4499).

RUSSIAN AREA STUDIES (Dr. Jeffrey Hahn, Director)

The Russian Area Studies Concentration was established in 1996 and is open to all students enrolled in the University. The purpose of the concentration is to provide students with a multi-disciplinary comprehension of a complex part of the world. Students enrolled in the concentration will be required to earn 24 credit hours in language, electives, and the capstone seminar. Undergraduates who successfully complete all of the requirements will receive a certificate upon graduation. Requirements for the Concentration include:

Language: Proficiency in Russian language, is fulfilled by the successful completion of at least two semesters of Russian at the intermediate level, or by demonstrated proficiency at an equivalent level. Students are encouraged to study in Russia for a summer or semester.

Electives: Fifteen (15) credit hours, or five courses, selected from among the following: AAH 2009; HIS 3241, 3242; PSC 4401, 5351, 5950; RUS 1131, 1132, 3412, 3717, 3718, 3810, 3818, 3819; THL 5510; and appropriate special topics courses in Economics.

Seminar: A 3-credit multi-disciplinary seminar, generally taken in the senior year, which offers the opportunity to synthesize knowledge obtained in courses and engages the student in a research project which is shared with fellow students in the program.

WOMEN'S STUDIES (Dr. Barbara Wall, Director)

The interdisciplinary Women's Studies Program offers a minor and a concentration to students in all degree programs. Identifying gender as fundamental to the way that men and women understand themselves, Women's Studies focuses on the position of women in history and culture. Courses consider such topics as the cause and consequences of gender division, the legal and economic effects of the subordination of women, and the significance of gender in the formation of systems of thought and symbols. Program details are available in the Women's Studies Office, St. Augustine Center, room 451 (519-4661).

SPECIAL PROGRAMS

ACADEMIC SEMINARS IN WASHINGTON, D.C.

Villanova University in conjunction with the Washington Center sponsors intense two week academic seminars in the District of Columbia in January, May and August. Seminars do not interfere with the University calendar. Upon successful completion of the program, three elective credits are awarded the students. Program details are available in the Internship Office, 451 St. Augustine Center (519-4661).

ASSOCIATE DEGREES

Villanova University, through the College of Liberal Arts and Sciences, awards the Associate of Arts Degree and the Associate of Science Degree in Natural Science. The Associate Degree Program is designed for students who are not seeking a regular baccalaureate degree, but still wish to follow a specific curriculum. The Associate Program can be completed in half the time it normally takes to complete the baccalaureate program. Students completing the associate degree may continue directly toward the completion of requirements for the bachelor degree without any loss of credit or time.

Associate of Arts Program (60 credits)

FIRST YEAR

First Semester

Introductory English
Introductory History

Second Semester

Advanced Literature
Advanced History

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Mathematical/Computing Sciences
Introductory Philosophy
Introductory Theology and Religious Studies

Mathematical/Computing Sciences
College Ethics
Free Elective

SECOND YEAR

First Semester

Advanced Philosophy
Advanced Fine Arts
Social Science Elective
Intermediate Foreign Lang I
Free Elective

Second Semester

Advanced Theology
Social Science Elective
Free Elective
Intermediate Foreign Lang II
Free Elective

Associate of Science in Natural Science (72 credits)

FIRST YEAR

First Semester

CHM 1151,1103
MAT 1500
Intermed Foreign Lang I
Intro Philosophy
Intro Literature

Second Semester

CHM 1152, 1104
MAT 1505
Intermed Foreign Lang II
Intro Theology
Advanced Literature

SECOND YEAR

First Semester

BIO 2105
PHY 2410, 2411
MAT 2500
Intro History
College Ethics

Second Semester

BIO 2106
PHY 2412, 2413
MAT 2705
Advanced History
Advanced Theology

Associate Degree programs designed for the special requirements of physical therapy, occupational therapy, cytotechnology, medical technology, dental hygiene, and diagnostic imaging/multi competency are also available. Interested students should contact the College of Liberal Arts and Sciences.

Students wishing to continue for a baccalaureate degree need to take the required courses as stated in the current catalogue for the major into which they enroll.

BACHELOR OF SCIENCE COMPREHENSIVE PROGRAM (Dr. Frederick Hartmann, Director)

In addition to B.S. degree programs in each of the sciences (see the appropriate department listings at the end of the College section), the College of Liberal Arts and Sciences offers the Bachelor of Science Comprehensive Program. This curriculum is for the student with a definite interest in science who prefers a broader and more self-directed program than available in the more specialized curricula. The Program is designed for students interested in graduate studies in science and medicine.

The following courses are required of Comprehensive Science majors: BIO 2105, 2106; CHM 1151/1103, 1152/1104; PHY 2410/2411, 2412/13 or 2414/15; MAT 1500, 1505, 2500, 2705 or 4310 or CSC 1051. In addition, Comprehensive Science majors are required to take eight additional science electives to be chosen in consultation with the Comprehensive Science adviser.

Program details are available in the Comprehensive Science Program Office, 451 St. Augustine Center (519-4661).

BUSINESS MINOR PROGRAM

Students in Liberal Arts and Sciences may take courses leading to a business minor, consisting of ten designated courses, all of which must be taken at Villanova. Candidacy for the program leading to the business minor is offered on a competitive basis to first-year students. A student's quality point average will be the basis for acceptance into the program. Applications for the program may be obtained in the Dean's Office, 105 Saint Augustine Center, and must be submitted to that office prior to the end of the fall semester.

Students accepted into the business minor will take the following courses: MAT 1230, 1235; ECO 1001, 1002; ACC 1101, 1102; BL 1090; FIN 1113; MGT 1102; MKT 1137. *NOTE:* Students who complete a MAT 1300 or 1500 sequence as part of their curriculum should substitute MAT 2310 or MAT 4310 for MAT 1230 and MAT 1235.

ELEMENTARY EDUCATION CERTIFICATION – ROSEMONT COLLEGE

Villanova, in cooperation with neighboring Rosemont College, offers students a program leading to a Pennsylvania-approved program in elementary education certification. Students planning to teach are admitted to the teacher certification program in the sophomore year after interviews and scholastic averages indicate they have the acceptable qualifications. A Villanova student may be recommended for certification in elementary education by Rosemont College by satisfactorily completing (1) all major and core requirements of Villanova University, (2) the professional education requirements of Rosemont College, and (3) the necessary psychology and education courses at Villanova.

Interested students must make application to the Office of the Dean through the Director of General Arts, St. Augustine Center, room 451, in the fall semester of their sophomore year and must have achieved a cumulative grade point average of 2.75. An interview with the Director of the Education Program at Rosemont College is required. A limited number of students may be accommodated in this program. Students should arrange their own transportation.

Students in the Elementary Education Program are required to complete professional courses, and student teaching during the first semester of the senior year. To be eligible for the student teaching experience, students must fulfill the following requirements:

1. A cumulative grade point average of 2.75 with a minimum grade of C in each required professional course.
2. A cumulative grade point average of 2.75 in the student's major and a recommendation from the Villanova department chairperson.
3. Doctor's certification of physical and mental health.

SECONDARY EDUCATION PROGRAM AND TEACHER CERTIFICATION

Villanova University's secondary teacher education program has been approved by the Pennsylvania Department of Education as satisfying the requirements for teacher certification in twelve subject areas. Students who are enrolled in the Bachelor of Science in Education program are also enrolled in the teacher education program. Upon completion of the degree and the National Teachers Examination (NTE) in communication skills, general knowledge, professional knowledge and subject specialization, the student will be eligible for certification. Pennsylvania teacher certification is reciprocal with most other states.

Students in other departments may be admitted to the teacher education program upon the approval of the Undergraduate Committee. Students admitted to the teacher education program must complete the same requirements as the candidate for the Bachelor of Science in Education, including student teaching.

With the exception of Education 4220, 4281, 4282, 4283, 4284, 4285, 4286, 4291 and 4292, Education courses may be taken as electives by students in other departments of the University.

Students enrolled in the Teacher Education Program will have their work reviewed each semester by a department committee to determine progress and professional development for certification. Students must achieve a 2.5 cumulative average in their teaching specialty before student teaching and meet the academic standards of the University.

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All Education majors will select a Content Area in which to be certified. The specific courses in the Content Area are determined by the Department and the subject area department. Student Teaching is normally taken in the second semester of the senior year.

The core curriculum for Education majors differs in some respects from the normal Arts and Sciences core and interested students should contact the Department of Education and Human Services. Students who possess a bachelor's degree and want to pursue Teacher Certification on a part-time or full-time basis should apply through the Office of Part-Time Studies.

EXCHANGE PROGRAMS

Villanova University enjoys cooperative exchange arrangements with neighboring Rosemont College and nearby Gratz College, allowing Villanova students the opportunity to take classes at the other schools. Students who participate in the exchange program must possess a cumulative average of 2.75. Superior juniors and seniors in the College of Liberal Arts and Sciences may take courses at Bryn Mawr College on a limited basis. Courses taken at Bryn Mawr must be in the student's field of study and not offered at Villanova. Registration is through the Honors Program Office, room 103, St. Augustine Center (519-4650).

HONORS PROGRAM (Dr. Edwin Goff, Director)

The Honors Program is designed to bring together superior students and dedicated faculty in a small college environment of rigorous seminars, flexible requirements, and independent research in order to promote breadth, diversity, and depth throughout the students' academic careers. The Program is open to students in all undergraduate colleges with the approval of the Honors Director. The Program offers the Bachelor of Arts and Bachelor of Science degrees. To qualify for an Honors Program degree, the student must be a full-time participant in the Honors Program, must complete a specified sequence of courses, and must maintain a 3.25 QPA with periodic evaluation and approval by the Honors teaching staff. For students whose course of studies prevents them from pursuing an Honors Program degree, an Honors sequence in Liberal Studies is available, which requires a minimum of eight Honors courses, a 3.25 QPA, and periodic evaluation and approval by the Honors teaching staff. Program details can be found in the "Honors Program" section of this *Catalog* and are available in the Honors Program Office, 103 St. Augustine Center (519-4650).

HUMAN SERVICES PROGRAM

The Bachelor of Arts in Human Services is designed for the student who chooses a liberal arts degree combined with an opportunity to pursue an experiential component geared toward the human services area. The program is for those who want to combine a liberal arts education with expertise in basic communication skills, human resource development, and knowledge of the professional field and are interested in the fields of business. The practicum experience gives the student the opportunity to work in an agency setting pertinent to the chosen specialization. Upon completion of the degree requirements, students will have minors in Psychology and Sociology. The program also prepares the student to pursue graduate level courses in Counseling and Human Relations.

INTERNATIONAL STUDIES

The College of Liberal Arts and Sciences strongly encourages all majors in the College to consider studying overseas in a foreign university for a summer, a semester, or for a year during the sophomore or junior years at Villanova. Villanova has its own six-week overseas summer programs in Chile, France, Ireland, Italy, Palestine, and Spain open to all Villanova students for intensive language or area studies. Students may study subjects in their major, minor or concentrations, strengthen their modern language skills, or complete Core course requirements through Overseas Programs. In any case, students normally enhance past skills such as high school languages learned but no longer studied due to heavy course requirements at Villanova, work towards a career path through overseas internships, gain fluency in language currently being studied, or begin learning a language. Interested students should see the detailed discussion of International Studies in the Villanova University section of this catalog or contact the Office of International Studies, St. Augustine Center, Room 415, (phone 610-519-6412).

INTERNSHIPS

The College of Liberal Arts and Sciences provides its students with the opportunity to earn course credit in departmentally related and academically creditable internships. The following departments offer this option: Art History, Biology, Chemistry, Communication, Computer Science, Economics, English, Geography, History, Mathematics, Philosophy, Political Science, Psychology, and Sociology (Criminal Justice). Internships are not restricted to the Delaware Valley, and might take place in Washington, DC, as well as other parts of the country. Qualified juniors and seniors with a 3.0 QPA are eligible to participate in the program. Internships last for the semester and can be either full-time or part-time. They are also available during the summer sessions. Program details are available from the Internship Director, room 451 of the St. Augustine Center (519-4661).

NAVAL SCIENCE

Eligibility for a commission in the U.S. Navy, Naval Reserve, U.S. Marine Corps or Marine Corps Reserve, through the NROTC Program, is contingent upon successful completion of required University and naval professional courses of study. Program details are found in the Naval Science course listings section of this *Catalog*.

ACADEMIC POLICIES AND INFORMATION

Unless otherwise noted, the College of Liberal Arts and Sciences follows the general academic policies and regulations listed in the University section of this *Catalog*. *It is the responsibility of the student to know and comply with all academic policies and regulations of the University and of the College of Liberal Arts and Sciences. Such policies may change without prior notice.* Policies specific to the College of Liberal Arts and Sciences follow:

ACADEMIC STANDING AND ACADEMIC PROBATION

The College Academic Standing Committees meet at the end of each regular semester to review the academic records of any student in the College who is on Academic probation or experiencing academic difficulties. The Committee recommends corrective actions to the Dean that may range from Letters of Concern to Probation to a Drop From the College. Each student deserving corrective action will receive a letter from the Dean's office stating the action taken. While on academic probation, a student's course load may be limited to four courses plus any associated laboratories, *and* the student may not participate in any extracurricular activities. Students may be removed from the Academic Probation List only upon satisfying each of the requirements of the term of probation.

There is no requirement that a student must receive a Letter of Concern or Probation prior to being dropped from the College of Liberal Arts and Sciences, and possibly from the University. A Drop from the College may be appealed in writing. Detailed instructions accompany each letter from the Dean.

ADVISING

Every student in the College of Liberal Arts and Sciences is assigned an academic adviser. Before declaring a major, each student is assigned to a specially trained faculty member who serves as the student's pre-major adviser. After declaration of major, advising is done by faculty in the student's major department.

CLOSED SECTIONS

Ordinarily, students will not be permitted to enroll in closed sections. Exceptions to this rule can be made only by the appropriate chairperson and only when a student graduating at the end of the current semester must enroll in the specific section in order to complete his or her primary major. If other sections or other courses are available to satisfy the degree requirements, the exception will not be granted.

DEAN'S LIST

College of Liberal Arts and Sciences

At the end of each academic year, the College of Liberal Arts and Sciences officially recognizes its best students by including their names on the Dean's List. Inclusion on the list is a tribute to a student's diligent work and superior academic performance. In an effort to retain the honor which is integral to membership on the list, the requirements for inclusion are justifiably rigorous.

In order to be named to the Dean's list, a student in the College of Liberal Arts and Sciences must maintain a minimum semester grade point average of 3.50 in both the fall and the spring semesters of a single academic year. All students included on the list will receive a congratulatory letter from the Dean following the conclusion of the spring semester.

GRADUATE COURSES

A qualified Senior with a cumulative QPA of 3.0 may enroll in a graduate course upon obtaining the written approval of the adviser, the department chairperson of the course involved, and the Dean before submitting the request to the Dean of the Graduate School.

Courses numbered 7000-7999 are graduate courses open to qualified undergraduates. Courses numbered 8000-9999 are graduate courses not ordinarily open to undergraduates.

MEDALLION OF EXCELLENCE

Each department in the College of Liberal Arts and Sciences may nominate one graduating senior each year to receive a Medallion of Excellence. Generally, to be eligible for nomination, students must have earned a minimum of three-fourths of their degree at Villanova in the College of Liberal Arts and Sciences and must have a minimum cumulative grade point average of 3.50.

Each department has named its medallion either for a luminary from the past who has deeply affected the discipline or an outstanding person who helped to shape the course of study at Villanova University.

PHI BETA KAPPA

Phi Beta Kappa is a National Honors Fraternity for Colleges of Liberal Arts and Sciences. It was founded at the College of William and Mary in 1776. Since that time, its rigorous and comprehensive standards have made election to it a premier sign of excellence. Villanova University became one of the colleges and universities to shelter a chapter when the Sigma of Pennsylvania Chapter of Phi Beta Kappa was installed at Villanova in April 1986. The Phi Beta Kappa standards reflect the highest ideals of liberal education at Villanova: education that is concerned with values as well as facts, and wisdom as well as knowledge; education that seeks freedom from ignorance, alienation, and inhumanity; that values intellectual integrity and tolerance over expediency, and breadth of scholarly achievement over specialized expertise.

Juniors and seniors who are candidates for a degree in the College of Liberal Arts and Sciences, whose academic achievements reflect the goals of Phi Beta Kappa, and who meet the following specific criteria shall be eligible for consideration for election to Phi Beta Kappa:

- ? Candidates must have completed three semesters of work in the College of Liberal Arts and Sciences and be fully registered for a fourth.
- ? Candidates must have a grade point average of at least 3.50 (3.80 to be elected as a junior).
- ? At least three-fourths of a candidate's academic work must have been taken in the liberal arts and sciences, as distinct from applied or professional work.

In choosing candidates for election, the Chapter seeks evidence of academic achievement that is of exceptional distinction, and gives weight to the breadth and the quality of the overall program of courses taken by each candidate.

Election to membership in Phi Beta Kappa is wholly within the discretion of the members of the Chapter, subject only to the limitations imposed by its Constitution and By-Laws. Fulfillment of the minimum qualifications does not assure election to the membership.

PRE-PROFESSIONAL HEALTH RELATED SCIENCE Adviser (Dr. John Friede)

The Health Related Science Adviser:

- ? Provides information to prospective students and their parents regarding Villanova University's programs in the sciences and how Villanova University can prepare them for careers in health related professions;
- ? Provides information to matriculated students on professional schools and their application processes;
- ? Prepares the evaluation materials for each Villanova student applying to a professional school in the health sciences; and
- ? Serves as the academic adviser for students accepted into the affiliation programs.

Additional information is available from the Health Science Adviser in 118 Mendel Hall (519-4833) or from Office of the College of Liberal Arts and Sciences.

SATISFACTORY/UNSATISFACTORY OPTION

Sophomores, Juniors, and Seniors may take one elective course a semester on a satisfactory/unsatisfactory basis. The satisfactory/unsatisfactory option may not be used for courses that fulfill core, major or minor requirements, but individual departments may offer the major seminar on a satisfactory/unsatisfactory basis.

SCHOLASTIC LOAD

A student must take a minimum of 12 credits a semester to be a full-time student. A normal scholastic load (usually five courses plus labs) is defined by the program of studies set forth in this *Catalog*. Permission to take one other course in excess of the normal load may be obtained with the written approval of the Dean.

In order to qualify for such approval in the College of Liberal Arts and Sciences, a student must demonstrate academic proficiency of a high order as indicated by a 3.5 cumulative average.

SUMMER SCHOOL AT VILLANOVA

In order to accommodate students wishing to accelerate or enrich their studies, Villanova offers three summer sessions. Courses taken in Villanova Summer School are treated as though they were taken during the year. Prior to enrollment in Villanova Summer School, students in the College of Liberal Arts and Sciences must secure an adviser's signature.

SUMMER SCHOOL AT OTHER INSTITUTIONS

Students in the College of Liberal Arts and Sciences may be permitted to take summer school courses at institutions other than Villanova University. In all cases permission to enroll in such courses must be obtained from the student's adviser and from the Dean's Office before enrolling in the course(s).

Courses will generally be approved if they are taken at accredited four year colleges or universities and if they are equivalent to course offerings at Villanova. Upon completion of the course it is the student's responsibility to see that an official, sealed transcript is sent to the College of Liberal Arts and Sciences at Villanova.

Transfer credit will be awarded on the Villanova transcript only for pre-approved courses in which a student earns a grade of "C" or better. The actual grade received at the other institution does not transfer and is not calculated into the student's cumulative grade point average.

WITHDRAWAL FROM A COURSE

After the Friday following mid-term break, and up to and including the last day of the semester, students may withdraw from a course without academic penalty and receive the grade of "WX" *only* by permission of the Dean of the College. Students may request an authorized withdrawal by providing to the Dean a written statement of justifiable cause for withdrawal as well as the written recommendation of the instructor and the student's chairperson. Justifiable cause is a reason such as illness which is extrinsic to the nature or difficulty of a course and which would prevent a student from completing the substantial requirements of the course. The proper form for this procedure may be obtained in the Dean's Office, 105 St. Augustine Center.

SAMPLE DEGREE PROGRAMS

The following chart offers a sample program for students with majors in the Liberal Arts. It is just one of the many possible arrangements students may choose in pursuing a degree. Students are required to meet with an assigned adviser at least once each semester in order to select courses for registration. While a student may decide to alter the following course order, no courses may be omitted. It is exclusively the responsibility of the student to see that the appropriate courses are selected in the pursuit of any of the various degrees in the College.

SAMPLE CURRICULUM FOR AN ARTS MAJOR PROGRAM

FIRST YEAR

Fall Semester

Core Humanities Seminar*
 Introductory Philosophy
 Social Science
 Language
 Mathematical/Computing Sciences

Spring Semester

Core Humanities Seminar*
 Introductory Literature
 Introductory History
 Language
 Mathematical/Computing Sciences

SECOND YEAR

Fall Semester

Natural Science & Laboratory*
 Fine Arts
 Introductory Theology
 Elective/Major/Social Science
 Adv. Humanities (History/Philos)

Spring Semester

Natural Science & Laboratory*
 College Ethics
 Social Science
 Elective/Major/Social Science
 Adv. Humanities (Theol/Literature)

THIRD YEAR

Fall Semester

Major
 Major
 Advanced Humanities
 Elective
 Elective

Spring Semester

Major
 Major
 Advanced Humanities
 Elective
 Elective

FOURTH YEAR

Fall Semester

Major
 Major
 Elective
 Elective
 Elective

Spring Semester

Major
 Major
 Elective
 Elective
 Elective

*NOTE: These courses must be taken in the semester indicated.

SAMPLE CURRICULUM FOR A SCIENCES MAJOR PROGRAM

The following chart offers a sample program for students with majors in the Sciences. Students are required to meet with an assigned adviser at least once each semester in order to select courses for registration. While a student may decide to alter the following course order, no courses may be omitted. It is exclusively the

Villanova University

responsibility of the student to see that the appropriate courses are selected in the pursuit of any of the various degrees in the College.

FIRST YEAR

Fall Semester

Core Humanities Seminar
Major Science
Science or Core
Mathematics
Foreign Language

Spring Semester

Core Humanities Seminar
Major Science
Science or Core Requirement
Mathematics
Foreign Language

SECOND YEAR

Fall Semester

Major Science
Major Science
Math or Core
Science or Core
Introductory Literature

Spring Semester

Major Science
Major Science
Math or Core
Science or Core
Core Elective

THIRD YEAR

Fall Semester

Major Science
Major Science
Science or Core
Advanced Humanities
Elective

Spring Semester

Major Science
Major Science
Science or Core Requirement
Advanced Humanities
Elective

FOURTH YEAR

Fall Semester

Major Science
Major Science
Science or Core
Advanced Humanities
Elective

Spring Semester

Major Science
Major Science
Science or Core Requirement
Advanced Humanities
Elective

Students wishing to receive the Bachelor of Science in Astronomy and Astrophysics, Biology, Chemistry, Computer Science, Mathematics, Physics or the Bachelor of Science Comprehensive Program must attain a QPA of 2.00 in the science and mathematics courses taken in fulfillment of their major, as well as attaining an overall QPA of 2.00.

DEPARTMENTS AND PROGRAMS

NOTE: In the courses listed below, the semester listings indicate which semester the courses is offered. If there is no semester listing, the course is offered on an occasional basis only.

AEROSPACE STUDIES

Faculty: Bowman, King, Howell, Romano

Air Force Reserve Officer Training Corps participation is available through a cross-enrollment agreement with St. Joseph's University. Participation in a 2, 3, or 4 year program leads to a commission as a Second Lieutenant in the Air Force. Scholarships are available for technical majors. Contact AFROTC Detachment 750 at (215) 871-8324 for further details.

AER 1011 Air Force Today I The military as a profession, including: civilian control of U.S. Armed Forces, functions and organization of the U.S. Air Force, organization and operations of U.S. strategic offensive forces. **(1 cr)**

AER 1021 Air Force Today II The U.S. general purpose and defensive forces including: Mission and organization of the major U.S. Air Force Commands and separate operating agencies, major functions and conduct of joint service military operations. Air defense, detection systems, close air support, and air superiority. **(1 cr)**

AER 1031 Development of Air Power I Aerospace power from balloons and dirigibles through the employment of U.S. air power in World War II. The military theory of aerospace power employment. **(1 cr)**

AER 1041 Development of Air Power II Employment of U.S. air power in the Korean Conflict, relief missions and civic action programs in the later 1960s, and the war in Southeast Asia. The military theory of aerospace force employment. **(1 cr)**

AER 2011 Management and Leadership I Managerial theory, concepts and techniques of decision-making, and the basic functions of management with particular emphasis on applications for Air Force officers. **(3 cr)**

AER 2021 Management and Leadership II An interdisciplinary approach to leadership which includes study of human behavior and relationships, and motivation. **(3 cr)**

AER 2031 National Security Forces I The Armed forces as an integral and inseparable element of society. Emphasis on the overall national security process and the factors which comprise it. The impact of a nation's military, economic, psychological, and technical components on national security policy. Major geopolitical hotspots and the origin of arms races. **(3 cr)**

AER 2041 National Security Forces II Civilian control of the military, conflict control, military professionalism, and military justice. Emphasis on the reciprocal responsibilities of civilians and the military in a democratic society. **(3 cr)**

AFRICANA STUDIES PROGRAM

Director and Associate Professor: Keita
Office: 448 St. Augustine Center, tel. 519-4661

CONCENTRATION: The Africana Studies program combines an introductory core with a number of electives. Concentrators are required to take two courses (six credits) from the introductory core. Each of these courses must be from a different discipline. In addition the student is required to take fifteen credit hours of approved electives. The list of approved electives available in any given semester is available from the Africana Studies Office, St. Augustine 451.

MINOR: For the Africana Studies minor, a student is required to take two courses (six credit hours) from the introductory core. Each of these courses must be from a different discipline. In addition the student is required to take nine credit hours of approved electives.

AFR 5000 Independent Study Independent work on a topic agreed upon by the student and a faculty member. **(3 cr)** *Prereq: permission of the director.*

Introductory Core:

CA 2700 Black Rhetoric

ENG 2505 African American Literature: Poetry

ENG 2510 African American Literature: Novel

ENG 2515 African American Literature: Drama

HIS 2291 African American History during Slavery

HIS 2292 African American History since Slavery

HIS 4115 The Roots of African Culture

HIS 4120 The Emergence of Modern Africa

Sample Electives:

ECO 1103 The Economics of Social Issues

GEO 3700 Africa

HIS 4130 Southern Africa in Historical Perspective

HIS 4470 Third World Revolution

HIS 4490 Topics: Racism and Justice in the Americas

HON 4050 Africana Intellectualism

HON 5700 Urban Realities/Suburban Perspectives

HON 5702 Philosophy, Issues of Race

PJ 5000 Race/Class/Gender

PSC 3500 Civil Rights and Civil Liberties

PSC 4700 Africa

PSC 5500 Africa in World Politics

THL 5700 Black Religious Experience

SOC 3600 Race Relations and Ethnic Relations

The number of electives, and therefore students' choices, will vary from year to year.

ARAB AND ISLAMIC STUDIES

Director and Associate Professor: Ellis
Office: 104 St. Augustine Center, tel. 519-7325

CONCENTRATION: AIS 4100; ARB 1111, 1112, 1121, 1122; HIS 4031, 4041; PSC 4900 or 5900; THL 5150; and one elective from the courses listed below.

MINOR: ARB 1111, 1112; HIS 4041; PSC 4900 or 5900; and two electives. *NOTE:* Students are advised to enter the program no later than the first semester of their junior year in order to complete the requirements. Approval of the program director must be obtained to enter the program. The Center for Arab and Islamic Studies is located in 104 St. Augustine Center (519-7712 or 7325).

Villanova University

AIS 4100 Seminar: Topics in Arab and Islamic Studies Major political, cultural, social and economic issues of contemporary Arab. and Islamic studies. The focus changes, according to the professor. Required for the Certificate and open to other students. **(3 cr)** *Sem 2.*

ARB 1111, 1112 Intensive Basic Modern Standard Arabic I and II

ARB 1121, 1122 Intensive Intermediate Modern Standard Arabic I and II

ARB 1131, 1132 Intensive Advanced Standard Arabic I and II

ARB 1141 Introduction to Colloquial Egyptian Arabic

ARB 2142 Arab Culture and Civilization
HIS 4031 Islamic History and Civilization

HIS 4041 History of the Modern Middle East

PSC 4900 Comparative Politics of the Arab States

PSC 5900 Middle Eastern International Relations

THL 5150 Introduction to Islam

The following cross-listed courses are available as electives:

ECO 3127 Development Economics

GEO 3800 Geography of the Islamic World

PHI 3160 History of Islamic Philosophy

PSC 5700 The Struggle for Power and Oil in the Inner Crescent

PSC 6900 Political Science Seminar

With permission, the following graduate courses are open to qualified undergraduate students:

HIS 8601 Middle East in the World Economy, 18th and 19th Centuries

PSC 8825 Middle East Politics

PSC 9300 American Foreign Policy in the Middle East

ARMY ROTC

Faculty: Lieutenant Colonel Latsha, Captain Karbel, Captain Keim,
Master Sergeant Pearson, Sergeant First Class Carter

ARMY ROTC PROGRAM: By agreement with Widener University's Department of Military Science, Villanova offers a program of study leading to a commission as a Second Lieutenant in the United States Army or Army Reserve. Details are found in the general University section of this *Catalog*.

MS 101 Basic Military Skills I The organization of the Army; military customs, traditions and courtesies; the Army's role in national security; and ethics. Labs focus on marksmanship, mountaineering, individual survival skills. **(1 cr)**

MS 102 Basic Military Skills II Land navigation and small unit operations and tactical principles. Labs focus on developing team work in tactical

environments. **(1 cr)**

MS 201 Introduction to Military Leadership I Military planning and staff procedures. Case study of the dynamics of the military decision making process. Labs focus on first aid. **(1 cr)**

MS 202 Introduction to Military Leadership II Information briefings and tactical orders as vehicles

for the development of self-confidence and presentation skills. Ethical questions and leadership development. Labs focus on tactical planning. **(1 cr)**

MS 301 Advanced Military Leadership I The U.S. Army's philosophy and approach to unit and individual training. Principles of instruction, instructor preparation, use of instructional aids, and instruction evaluation through student presentations. In depth analysis of planning tactical operations. Labs focus on conducting closs order drill and military skills. **(1 cr)** *Prereq: Army ROTC advanced course standing or approval of the professor of military science.*

MS 302 Advanced Military Leadership II Leadership and management principles and their application in the military environment. Developing and assessing leadership in stressful situations. Emphasis on demonstrating expertise in small unit operations, marksmanship, map reading, and physical fitness. Labs focus on training squad tactics. **(3 cr)** *Prereq: Army ROTC advanced course standing or approval of the professor of military science.*

MS 401, 402 Military Organization and Management I and II Senior level study of leadership and management techniques emphasizing application in military operations; staff organization and procedures; resource allocation and the theory/application of military law. The role of the military structure in the execution of national security policy. Case study investigations of the duties, obligations, and responsibilities of a commissioned officer. *Prereq: Army ROTC advanced course standing or approval of the professor of military science. Labs focus on planning, conducting and evaluating training.*

LEADERSHIP LABORATORY All of the above Military Science courses include leadership laboratory. During leadership laboratory, Junior and Senior level cadets conduct training for the Freshmen and Sophomore cadets. The Labs are hands-on leadership training sessions.

ART HISTORY

Chair and Associate Professor: Lindenmeyr
Office: 403 St. Augustine Center, tel. 519-4660

The Art History major and minor are administered by the Chair of the History Department.

MAJOR: AAH 1101 and 1102 plus 27 credit hours in upper-level (2000-4999) art history courses, including one course in each of the general areas of art history, Ancient, Medieval, Renaissance, and Modern, as well as a seminar in art history, an advanced course in either Ancient, Renaissance, or Modern Art and a Senior Thesis. Of these 27 credit hours a student must take at least one studio art course, and one music appreciation course. In the Junior or Senior year, an upper-level history course and courses in classical studies are strongly recommended among the electives. Any art history course offered by the Honors Program will be considered as fulfilling requirements toward the B.A. in Art History.

MINOR: Twelve 12 credits in art history, 3 in studio art, and 3 in music appreciation.

AAH 1100 Introduction to Art The elements of art: form, color, line, design, materials, and techniques. For students who would like to improve their ability to understand painting, sculpture, and architecture. **(3 cr)** *Sem 1*

AAH 1101 Beginnings to Renaissance Architecture, sculpture, and painting from prehistoric times to the high Gothic period. **(3 cr)** *Sem 1*

AAH 1102 Renaissance to Contemporary World (3 cr)
The visual arts from the Early Renaissance to contemporary abstract expressionism. (3 cr) *Sem 2*

AAH 2000 Ancient Art The artistic contributions of the ancient societies of Egypt, the Aegean, Greece and Rome, placed within appropriate cultural contexts. (3 cr)

AAH 2001 Early Christian and Medieval Art The development of western art from the death of Jesus to 1300 A.D. with emphasis on the church as the main patron of painting, sculpture, and architecture during the middle ages. (3 cr) *Sem 2*

AAH 2002 Renaissance Art An examination of classical (Greco-Roman) traditions that reappear in western art between 1300 and 1600 A.D., and its harmony with Christian ideas. From Giotto to the end of Mannerism. (3 cr)

AAH 2003 Age of Rembrandt & Bernini Major works of European painting, sculpture, and architecture from the seventeenth through mid-eighteenth centuries. Special emphasis on how historical events affected the production of artistic monuments. (3 cr) *Sem 2*

AAH 2004 Modern Art An examination of 20th Century visual arts that emphasize their historical roots and present social significance. (3 cr) *Sem 1*

AAH 2005 Religion and Art Factors underlying religious art developed from painting, sculpture and architecture as well as influence of art in the History of Religion. (3 cr)

AAH 2006 American Art The history of painting, sculpture, and architecture in America from the colonial period to modern times. (3 cr) *Sem 1*

AAH 2007 History of Western Architecture Development of architectural styles from the early medieval period to contemporary trends, with emphasis on the modern period. (3 cr)

AAH 2008 The Spirit of the Renaissance The relationship of painting, sculpture, architecture, and graphic arts from the rise of the Sienese and Florentine School to the end of the Venetian school.

(3 cr)
AAH 2009 Sounds of the Slavic Spirit
An exploration of the music of the cultural heritage of the Russian people from chants of Muscovy to the present. (3 cr)

AAH 2010 Introduction to Calligraphy: The Study of Writing A practical and historical approach to the study of writing. The development of the written letter and the ability to use the newly acquired hand, with the proper materials and techniques. (3 cr) *Sem 1&2.*

AAH 3001 Women in Art Themes and images of women in the visual arts as an expression of the needs, desires and attitudes of society; and a study of artists from the past to the present, with regard to how being female may, or may not, have affected their work. (3 cr) *Sem 1.*

AAH 3002 Art of Philadelphia Philadelphia's unique contribution to American painting, sculpture, and architecture, from the early Swedish and Welsh settlers of the Delaware Valley, to Andrew Wyeth and Robert Venturi. Includes field trips and guest lecturers. (3 cr) *Sem 1&2.*

AAH 3003 Romanticism to Post- Impressionism Nineteenth century painting and sculpture in Europe and America, showcasing Cezanne, Courbet, Delacroix, Goya, Eakins, Homer, Manet, Monet, Rodin and West. (3 cr)

AAH 3004 19th and 20th Century Architecture The architecture of the 19th and 20th centuries as an evolutionary development with emphasis on major movements and building developments. (3 cr)

AAH 3005 Chinese Art The growth of visual art in China from Neolithiotimes to 1912, highlighting art as a reflection of change in Chinese society and philosophy. (3 cr)

AAH 3007 Art of Ireland The visual arts in Ireland concentrating on the Golden Age from the 5th to the 9th Century: architecture of the early monastic settlements, manuscript illumination and its influence, and the cultural impact of the Irish forms of monasticism. (3 cr) *Sem 2.*

AAH 3008 An Intro to Art and Architecture of Indian Subcontinent The development of art and architecture on the Indian subcontinent. (3 cr)

AAH 4000 Senior Thesis Independent research projects under the guidance of a departmental faculty member. Passing grade depends on student thesis acceptable to two faculty members. (3 cr) *Sem 1. Prereq: Art History Majors Only.*

AAH 4001 American Architecture Seminar on Architecture and City Planning in the United States from colonial times to the present. (3 cr) *Prereq: One Art History course.*

AAH 4002 Japonisme: Oriental Prints and the Impressionists Seminar on the affect of Japanese wood block color prints on Early Modern Masters. (3 cr) *Sem 2. Prereq: Modern Art.*

AAH 4003 Special Topics of Ancient Through Medieval Seminar on selected topics in Ancient

Art. Projects dealing with political, religious and socioeconomic matters, discussed in the light of Greek and Roman literature. (3 cr) *Prereq: AAH 1101 or permission of instructor.*

AAH 4004 Special Topics of Renaissance Through Baroque Seminar on architecture, painting, sculpture and art theories of the Italian Renaissance. The Quattrocento in light of Neoplatonism and the revival of Classical Antiquity. (3 cr) *Prereq: AAH 1102 or 1104 or permission of instructor.*

AAH 4005 Picasso and Friends Seminar on the 20th century's most famous artist, with discussion of friends such as Braque, Apollinaire, Gertrude Stein, and Erik Satie. (3 cr) *Prereq: Modern Art.*

AAH 4007 Special Topics of Neoclassicism Through Modern Seminar on advanced topics in Modern Painting, Sculpture, and Architecture in European and American Art, 1750 to the present. (3 cr) *Prereq: AAH 2004 or permission of instructor.*

ASTRONOMY AND ASTROPHYSICS

Chair and Professor: McCook

Professors: Guinan, Sion

Associate Professor: Maloney

Assistant Professor: Ambruster

Office: 457 Mendel, tel. 519-4820

MAJOR: AST 1151, 2120, 2121, 2122, 2133, 2134, 3141, 3142, 3152, 4121, 4122; MET 2001; CSC 4630; MAT 1500, 1505, 2500, 2705; PHY 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2601, 2603, 4200, 4202, and 3 Physics courses (9-12 credits) numbered above 3000. Recommended are PHY 4000, 4001, 4002, 4003.

MINOR: 22 credits, including AST 1151, 2120, 2121, 2122, 2133, 2134, and two (2) of the following: AST 3141, 3142, 3152, 4121, 4122; MET 2001. *NOTE: prerequisites in Math and Physics must be met to gain admission to these courses.*

ASTRONOMY

AST 1050 Planet Earth I Earth as a planetary member of the Solar System. Characteristics, history of formation, dynamics, and evolution of the solar system. Emphasis on the fundamental scientific principles at work throughout the universe. (3 cr)

Sem 1. Coreq: AST 1051.

AST 1051 Planet Earth Lab I Laboratory to accompany Planet Earth I. Astronomical observations and principles of experimentation, both with real physical experiments and computer

simulations. **(1 cr)** *Sem 1. Coreq: AST 1050.*

AST 1052 Planet Earth II A continuation of AST 1050 (Planet Earth I). **(3 cr)** *Sem 2. Prereq: AST 1050, 1051. Coreq: AST 1053.*

AST 1053 Planet Earth Lab II A continuation of AST 1051 (Planet Earth Lab I). **(1 cr)** *Sem 2. Prereq: AST 1050, 1051. Coreq: AST 1052.*

AST 1072 The Birth and Death of Stars A study of the life cycles of the stars from their birth in dark, dense interstellar dust clouds to their deaths in nature's most violent cataclysms with a focus on stars and humanity, the formation of the chemical elements, the effects of nearby supernovae, the future of the Sun and the ultimate fate of Earth, and the question of planetary systems around other stars. **(3 cr)** *Sem 1. Coreq: AST 1073 for arts students completing their core science requirement.*

AST 1073 Stellar Lab Laboratory focuses on stellar and galactic problems. **(1 cr)** *Sem 2. Coreq: AST 1072, 2120 or 2122.*

AST 1074 Planetary Skies and Landscapes The surfaces and atmospheres of other worlds and how they compare to Earth with a focus on the physical processes which mold their landscapes and both generate and modify their gaseous atmospheres. The geology and meteorology of planets and their moons; the role of destructive collisions versus accretion and re-compaction. The effects of collisions with asteroids and comets, their role in mass extinctions, and in the possible formation of atmospheres and oceans; the search for planets and life in our solar system and beyond. **(3 cr)** *Sem 2. Prereq: AST 1072, 1073 for students completing their core science requirement. Coreq: AST 1075 for arts students completing their core science requirement.*

AST 1075 Planets Lab Laboratory focuses on planetary and solar system problems. **(1 cr)** *Sem 2. Coreq: AST 1074.*

AST 1151 Development of Astronomical Ideas The evolution (and revolution) of human views and understanding of the sky from pretechnology cultures (e.g., Stonehenge, the American

Southwest), through the sophisticated cultures of the ancient Near East, the ancient Greeks, the Renaissance (Copernicus, Galileo, Newton) and into the Twentieth Century. **(3 cr)** *Sem 1. Open to Arts and Science students as a free elective. Minimal mathematics.*

AST 2120 The Sun and the Stars A technical study of the Sun and other stars; their internal constitutions and atmospheres, life cycles and evolutionary processes, memberships in groups, the radiations they produce, and the manner in which astronomers quantify their characteristics. **(3 cr)** *Sem 2. Prereq: MAT 1500 or above; AST 2121 or 2122. Open to science, engineering and math majors. Non-astronomy majors may elect AST 1073 as a lab.*

AST 2121 Solar System Astronomy The science of the solar system: early ideas of the nature of the solar system; the dynamics and compositions of the planets; atmospheric evolution and maintenance. The manner with which comets and meteorites reveal the structures of the primitive solar system. **(3 cr)** *Sem 1. Prereq: MAT 1500 or above. For science, engineering and math majors. Non-Astronomy majors may elect AST 1071 as a lab.*

AST 2122 Galaxies and Cosmology The universe beyond the solar system: galactic structure, galactic evolution, and the current cosmological models of the large scale structure of the universe. **(3 cr)** *Sem 2. Prereq. or Coreq: MAT 1500 or above. For science, engineering and math majors. Non-Astronomy majors may elect AST 1073 as a lab.*

AST 2133 Observational Astronomy Lab I Astronomical instruments, methods of observing, reduction of observations, and discussion of astronomical data. Observations include CCD imaging, spectroscopy, and photoelectric photometry using the observatory reflector and Schmidt telescopes. Two hours per week in the laboratory in addition to the observing time necessary to complete the assigned projects. **(2 cr)** *Sem 1. Coreq: AST 2121.*

AST 2134 Observational Astronomy Lab II Continuation of AST 2133. **(2 cr)** *Sem 2. Prereq:*

AST 2133. Coreq: AST 2120.

AST 3121 Directed Studies I Studies in selected areas under the direction of a staff member. **(2 cr)**
Sem 1. Prereq: consent of chair.

AST 3122 Directed Studies II Studies in selected areas under the direction of a staff member. **(2 cr)**
Sem 2. Prereq: consent of chair.

AST 3131 Seminar in Astronomy and Astrophysics Seminar on special topics in Astronomy and Astrophysics. **(1 cr)** *Sem 1.*

AST 3141 Galactic Astronomy The nature, distribution, and motions of the constituents of the Galaxy -- the major star system in which our Sun is located -- the stars, the gas and dust, star clusters, etc.; stellar distance determination, distribution of stars and gas, stellar kinematics, galactic dynamics, galactic radio emission, cosmic rays, and evolution of galaxies. **(3 cr)** *Sem 1. Prereq: one year of mathematics or physics plus AST 2120 or 2122.*

AST 3142 Introduction to Stellar Astrophysics Theories of stellar atmospheres, line-broadening and formation, radiative transfer, theoretical spectra, and the theory of stellar interiors are covered. Fundamental stellar timescales, thermonuclear reactions, evolutionary models, stellar pulsations, novae and supernovae. **(3 cr)** *Sem 2. Prereq: AST 2120 or 2122, PHY 2410.*

AST 3152 Fundamentals of Astrodynamics Problems dealing with orbit determination, artificial satellites, space travel and related subjects. **(3 cr)**
Sem 2. Prereq: one year of mathematics or physics and AST 2121.

AST 4121 Undergraduate Research I Student participation in departmental or independent

research under faculty supervision; frequent conferences on literature search, research techniques, experimental procedures and results. **(3 cr)** *Sem 1. Prereq: consent of chair.*

AST 4122 Undergraduate Research II Continuation of AST 4121. **(3 cr)** *Sem 2. Prereq: consent of chair.*

METEOROLOGY

MET 1221 Fundamentals of Meteorology The science of meteorology in its present state of development with attention to the elements of weather and climate and related atmospheric processes; atmospheric circulation, wind, cloud formation, cyclones and anti-cyclones, weather analysis and interpretation, and the meteorological aspects of air pollution. **(3 cr)** *Sem 1. Prereq: one year of college mathematics.*

MET 1222 Meteorology and Climatology Fundamentals of climatology classification of climatic types and their distribution; the relation between the elements of weather and climate to biotic environment and human activities with special emphasis on air pollution. **(3 cr)** *Sem 1. Prereq: one year of college mathematics.*

MET 2001 Meteorology of the Planets The structure and chemistry of planetary atmospheres, scattering and absorption processes, radiative transfer and planetary spectra, convective and conductive processes, fundamental timescales for planetary atmospheres, dynamical meteorology, theories of climate evolution, accretion, fragmentation and origin of the solar system. **(3 cr)**
Sem 1. MAT 1505, PHY 2412.

BIOLOGY

Chair and Associate Professor: Baker

Professors: Bauer, Desmond, Gardner, Maksymowych,
Orkwiszewski, Stephens, Wieder

Associate Professors: Dollahon, Knepper,

Assistant Professors: Curry, DiBenedetto, Friede, Larsen,
Olson, Russell, Russo, Shurer, Webb

Instructor: Chubb

Office: 115 Mendel, tel. 519-4830

MAJOR: Thirty-six credits in Biology, including BIO 2105, 2106, 3351, and 5100. Cognate requirements include: CHM 1151/1103, 1152/1104, 2211/2201, 2212/2202; MAT 1310/1315; PHY 1100/1101 and 1102/1103. In addition, Biology majors must select a minimum of five laboratory science electives from the Biology departmental offerings (five courses including laboratories) numbered 3000 and higher. At least one course with laboratory must be chosen from each of the following areas: Population Biology, Organismal Biology, Cellular/Molecular Biology. *NOTE: Courses numbered below 2000 will not apply toward a major in biology.*

MINOR: Twenty-three credits Biology, including BIO 2105 and 2106. Additional elective courses from Biology departmental offerings numbered 3000 and higher. These Biology electives must include at least 3 lab science courses. Minors must complete at least 12 of their Biology credits at Villanova and achieve a minimum QPA of 2.0 in those courses.

NOTE: Courses numbered 7000 to 7999 are open to undergraduates with advanced standing and a QPA of 3.0 or higher. See the Biology listings in the Graduate School of Liberal Arts and Sciences Catalog.

BIO 1101 Biology General principles, cells and energy, hereditary mechanisms, survey of organisms, evolution and ecological principles. For non-biologists who do not plan a more extensive study of biology. *Cannot be used as the prerequisite for advanced courses in biology. May not be taken for credit by students who have completed BIO 2105 or 2106. (3 cr) Sem. 1&2.*

BIO 1181 Principles of Cell Biology and Genetics The structure of prokaryotic and eukaryotic cells; microbial classification; control of microbial growth, principles of disease; pathogenic mechanisms; host defenses. Eukaryotic and prokaryotic gene organization and function; analysis of patterns of inheritance; recombinant DNA technology; linkage and genetic maps, genetic variation in human populations; inheritance, diagnosis and treatment of metabolic disease; cytogenetics; immunogenetics; cancer; developmental genetics. **(3 cr) Prereq:** 1134. *Coreq: BIO 1205.*

BIO 1205 Human Anatomy and Physiology I Basic

concepts and laboratory studies of anatomy and physiology with presentation of overall morphology and function of the integumentary, skeletal, muscular, nervous, and endocrine systems. **(4 cr) Laboratory. Sem 1. Limited to Nursing students or permission of the department chair.**

BIO 1206 Human Anatomy and Physiology II Continuation of Biology 1205. The structure and function of the blood, vascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. **(4 cr) Sem 2. Prereq: Biology 1205. Laboratory. Limited to Nursing students or those with permission of the department chair.**

BIO 1401 Microbiology Fundamentals of structure, function, and characteristics of microorganisms and their interaction with host organisms; basic microbiological techniques carried out or demonstrated in laboratory. **(3 cr) Sem 2. Prereq: BIO 1505.**

BIO 1402 Microbiology Laboratory Basic

microbiological techniques carried out or demonstrated in laboratory. **(1 cr)** *Sem 2. Coreq: BIO 1401*

BIO 1505 Biology for Today Biology of cells, comparative animal physiology, genetics, reproduction and development, evolutionary biology and ecology. Experimental approaches used by biologists in problem solving. Writing assignments on the interpretation of science presented in the news media. **(4 cr)** *Laboratory. Sem 1. May not be taken for credit by students who have completed BIO 2105 or 2106.*

BIO 1555 Environmental Science and Human Concerns Fundamentals of ecology; energy use and alternatives for the future; mineral resources; population, food, nutrition, hunger; air and water pollution; pesticides; waste disposal; global warming; conservation. **(4 cr)** *Sem 2. Prereq: BIO 1505.*

BIO 1605 Heredity and Human Affairs Genetic variation in humans and human populations including metabolic diseases, chromosomal aberrations and cancer. Genetic aspects of biotechnology, biodiversity and environmental hazards. **(4 cr)** *Laboratory. Sem 2 Prereq: BIO 1505.*

BIO 1625 How Microbes Rule the World How microbes benefit humans through the recycling of elements and their uses in food and fuel production, water purification and detoxification of wastes. Microbes as the causative agents of disease and as agents to produce lifesaving cures through biotechnology. **(4 cr)** *Sem 2 Laboratory. Prereq: BIO 1505*

BIO 1655 Human Physiology - How Your Body Works The principles and mechanisms underlying how the human body functions, with emphasis on physical fitness. **(4 cr)** *Laboratory. Sem 2. Prereq: BIO 1505.*

BIO 1705 Life in the Sea Fundamentals of chemical, physical, and geological oceanography and their relationship to the evolution of marine organisms. The biology and ecology of marine algae, invertebrates, fishes and marine mammals. The

ecological dynamics of marine habitats including salt marshes, coral reefs and the deep sea. **(4 cr)** *Laboratory. Sem 2. Prereq: BIO 1505.*

BIO 2105 General Biology I An introduction to biological organization stressing the molecular and cellular aspects of living organisms. The chemistry of life, the cell, the gene, and mechanisms of evolution. **(4 cr)** *Laboratory. Sem 1.*

BIO 2106 General Biology II Continuation of Biology 2101. The origin of life and diversity of organisms seen in five biological kingdoms. Topics include nutrient acquisition, digestion, circulation, response to stimuli, movement, reproduction, behavior, and ecology. **(4 cr)** *Laboratory. Sem 2. Prereq: BIO 2105.*

BIO 3011 Animal Behavior Causation, development, ecology and evolution of behavioral patterns; behavioral genetics; neuroethology; communication; foraging territoriality; mating systems; parental behavior; social organization. Emphasis on ultimate explanations. **(3 cr)** *Sem 2, even years. Prereq: BIO 2105, 2106*

BIO 3012 Animal Behavior Laboratory Methods for observing behavior and for collection, statistical analysis, and interpretation of behavioral data. Exercises in lab and field, discussion, and small-group independent research projects. **(1 cr)** *Sem 2, even years. Prereq: BIO 2105, 2106. Coreq: BIO 3011.*

BIO 3055 Animal Physiology The basic principles underlying how animals function and the mechanisms used to solve physiological problems. **(4 cr)** *Laboratory. Sem 1&2. Prereq: BIO 2105, 2106.*

BIO 3105 Biometry Statistical treatment and interpretation of data obtained from biological experiments, emphasizing analytical procedures in relation to growth and development. **(4 cr)** *Laboratory. Sem 1. Prereq: BIO 2105, 2106.*

BIO 3155 Comparative Vertebrate Anatomy Evolution of homologous structures of vertebrates including functional considerations. Laboratory includes systematic and topical dissection of

representative chordates and demonstrations of living organisms' functions. **(4 cr)** *Sem 1. Prereq: BIO 2105, 2106.*

BIO 3225 Introduction to Electron Microscopy Introduction to specimen production for and use of scanning and transmission electron microscopes. **(4 cr)** *Sem 1, even years. Prereq: BIO 2105, 2106.*

BIO 3255 Introductory Ecology Factors affecting the distribution, abundance, and interactions of organisms. Climate patterns, biomes, physiological adaptation, population dynamics, behavioral ecology, species interactions, community structure, ecosystem function, and environmental problems. Hypothesis testing using statistical analysis of data. Required overnight trip. **(4 cr)** *Sem 1. Prereq: BIO 2105, 2106.*

BIO 3351 Genetics Transmission genetics, cytogenetics, gene expression and regulation and population genetics. **(3 cr)** *Sem 1&2. Prereq: BIO 2105, 2106; CHM 1103, 1151, 1104, 1152.*

BIO 3405 Higher Vertebrates Evolutionary history, diversification and basic biology of birds and mammals: ecological and physiological adaptations, reproductive biology, social behavior, population ecology, life history strategies, taxonomy and identification. Field trips. **(4 cr)** *Laboratory. Sem 1, even years. Prereq: BIO 2105, 2106.*

BIO 3455 Histology The microscopic study and demonstration of cells, tissues and organ systems of the mammalian body. **(4 cr)** *Sem 1. Prereq: BIO 2105, 2106.*

BIO 3505 Invertebrate Zoology The anatomy, taxonomy, evolution, physiology, development, ecology and behavior of invertebrates. The comparative approach in both field and laboratory. **(4 cr)** *Sem 1, even years. Prereq: BIO 2105, 2106.*

BIO 3555 Lower Vertebrates The biology of fishes, amphibians and reptiles: systematics and morphological diversity, physiological, reproductive and behavioral adaptations, ecology, and evolution. Required field trips to representative local habitats. **(4 cr)** *Laboratory. Sem 2, odd years. Prereq: BIO 2105, 2106.*

BIO 3595 General Microbiology Bacteria, viruses, eukaryotic microbes, immune function. Microbes in air, water, soil: interactions with plants and animals. Agricultural, commercial, industrial, and medical applications. Laboratory studies in growth and analysis of selected organisms/viruses. **(3 cr)** *Prereq: BIO 2105, 2106, CHM 1151, 1152. Coreq: 2211, 2201.*

BIO 3605 Microtechnique The principles and basic methods of preparing specimens for microscopic study; major techniques and recent developments. **(4 cr)** *Sem 2, odd years. Prereq: BIO 2105, 2106; CHM 1103, 1151, 1104, 1152; permission of department chair.*

BIO 3651 Non-Vascular Plants Physiology, comparative evolutionary trends, ecology, and morphology of Monera, photosynthetic Protists, Bryophytes, Fungi, and Lichens. **(2 cr)** *Sem 2. Prereq: BIO 2105, 2106.*

BIO 3652 Non-Vascular Plants Laboratory Physiological experimentation and microscopic study of Monera, photosynthetic Protists, Bryophytes, Fungi, and Lichens. **(2 cr)** *Sem 2. Prereq: BIO 2105, 2106 Coreq: BIO 3651.*

BIO 3755 Parasitology Biology of host-parasite relationships with emphasis on parasites of man and domestic animals. Methods of transmission, host response to parasites, prevention and treatment. **(4 cr)** *Laboratory. Sem 2, odd years. Prereq: BIO 2105, 2106.*

BIO 3801 Plant Physiology Physiology and metabolism of plants: photosynthesis, respiration, hormones, photoperiodism, radioisotopes in biological research, DNA biosynthesis and metabolism during plant development. **(2 cr)** *Sem 2. Prereq: BIO 2105, 2106.*

BIO 3802 Plant Physiology Laboratory Photosynthesis, respiration, hormones, extraction and characterization of DNA, DNA biosynthesis, autoradiographic techniques and liquid scintillation spectrometry. **(2 cr)** *Sem 2. Prereq: BIO 2105, 2106. Coreq: BIO 3801.*

BIO 3905 Structure and Development of Vascular

Plants Organization of the vascular plant body, plant reproduction and development, systematic and environmental considerations, tissue culture and hormonal regulation. **(4 cr)** *Sem 1. Prereq: BIO 2105, 2106.*

BIO 4105 Bacterial Pathogens and Pathogenesis The nature and activities of bacterial pathogens. Mechanisms of pathogenesis and invasiveness, and the physical evidence of infection and defense mechanisms of the host. Laboratory focus on isolation and identification methods and cultivation techniques. **(4 cr)** *Sem 2. Prereq: BIO 3595.*

BIO 4205 Biology of the Eukaryotic Cell The mechanisms of cell signaling, regulation of growth and division, adhesion, movement, macromolecular biosynthesis, processing and trafficking. Important experimental techniques and strategies for study of the eukaryotic cell. **(4 cr)** *Sem 1, even years. Prereq: BIO 2105, 2106, 3351; CHM 2211, 2212.*

BIO 4251 Comparative Endocrinology Mechanisms of endocrine control of growth, metabolism, reproduction, adaptation, and behavior. The endocrine glands. **(3 cr)** *Sem 2. Prereq: BIO 2105, 2106, 3055.*

BIO 4252 Comparative Endocrinology Laboratory Laboratory experience in endocrinology, demonstrative and analytical. **(1 cr)** *Sem 2. Prereq: BIO 2105, 2106. Coreq: BIO 4251.*

BIO 4285 Developmental Biology Mechanisms and patterns of vertebrate embryo development from primordial germ cells to formation of organ systems. Lectures on and laboratory work with living embryos; microscopic study of prepared embryos; and individual research projects. *Prereq: BIO 2105, 2106, 3351. (4 cr.) Sem 2.*

BIO 4305 Evolution Process and pattern from micro- and macro-evolutionary perspectives. Evolutionary genetics, natural selection, speciation, macroevolutionary trends, and extinctions. Field, laboratory, and computer approaches. **(4 cr)** *Sem 2, odd years. Prereq: BIO 2105, 2106, 3351.*

BIO 4355 Experimental Genetics Laboratory exploration and discussion of topics in bacterial,

developmental, molecular, population and transmission genetics. Readings in the primary literature are stressed. **(4 cr)** *Prereq: BIO 3351; MAT 1310-1315.*

BIO 4451 Field Ecology and Evolution Advanced study of organisms and ecosystems of a particular region (location varies; has included Florida, Puerto Rico, Nova Scotia). General principles explored using examples from focal area: historical and ecological biogeography, habitat patterns, biotic and abiotic interaction, evolutionary processes, and conservation problems. **(2 cr)** *Sem 2, even years. Prereq: BIO 2105, 2106, and either 3012 or 3255 or 4305 or permission of instructor.*

BIO 4452 Field Ecology and Evolution Laboratory Field study of organisms and ecosystems of a focal region. Trip lasting 15-20 days usually in late May to geographical area covered in BIO 4451, with focus on local habitats and conservations projects, field identification, group exercises, and independent research projects. Costs to students and timing vary with site chosen. **(2 cr)** *Sem, 2, even years. Prereq: BIO 2105, 2106. Coreq: BIO 4451.*

BIO 4485 Marine Biology Biology and ecology of marine organisms (algae, invertebrates, fishes, sea birds, marine mammals) the comparative ecology of marine communities and ecosystems (estuaries, rocky intertidal, kelp forests, coral reefs, the deep sea and hydrothermal vents) and basic principles of chemical, physical and geological oceanography. Required field trips. **(4 cr)** *Laboratory. Sem 2, even years. Prereq: BIO 2105, 2106, and 3505 or 3255 or 3555 or permission of instructor.*

BIO 4505 Molecular Biology DNA structure, replication, recombination, mutagenesis and repair, transcription, RNA processing, translation and the genetic code, control of gene expression, eukaryotic genome structure. Molecular aspects of immunity, cancer, and AIDS. Laboratory exercises in gene cloning and analysis. **(4 cr)** *Sem 2. Prereq: BIO 2105, 2106, 3351; CHM 2211, 2201, 2212, 2202.*

BIO 4605 Neurobiology The physiology of the nervous system using vertebrates and invertebrates. The function of nerve cells, synapses, sensory, motor, behavior and learning. **(4 cr)** *Laboratory.*

Sem 1. Prereq: BIO 2105, 2106 Prereq or Coreq: BIO 3055.

BIO 5100 Seminar Special topics in modern biology, presented by student lectures and informal discussions. Topics to be announced each semester. **(1 cr)** *Sem 1&2. Prereq: BIO 2105, 2106. Limited to senior status Biology majors.*

BIO 6409 Senior Thesis Directed laboratory research. Students will conduct original research and submit a written thesis. *Prereq: BIO 6509, senior status. (2 cr) Sem 1&2. Prereq: BIO 2105, 2106. Coreq or Post-req: Senior seminar*

BIO 6509 Directed Research Library and/or laboratory research under the direction of a student-selected Biology faculty member. Prerequisite for senior **(2 cr)** *Sem 1&2. Prereq: BIO 2105, 2106; consent of mentor; 3.0 QPA. Restricted to junior or senior biology majors. (No substitution for required biology laboratory courses.)*

BIO 6940 Special Topics in Biology Current topics in biology. Topics will be announced on a semester by semester basis. Specific information will be available in the department office. **(2 cr)** *Sem 1&2. Prereq: BIO 2105, 2106.*

CHEMISTRY

Chair and Professor: Giuliano

Professors: Busch, Doyne, Edwards, Wójcick, Zajac

Associate Professors: Cawley, Ludwig, Selinsky, Spritzer

Assistant Professors: Bausch, Bessel, Spadafora

Office: 205 Mendel, tel. 519-4840

MAJOR: CHM 1000; 1151/1105; 1152/1106; 3002; 3211/3201; 3212/3202; 3312; 3411/3401; 3412/3402; 3515/3505; 3516/3506; 4611; MAT 1500/1505/2500; and PHY 2410/2411; 2412/2413. In addition, Chemistry majors must select a minimum of two Chemistry electives and two Chemistry lab electives.

MINOR: CHM 1151/1103; 1152/1104; 2211/2201; and 2212/2202. In addition, Chemistry minors must select a minimum of three courses (along with appropriate laboratories) from the following Chemistry courses: 3002 and any course higher than 3300.

BIOCHEMISTRY CONCENTRATION: The first two years of this program are identical to the first two years of the chemistry major. The following courses must be successfully completed during the last two years: CHM 3002, 3411/3401, 3412/3402, 3514/3503, 4621/4622, 4603, 3312. In addition, this concentration requires a minimum of two chemistry electives along with their accompanying laboratories. The following elective courses may be taken: CHM 4623, BIO 4505, or a graduate biochemistry course (except 7693 and 7662).

RESEARCH OPPORTUNITIES IN THE CHEMISTRY DEPARTMENT: The Chemistry Department offers two mechanisms for participation in research by undergraduate major. Departmental fellowships for eight weeks of summer research are funded by local companies. Recipients of these fellowships carry out a research project under the direction of a faculty member. In addition, students may enroll in research for academic credit during the school year (CHM 4801, 4802, or 4803).

CHM 1000 Professional Development Seminars
Seminars are taken each semester for four years. The seminars are presented by visiting chemists, faculty, and students and cover the following topics: undergraduate research, career planning, the chemical industry, chemical safety, medicinal chemistry, pharmacology, etc. **(1 cr) Sem 1 & 2**

CHM 1001 Experimental Chemistry I Laboratory
Simple syntheses and quantitative measurements; separations and analysis of materials. By using some modern instrumentation the students will begin to see the power of experimentation and the scientific method. **(1 cr) Sem 1. Coreq: CHM 1021 or 1050. Two hours laboratory a week.**

CHM 1002 Experimental Chemistry II
This laboratory experience will continue to extend the students' knowledge of chemistry as an

experimental science. **(1 cr) Sem 2. Prereq: CHM 1001, and either CHM 1021 or 1050. Coreq: CHM 1022 or 1051-6. Two hours laboratory a week.**

CHM 1021 Chemistry: Principles and Practice I
For non-science majors. Basic principles of chemistry, illustration of how these are derived from experiments and application of the scientific method. Contemporary practical uses of chemistry and contemporary chemical based problems are used to illustrate principles learned and to show the role and limitations of chemistry in society. **(3 cr) Sem 1. Coreq: CHM 1001.**

CHM 1022 Chemistry: Principles and Practice II
Continuation of CHM 1021. Covers liquids, solids, solutions, acid-base, chemical kinetics, energy, oxidation-reduction, cell potentials, and organic chemistry. **(3 cr) Sem 2. Prereq: CHM 1001, CHM**

1021. Coreq: CHM 1002.

CHM 1050 Chemistry Themes: Foundations For non-science majors. The first semester in a two-semester sequence. The course covers basic concepts of measurement, the S.I. system of units, structure of atoms and of molecules, inorganic nomenclature, qualitative and quantitative aspects of chemical reactions, properties of gases, properties of solutions, principles of chemical equilibrium, acids and bases. (3 cr) Sem 1. Coreq: CHM 1001.

CHM 1051 Chemistry Themes: Chemistry and Energy For non-science majors. The role of chemistry in the production, storage and utilization of energy. Topics covered include basic thermochemistry, thermodynamics, organic chemistry, energy from combustion, electrochemistry, electrochemical energy production, nuclear chemistry, and other sources of energy (phase changes, wind and water power, solar energy, tidal power). (3 cr) For Non-Science majors. Sem 2. Prereq: CHM 1050, 1001. Coreq: CHM 1002.

CHM 1052 Chemistry Themes: Organic and Biological Chemistry For non-science majors. Introduction to alkanes, alkenes, arenes, amines, carboxylic acids, amino acids, carbohydrates, proteins and major metabolic pathways. Also includes topics in nutrition and exercise. (3 cr) Sem 2. Prereq: CHM 1050, 1001. Coreq: CHM 1002.

CHM 1053 Chemistry Themes: Atoms, Elements and Molecules For non-science majors. The experiments which led to the inception and evolution of the concepts of atoms, elements, and molecules will be examined. These samples give a grounding in the fundamentals of chemistry and an understanding of the logic which underlies the "scientific method". (3 cr) Sem 2. Prereq: CHM 1050, 1001. Coreq: CHM 1002.

CHM 1054 Chemistry Themes: Environmental Chemistry For non-science majors. Application of scientific laws, principles and concepts to the development of a basic understanding of the chemistry of the environment, its use and abuse, as it is affected by the quality of the air, water and soil;

and the impact of the increasing demands for earth's limited fossil, biological and mineral resources by an exponentially growing global population. (3 cr) Sem 2. Prereq: CHM 1050, 1001. Coreq: CHM 1002.

CHM 1055 Chemistry Themes: Architecture of Molecules For non-science majors. An historical development of the idea of three dimensional species at the molecular level; experimental verification, chiral species, electronically delocalized species, aromatic and anti-aromatic species, fluxional species, rigid, highly strained, unstable and metastable species. Current and future directions (e.g. "Buckyballs") as time allows. (3 cr) Sem 2. Prereq: CHM 1050, 1001. Coreq: CHM 1002.

CHM 1056 Chemistry Themes: Supermarket Chemistry For non-science majors. The chemistry of products found in the supermarket: food processing, food additives, soaps and detergents, cosmetics, and over-the-counter pharmaceuticals. (3 cr) Sem 2. Prereq: CHM 1050, 1001. Coreq: CHM 1002.

CHM 1103 General Chemistry Laboratory I Qualitative and quantitative laboratory experiments which include: the reactions of metals with water; the collection and plotting of data; acid-base titrations; oxidation-reduction titrations; the use of the pH meter and the determination of acid-base titration curves; the use of the spectrophotometer. (1 cr) Sem 1&2. Coreq: CHM 1131 or 1151.

CHM 1104 General Chemistry Laboratory II Students will be required to identify all metal ions present in an unknown solution. Quantitative titrations of sodium carbonate and the total hardness of water. Synthesis of inorganic compounds and determination of the formula of a transition metal complex ion using spectroscopic methods. (1 cr) Sem 2. Prereq: CHM 1103, CHM 1151. Coreq: CHM 1152.

CHM 1105 General Chemistry Laboratory Practice I Selected experiments designed to illustrate fundamental principles and techniques to train students in critical observation and deduction as well as in basic laboratory techniques and skills; emphasis on quantitative measurements. (1 cr)

Sem 1. Coreq: CHM 1151. Open only to Chemistry majors. Three hours laboratory a week.

CHM 1106 General Chemistry Laboratory Practice II A continuation of CHM 1105, with emphasis on principles of aqueous ionic equilibria as applied to identification of chemical substances, chemical synthesis, spectroscopy, chromatography, equilibrium, etc. **(1 cr)** *Sem 2. Prereq: CHM 1105, CHM 1152.. Coreq: CHM 1152. Open only to Chemistry majors. Three hours laboratory a week.*

CHM 1108 General Chemistry Laboratory II Chemistry of organic and biochemical compounds with an emphasis on the identification and chemical reactivities of functional groups. Students will be required to separate and identify various organic and biochemical compounds. **(1 cr)** *Sem 2. Prereq: CHM. 1131, 1103. Coreq: CHM 1134. Three hours laboratory a week.*

CHM 1131 General Chemistry I Fundamental laws and theories of chemistry: atomic theory, chemical bonding, chemical kinetics and chemical equilibrium, gases, liquids, solids, solutions, stoichiometry, acid-base theories, electrochemical concepts, and an introduction to nuclear chemistry will be included. **(3 cr)** *Sem 1&2. Coreq: CHM 1103. For health science students.*

CHM 1134 General Chemistry II Introduction to organic and biochemistry stressing the application of principles developed in CHM 1131. **(3 cr)** *Sem 2. Prereq: CHM 1131. Coreq: CHM 1108. For Health science students.*

CHM 1151 General Chemistry I Basic concepts of chemistry covering the following topics: properties of bulk matter; stoichiometry; colligative properties of solutions; thermochemistry; redox reactions; equilibrium and kinetics. **(4 cr)** *Sem 1. Coreq: CHM 1103 or 1105. For Majors in science and engineering..*

CHM 1152 General Chemistry II Descriptive presentation of atomic orbitals; molecular structure; chemical and physical trends in the periodic table; general descriptive chemistry of the elements; complex ions and factors that drive chemical reactions. **(4 cr)** *Sem 2. Prereq: CHM 1103 or*

1105, and 1151. For Majors in science and engineering.

CHM 2201 Organic Chemistry Laboratory I Practical experience in techniques used for separation, purification, and isolation of synthetic as well as naturally occurring organic compounds. Semi-micro and micro scale experiments. Crystallization, distillation, extraction, and chromatography are introduced. **(1 cr)** *Sem 1. Prereq: CHM 1104. Coreq: CHM 2211 or 3211. Three hours laboratory a week.*

CHM 2202 Organic Chemistry Lab II Further training in laboratory techniques used in organic chemistry, including those introduced in CHM 2201, and utilization of such techniques in representative types of organic reactions. **(1 cr)** *Sem 2. Prereq: CHM 2201. Coreq: CHM 2212 or 3212.*

CHM 2211 Organic Chemistry I Fundamental principles of organic chemistry stressing the relation of structure and reactivity. Structure and bonding; stereochemistry; acids, and bases; electrophilic addition, elimination and nucleophilic substitution. **(3 cr)** *Sem 1. Prereq: CHM 1152 and 1104. Coreq: CHM 2201*

CHM 2212 Organic Chemistry II Continuation of CHM 2211. Carbonyl group reactions, aromatic chemistry, spectroscopy and special topics such as heterocycles, carbohydrates and nucleosides, amino acids and proteins, lipids, radicals, rearrangements, polymers and photochemistry. **(3 cr)** *Sem 2. Prereq: CHM 2211, 2201. Coreq: CHM 2202.*

CHM 3002 Chemical Literature and Research A writing intensive course with training in the use of the chemical literature, in performing searches in Chemical Abstracts, in computer searches, in writing reports, research papers, grant proposals, and abstracts. One written report will also serve as the basis for an oral presentation. **(3 cr)** *Sem 2*

CHM 3201 Organic Chemistry Laboratory I Provides practical experience in the principal techniques utilized for the purification, separation, identification, and synthesis of organic compounds on the micro scale. **(2 cr)** *Sem 1. Prereq: CHM 1104 or 1106. Coreq: CHM 3211. Six hours*

laboratory a week.

CHM 3202 Organic Chemistry Laboratory II The semimicro techniques include distillation, recrystallization, extraction, sublimation, and chromatography. Synthesis of representative organic compounds. An introduction to research in organic chemistry, introduction to qualitative organic analysis and practical use of infrared and nuclear magnetic spectroscopies. **(2 cr) Sem 2.** *Prereq: CHM 3201. Coreq: CHM 3212. Six hours laboratory a week.*

CHM 3211 Organic Chemistry I Fundamental principles of organic chemistry stressing the relation of structure and reactivity from a physical-chemical viewpoint. Structure and bonding; stereochemistry; acids and bases; electrophilic addition reactions of alkenes, alkynes, and dienes; nucleophilic substitution reactions at saturated carbon atoms and elimination reactions leading to alkenes or alkynes. **(3 cr) Sem 1.** *Prereq: CHM 1152, and 1104 or 1106. Coreq: CHM 3201. Three hours lecture, one hour recitation a week.*

CHM 3212 Organic Chemistry II Addition and substitution reactions of carbonyl compounds, electrophilic and nucleophilic aromatic substitutions, radical and concerted reactions, heterocyclic compounds and polymer chemistry. Spectroscopic methods of analysis including nuclear magnetic resonance, infrared spectroscopies and mass spectrometry. Introduction to multi-step organic synthesis. **(3 cr) Sem 2.** *Prereq: CHM 3211. Coreq, CHM 3202. Three hours lecture, one hour recitation a week.*

CHM 3301 Inorganic Chemistry Laboratory This laboratory course emphasizes preparative techniques of inorganic compounds. Instrumental methods of structure elucidation are included. **(1 cr) Sem 2.** *Coreq: CHM. 3312. Three hours laboratory a week.*

CHM 3312 Descriptive Inorganic Chemistry Emphasis on practical aspects of chemical and industrial processes including recovery and refining of elements and their compounds. The periodic relationship of elements will be studied along with structure, bonding and stereochemistry of inorganic

chemicals. Acid-base theory and coordination chemistry will also be covered. **(3 cr) Sem 2.** *Prereq: CHM. 3411.*

CHM 3401 Physical Chemistry Laboratory I Use of the computer to design statistical package software for treatment of experimental data will be stressed in the two semester laboratory course. Phase and chemical equilibrium to supplement CHM. 3411 will be included. Gas chromatographic techniques will be used. **(1 cr) Sem 1.** *Prereq: CHM. 1104 or 1106. Coreq: CHM 3411 Three hours lectures a week*

CHM 3402 Physical Chemistry Laboratory II Experimental methods of chemical kinetics will be covered. Spectroscopic, polarimetric, and conductimetric methods will be used. **(1 cr) Sem 2.** *Prereq: CHM. 3401. Coreq: CHM. 3412. Three hours lecture a week.*

CHM 3411 Physical Chemistry I First, second, and third laws of thermodynamics; phase equilibria and chemical equilibria; gases; and electrochemistry will be covered in this course. **(3 cr) Sem 1.** *Prereq: CHM 1152, 1104 or 1106; MAT 1505. Coreq: CHM 3401. Three hours lecture, one hour recitation a week.*

CHM 3412 Physical Chemistry II The course will present an introduction to atomic and molecular structure and spectroscopy. The knowledge attained in these topics will be used to present the topics of chemical kinetics and chemical dynamics from the molecular point of view. **(3 cr) Sem 2.** *Prereq: CHM. 3411. Coreq: CHM. 3402.*

CHM 3503 Analytical Chemistry Laboratory Laboratory course to complement CHM. 3514; emphasis on the analysis of biological systems utilizing modern analytical techniques. **(1 cr) Sem 1.** *Coreq: CHM. 3514. Three hours laboratory a week.*

CHM 3505 Analytical Chemistry Laboratory I Designed to complement CHM. 3515. Laboratory experiments involving gravimetric, titrimetric and spectrophotometric methods are used to obtain quantitative data about the composition of various samples. **(2 cr) Sem 1.** *Prereq: CHM.1107, 1152.*

Coreq: CHM 3401, 3411, 3515. Four hours laboratory a week.

CHM 3506 Analytical Chemistry Laboratory II A complementary course for CHM. 3516. Emphasis on instrumental techniques to obtain quantitative data. Techniques such as spectroscopy, spectrochemical titrations, electroanalytical techniques (electrode position, polarography, coulometry, etc.) and separation techniques (gas chromatography and liquid chromatography). **(2 cr)** *Sem 2. Prereq: CHM 3505. Coreq: CHM 3402, 3412, 3516. Four hours laboratory a week.*

CHM 3514 Analytical Chemistry Designed for the biochemistry concentration with emphasis on theory, instrumentation and practical applications of analytical chemistry to biological materials. **(3 cr)** *Sem 1. Prereq: general chemistry, organic chemistry.*

CHM 3515 Analytical Chemistry I Fundamentals of modern analytical chemistry with emphasis on data collection and analysis, evaluation of error, extensive treatment of equilibria in simple and complex systems. Examination of gravimetric and titrimetric methods. Introduction to spectroscopy. **(3 cr)** *Sem 1. Prereq: CHM 1007, 1152, 3212, 3202. Coreq: CHM 3401, 3411, 3505.*

CHM 3516 Analytical Chemistry II Quantitative instrumental analysis theory and its application to the analysis of common laboratory samples, environmental samples, and forensic samples. The application of reaction rates to analytical chemistry. Topics such as optical methods, electroanalytical techniques, and chromatographic techniques are stressed. **(3 cr)** *Sem 2. Prereq: CHM 3505 and 3515. Coreq: CHM 3402, 3412, 3506.*

CHM. 4202 Organic Analysis Laboratory Laboratory experiments involving separations by modern chromatographic techniques including thin layer, radial, flash, and high performance liquid chromatography. Multistep syntheses of organic compounds with experiments chosen from the chemical literature. Characterization of organic compounds by advanced spectroscopic methods. **(2 cr)** *Sem 2. Coreq: CHM 4222. Two three-hour laboratory periods a week.*

CHM 4222 Organic Analysis Spectroscopic methodology for the determination of structure of static, as well as, dynamic molecular systems. Proton and carbon-13 nuclear magnetic resonance spectroscopy, mass spectrometry, infrared, ultraviolet-visible, and optical rotatory dispersion-circular dichroism will also be presented. **(3 cr)** *Sem 2. Prereq: CHM. 3212, 3202, 3412, or equivalent.*

CHM 4413 Spectroscopy and Structure Use of the fundamental principles of atomic and molecular structure to study ultraviolet, infrared, microwave and magnetic resonance spectroscopies. Continuous-wave and Fourier transform methods will be included along with fluorescence, phosphorescence and laser spectroscopic techniques. **(3 cr)** *Sem 1. Prereq: PHY 2410 and 2412.*

CHM 4503 Computer Interfacing Laboratory This course will apply some of the techniques of interfacing of chemical instruments with digital computers that have been covered in CHM 4513. **(1 cr)** *Sem 2. Coreq: CHM. 4513. Three hours laboratory a week.*

CHM 4513 Computer Interfacing in Chemistry Principles involved in the interconnection of laboratory equipment to computers with emphasis on chemical systems. Topic covered will include computer fundamentals, analog and digital signal handling, timing and sequencing, sampling, analog/digital conversion, noise and interference, signal conditioning, data communications, graphics, selected computational techniques. **(3 cr)** *Sem 2. Prereq: CHM 1107, 3506, or equivalent; and CHM. 3412.*

CHM 4601 Biochemistry Laboratory An introduction to laboratory techniques in biochemistry; enzyme kinetics, column chromatography, electrophoresis, standard biochemical assays and interpretation of data. **(1 cr)** *Sem 2. Prereq: CHM 2202 or 3202 and CHM 4611. Three hours of laboratory a week.*

CHM 4603 Biochemistry Techniques and Practices A laboratory course to complement CHM 4621.

Emphasis on enzyme purification, enzyme characterization, nucleic acid analysis, polysaccharide analysis and coupled enzyme systems. **(2 cr)** *Sem 1. Prereq: CHM. 2212, 3212 and 4621. Coreq: CHM 4622. Two three hour laboratories a week.*

CHM 4611 Introductory Biochemistry Basic areas of biochemistry; carbohydrates, lipids, proteins, nucleic acids, enzymes, vitamins and hormones; consideration of their utilization and metabolism in living systems. **(3 cr)** *Sem 1. Prereq: CHM 2212 or 3212.*

CHM 4621 Biochemistry I An in depth study of the structure and function of proteins, enzymes, carbohydrates, nucleic acids and lipids. **(3 cr)** *Sem 2. Prereq: CHM 2212 or 3212.*

CHM 4622 Biochemistry II Continuation of CHM 4621 with major emphasis on the metabolic pathways of carbohydrates, fats, steroids, amino acids and nucleotides. Metabolic controls of the pathways is stressed. **(3 cr)** *Sem 1. Prereq: CHM 4621. Coreq: CHM 4603.*

CHM 4623 Biochemistry III Integration of metabolism in organisms, membrane receptors, expression of genes, gene manipulation, translation, transcripts, etc. **(3 cr)** *Sem 2. Prereq: CHM 4622.*

CHM 4801 Undergraduate Research I Student participation in independent research under faculty supervision, frequent conferences with adviser on literature search, theoretical and experimental research techniques. Writing enriched. **(3 cr)** *Sem 1. Prereq: approval of undergraduate committee and acceptance by proposed adviser. Hours of research a week determined by agreement between student and adviser.*

CHM 4802 Undergraduate Research II Continuation of CHM 4801. Writing enriched. **(3 cr)** *Sem 2*

CHM 4803 Undergraduate Research III Continuation of CHM 4802. Writing enriched. **(3 cr)** *Sem 2*

CLASSICAL STUDIES

Chair and Professor: Hunt
Assistant Professor: Jaworowski
Location: 320 St. Augustine Center, tel. 519 4780

MAJOR: A major in Classical Studies generally requires a minimum of 12 courses, (minimum 36 credits) in Latin or Greek. Up to 2 Classics courses (taught in English: Archaeology, Mythology, etc.) may be included in the 12 course total. Classics 3001, Independent Study, will be considered a Latin or Greek course when the study is done in these languages.

MINOR: A minor in Classical Studies generally requires a minimum of 6 courses (minimum 18 credits) in Latin or Greek. Up to 2 Classics courses (taught in English: Archaeology, Mythology, etc.) may be included in the 6 course total. Classics 3001, Independent Study, will be considered a Latin or Greek course when the study is done in these languages.

CLASSICS

CLA 2021 Language of Science and Medicine Greek and Latin prefixes, roots, and suffixes in modern vocabulary; vocabulary building, with

emphasis on technical terminology in scientific and medical usage. Knowledge of the languages is not required. **(3 cr)** *Sem 1.*

CLA 2032 Classical Mythology The myths, legends and folklore of the Greeks and Romans as they developed in their life, thought and literature; their influence on the Renaissance and modern times. (3 cr) *Sem 1&2.*

CLA 2051 The Cities of Ancient Greece Classical archaeology and architecture of Greece. Selected sites in the Greek world with emphasis on their architectural, artistic and history significance. (3 cr) *Sem 1.*

CLA 2052 Rome: The Ancient City Classical archaeology and architecture of Italy. Selected sites in the Roman world with emphasis on their architectural, artistic and historical significance. (3 cr) *Sem 2.*

CLA 3001 Independent Study in Classics Reading of selected material in Latin or Greek or in classical literature in translation under the direction of a member of the staff. (3 cr) *Sem 1&2; Prereq: Consent of instructor. May be repeated for credit.*

CLA 3040 Studies in the Classics Selected themes of special interest. Topics vary according to interests of students and instructor: e.g. Women in the Classical World, Slavery in the Ancient World, Classical Rhetoric, etc. (3 cr) *Sem 1&2.*

CLA 3052 Roman Law The origins, nature, and history of Roman Law during the Republic and Empire; evolution of the court system; civil and criminal codes; judicial procedure; social, business and economic institutions and the law; government and administration of the empire. (3 cr) *Sem 2.*

GREEK

GRK 1001, 1002 Introductory Greek (Ancient) I and II The basic forms, syntax and vocabulary of Ancient Attic Greek; selected prose in second semester. (10 cr) *Sem 1&2; GRK 1001 or permission of chair is the prerequisite for GRK 1002. This sequence fulfills Arts and Sciences language requirement.*

GRK 1051, 1052 New Testament Greek I and II Essentials of the grammar, syntax and vocabulary of the Greek of the New Testament. Reading and writing of simple New Testament Greek. (10 cr)

Sem 1&2. Prereq. for GRK 1052: GRK 1051 or permission of chair. This sequence fulfills Arts and Science language requirement.

GRK 3001 Readings in Authors Selected readings from a variety of Greek authors. (3 cr) *Sem 1.*

GRK 4250 Greek Historians Selections from the works of Herodotus, Thucydides, or Polybius. (3 cr) *Sem 1.*

GRK 4350 Greek Orators Selected Orations; the style and structure of the speeches, their relations to the historical occasions for which they were composed, and the contribution of rhetoric to the intellectual life of the fourth century. (3 cr) *Sem 2.*

GRK 4450 Greek Philosophers Greek philosophical thought and its vehicle, the Greek language, based on the reading of texts in the original. (3 cr) *Sem 2.*

GRK 5250 Homer Introduction to Homeric Greek and a study of Homeric epics. *Sem 2*

GRK 5850 Greek Tragedy Selected plays, read and interpreted in the light of contemporary Greek institutions and thought, with attention to their poetic and dramatic structure. (3 cr) *Sem 2.*

GRK 5950 Greek Comedy Selected plays, read and interpreted in the light of contemporary Greek institutions and thought, with special attention to their poetic and dramatic structure. (3 cr) *Sem 2.*

LATIN

LAT 1001, 1002 Introductory Latin I and II Basic forms, syntax and vocabulary; selected Latin prose in second semester. (6 cr) *Sem 1&2 For students with no Latin or with only one year of high school Latin, LAT 1001 or permission of chair, is the prerequisite for LAT 1002. Students taking LAT 1001 and/or 1002 must take six other credits in Intermediate Latin to fulfill the requirements of the Bachelor of Arts degree if they select Latin to fulfill the foreign language requirements.*

LAT 2031, 2032 Intermediate Latin I and II Review of Latin syntax; selected readings from prose and

poetry. Lat. 2031 or permission of chairperson is prerequisite for Lat. 2032. **(6 cr)** *Sem 1&2.*

LAT 3001 Readings in Authors Selected readings from a variety of Latin authors. **(3 cr)** *Sem 1.*

LAT 3050 Prose Composition Practice in the composition of Latin in a variety of styles. **(3 cr)** *Sem 1.*

LAT 3150 The Latin Language Historical Latin grammar and syntax; the syntax of classical Latin. **(3 cr)** *Sem 1.*

LAT 4051 Cicero Reading of selected orations with special emphasis on the historical background. Selection from rhetorical and philosophical works and letters. **(3 cr)** *Sem 1.*

LAT 4150 Caesar Reading and interpretation of Julius Caesar's commentaries. **(3 cr)** *Sem 1.*

LAT 4350 Livy Extensive reading in the *Ab Urbe Condita*; Livy as historian of Rome. **(3 cr)** *Sem 1.*

LAT 4450 Tacitus Extensive reading in the *Annales*; Tacitus as historian of the early principate.

(3 cr) *Sem 1.*

LAT 4550 Suetonius Reading of the major Lives; Suetonius's conception of biography, the historical and literary value of the Lives. **(3 cr)** *Sem 2.*

LAT 5050 Plautus and Terence The nature of Roman comedy. **(3 cr)** *Sem 1.*

LAT 5250 Vergil The Aeneid, read and interpreted in the light of ancient poetical theory and the epic tradition; the civilized epic as a new form; Vergilian epic techniques; careful reading of selections from the *Eclogues* and *Georgics*. **(3 cr)** *Sem 2.*

LAT 5350 Ovid Ovid as an epic poet of the Augustan age. **(3 cr)** *Sem 1.*

LAT 5450 Horace Augustan lyric and satire. **(3 cr)** *Sem 2.*

LAT 6001 Seminar A reading, research, and conference course on selected topics of Roman literature and history; introduction to research in classical studies. **(3 cr)** *Sem 2.*

COMMUNICATION

Chair and Professor: Nance

Professor: Lynch

Associate Professors: Bowen, Mackey-Kallis, Michal-Johnson, Shyles

Assistant Professors: Crable, Rose, Wilke

Instructors: Berens, Blanche, O'Leary, Templeton

MAJOR: Thirty (30) credit hours are required. CA 1000, Survey of Communication Studies, and CA 1100, Public Speaking, are prerequisites which must be taken in the sophomore year. CA 5000, Communication Research, should be taken in the junior year or prior to taking CA 5050, Senior Project.

After completing CA 1000 and declaring the Communication major, students will consult their academic advisers and choose one of three areas of emphasis: Rhetoric & Performance Studies (2000 -2950), Media & Film Studies (3000 -3950), and Interpersonal and Organizational Studies (4000 - 4950). They will take three courses in the area of emphasis, one course in each of the other two areas, and one additional course in an area of their choice to complete the major. A complete listing of courses divided by area of emphasis is available in the Communication office.

Communication majors who choose internships may apply three credits to satisfy major requirements. If more internship credits are taken, they must be free electives.

MINOR: Survey of Communication Studies (C.A. 1000), plus four courses from the major course offerings.

CA 1000 Survey of Communication Studies

Process of communication; range of perspectives from which communication can be studied (from classical rhetoric to contemporary theory); the functions communication serves; and the forms of communication such as interpersonal, small group, organizational, public address, and mass media. **(3 cr)**

CA 1100 Public Speaking Principles of communication related to speech composition and delivery; finding, analyzing, organizing and presenting material in ways appropriate to and effective with listeners. **(3 cr)**

AREA ONE:

RHETORIC AND PERFORMANCE STUDIES

CA 2000 Voice and Diction Improvement of vocal quality and articulation through study of vocal anatomy, phonetics, projection, and expressiveness. Emphasis on live and taped performances of readings. **(3 cr)**

CA 2050 Performance of Literature Study of literary texts through performance; the development of presentational skills and skills in critical reading, writing, listening and analysis of performance; combines elements of theater, literature, and communication. **(3 cr)**

CA 2100 Advanced Speaking and Speechwriting Intensive study of oral style and content; introduction to rhetorical theory and criticism; utilizing these concepts to prepare and deliver speeches. **(3 cr)** *Prereq: C.A. 1100 or permission of instructor.*

CA 2150 Storybuilding for the Camera

Development of narrative strategies through improvisation and techniques of mediated visualization using video. (3 cr)

CA 2210 Rhetoric and Public Discourse Theories, genres, contexts, and critical methodologies of rhetorical discourse. Reading and analysis of significant texts in order to appreciate their role in shaping the ideas, ideals, and institutions of society. (3 cr)

CA 2250 Argumentation and Debate

Argumentation theory and practice, emphasizing the construction of well-reasoned arguments and attacks on and defense of arguments. Participation in a number of in-class debates. (3 cr)

CA 2310 Black Rhetoric African-American public address from pre-colonial America through the present; major rhetorical strategies used by African-American speakers. (3 cr)

ENG. 2020 Interpretive Journalism News gathering and news writing; principles, rules and techniques of effective editorial writings; practical experience in the actual writing of news stories and editorials. (3 cr) *Limited to 20 students. Permission of instructor required.*

CA 2410 Campus Newspaper Practicum Practical experience in running a professional newspaper, the *Villanovan*, including experience in news gathering, story development, editing, copy reading, layout, graphics and the business aspects of a newspaper - accounts, advertising and costs. (3 cr) *Prerequisite: ENG. 2020 and permission of instructor.*

CA 2450 Media and Politics Examination of political communication research, theory and history. A particular focus on the role of media, such as advertising and news reporting, on political campaigns and policymaking. (3 cr)

CA 2510 Broadcast Performance Styles and techniques of broadcast journalism performance, including studio and location reporting and interviewing. Historical and contemporary trends in

broadcast journalism. (3 cr)

AREA TWO:

MEDIA AND FILM STUDIES

CA 3000 Mass Communication Studies Structure and content of the major media industries in America (radio, television, film, newspapers, magazines, recordings, and books), and how each interacts with individuals, groups, and institutions. Students analyze and critique media systems and content in terms of social, legal, political, and economic forces that influence them. (3 cr)

CA 3050 Public Relations Theories behind the practice of public relations as well as a working knowledge in public relations strategy planning. Restricted to Communication majors and minors or permission of chairperson. (3 cr)

CA 3100 Advertising Strategies and techniques used in contemporary American advertising: consumer behavior, market research and analysis, message development for print and broadcast, and media selection. (3 cr) *Restricted to Communication majors and minors or permission of chairperson.*

CA 3150 Broadcast Writing Develop broadcast writing skills through a series of assignments including promotional and public service announcements and commercials. (3 cr)

CA 3210 Television Production In-studio workshop that deals with basic television production techniques, such as equipment, production of commercials, dramatic scenes and news. Discussion of current problems in the management and operation of a television broadcasting station. (3 cr)

CA 3250 Advanced Television Production Extends students' knowledge of basic television production; involves the writing, planning, and creation of varied formats of television programming, culminating in a semester project intended for broadcast or other media outlet (3 cr) *Prerequisite: CA 3210 or permission of instructor.*

CA 3300 Programming for Radio and Television Process of evaluation, selection and scheduling of

programming for television, radio and cable TV. **(3 cr)**

CA 3310 Broadcast Management and Sales Sales and management as part of the broadcast industry; management theory and communication theory; interpersonal dynamics of the selling environment and management roles. **(3 cr)**

CA 3350 Film Analysis Methods and perspectives used to analyze visual media drawing on contemporary and historically important films. Historical, theoretical, and aesthetic approaches to film analysis, as well as the social, political and economic forces that influence film content. **(3 cr)**
Requires outside viewing.

CA 3400 Film History Evolution of film as an art form; includes the impact of technology. **(3 cr)**
Requires outside viewing.

CA 3450 International Cinema Study of the film of or about a particular country with emphasis on political, social, cultural and artistic issues. **(3 cr)**
Requires outside viewing.

CA 3510 Contemporary Cinema Seminar course in which various strategies are applied to the analysis of contemporary films. **(3 cr)** *Requires outside viewing.*

CA 3550 Film Genre Study Exploration of a particular genre's significance within film history and its reflection of contemporary political, social, and cultural issues. **(3 cr)** *Requires outside viewing.*

CA 3650 The Film Auteur Intensive chronological study of the work of one European or American film director. **(3 cr)** *Requires outside viewing.*

CA 3700 Women and Film Historical survey of American film from a feminist perspective. Study of American and foreign women directors. **(3 cr)**
Requires outside viewing.

CA 3750 Families on Film Study of films which focus on the dynamics of family communication using the semiological, psychoanalytic, phenomenological and family communication theory approaches. **(3cr)** *Requires outside viewing.*

CA 3800 Media Criticism Analysis of contemporary film, television, music, print media and electronic media from a cultural studies perspective. **(3 cr)**

AREA THREE:

INTERPERSONAL AND ORGANIZATIONAL STUDIES

CA 4000 Interpersonal Communication Studies Strategies, roles and rules that characterize everyday communication between people. Critical examination of the communicative aspects of interpersonal relationships. Experiential activities augment lectures/discussions. **(3 cr)**

CA 4050 Small Group Communication Theory and practice of communication for idea generation and problem-solving in groups and in multiple contexts. **(3 cr)**

CA 4100 Speech Communication in the Classroom Role of communication in the contemporary classroom; classroom skills of lecturing, discussing, demonstrating and oral reading; communication strategies to achieve classroom discipline. **(3 cr)**

CA 4150 Gender and Communication Communication of women and men against the backdrop of society and feminism in such communicative contexts as families, schools, friendships and relationships, organizations, media, and technology. **(3 cr)**

CA 4200 Intercultural Communication Communication theories and models of how discourse functions in relation to psychological, social and cultural realities. **(3 cr)**

CA 4250 Organizational Communication Role of communication in organizing; supervisory-subordinate relationships, group relationships, organizational culture and communication networks, communication technologies, communication based training and development, and human resource applications. **(3 cr)**

ADDITIONAL COURSES

CA 2800 Directed Study Supervised project culminating in term report. (3 cr) *Permission of Chairperson.*

CA 2993 Communication Internship Supervised work/study program in radio, television, advertising, publicity or public relations. (3 cr)

CA 2996 Communication Internship More intensive, in depth work/study program in radio, television, advertising, publicity or public relations. (3 cr)

CA 3500 Special Topics in Communication A topic or problem in Communication selected by the instructor. (3 cr)

CA 5000 Communication Research Reading and

designing research in communication through gathering and critically analyzing literature in the field and introduction of the chief methods used in communication studies. (3 cr)

CA 5050 Senior Project Design, implementation, and presentation of a group research project in which students apply the knowledge and skills learned through the Communication program of study to the investigation of rhetorical or communication phenomena. (3 cr) *Restricted to Communication seniors. Prerequisite: CA 5000.*

CA 5100 Directed Study Supervised project culminating in term report. (3 cr)

CA 5150 Special Topics in Communication A topic or problem in Communication selected by the instructor. (3 cr)

COMPUTING SCIENCES

Chair and Professor: Beck

Professors: Cassel, Fleischman

Associate Professors: Goelman, Levitin, Lewis, Joyce, Soong

Assistant Professors: Gormley, Hardt, Papalaskari,

Office: 161 Mendel, tel. 519-7307

MAJOR: CSC 1051, 1052, 1200, 1300, 1600, 1700, 1800, 4170 and 4700; MAT 1500, 1505, and 2310; plus five departmentally approved elective courses in computer science; PHI 2180; a two-semester science sequence with corequisite laboratories, selected from an approved set of courses in Astronomy, Biology, Chemistry or Physics; and one more approved science or engineering courses. A specific list of approved electives and approved science/engineering courses can be obtained from the department office. A total of 26 credits in science and mathematics is required. French, German, or Russian is recommended to fulfill the core language requirement. The major in computer science is accredited by the Computer Science Accreditation Commission of the Computing Sciences Accreditation Board, a specialized accrediting body.

MINOR: CSC 1051, 1052, 1200 or ECE 2490, CSC 1300, and three elective courses chosen from the list of approved courses available from the department office.

CSC 1010 Tools for Text A unified view of the powerful tools for manipulating text and the algorithms they implement; complexity and security of operations on text; locating and searching online text databases and bibliographies via the Internet; alternative text structures: hypertext, multimedia;

alternative input techniques: scanning, voice. (3 cr)
Two hours lecture, two hours laboratory per week.

CSC 1020 Fundamentals of Computing Systems Information representation and manipulation; file systems and directories; compatibility and data

exchange; security and privacy; elements of computer architectures and operating systems; computer networks, the Internet, and the World Wide Web; PC based examples and illustrations. **(3 cr)** *Two hours lecture, two hours laboratory per week.*

CSC 1024 Computing for Scientists Active learning of computing skills necessary for science students: data graphing, regression analysis, animation, symbolic computing, information search techniques, scientific report writing, Web page construction, fundamentals of programming. **(1 cr)**

CSC 1030 Problem Solving With Computers Using the microcomputer as a problem solving tool; system use; general purpose language programming; spreadsheet analysis and modeling; retrieving information from the Internet; strengths and weaknesses of computer based problem solutions. **(3 cr)** *Two hours lecture, two hours laboratory per week.*

CSC 1040 Computing with Images Computing systems as tools for design and publishing of graphically-rich material in many forms: Image processing techniques and systems; image style and related tools; digital image processing theory; computational complexity; multimedia. **(3 cr)** *Sem 1&2.*

CSC 1051 Algorithms and Data Structures I Problem analysis; algorithm design and refinement; extensive programming using an object-oriented language such as Java or C++; loops, selection, objects, classes, arrays, strings, inheritance; basic sorting and searching. **(4 cr)**

CSC 1052 Algorithms and Data Structures II Abstract data types: dynamically linked structures; recursion; lists, stacks, queues, trees, graphs; advanced sorting and searching; requires extensive programming. **(4 cr)** *Prereq: CSC 1051.*

CSC 1200 Computer Organization Computer structure; central processing unit; binary number representation and arithmetic; digital logic design; storage units; machine language; introduction to assembly language. **(3 cr)** *Prereq: CSC 1052, 1300.*

CSC 1300 Discrete Structures Mathematical structures that support computer science: sets, logic and proof, mathematical induction, relations, functions, counting techniques, probability, boolean algebra, matrices, graphs and trees. **(3 cr each)** *Coreq for CSC 1300: CSC 1052.*

CSC 1600 Operating Systems System software design and implementation; process and resource management; concurrency, scheduling, and deadlock; memory management; file systems and security. **(3 cr)** *Prereq: CSC 1200*

CSC 1700 Design and Analysis of Algorithms Efficiency classifications and mathematical analysis of recursive and nonrecursive algorithms: sorting, searching, string processing, graphs, arithmetic; parallelism. **(3 cr)** *Prereq: CSC 1052, 1300.*

CSC 1800 Organization of Programming Languages High level language features: data types, control structures; formal lexical and syntactical analysis; operational semantics; language translation. **(3 cr)** *Prereq: CSC 1052, 1300.*

CSC 2993 Computer Science Internship Internship in computer science open to second semester sophomores and above. Most likely, intern will participate in computer system development, maintenance, or evaluation in an environment which supports sound software engineering techniques. **(3 cr)**

CSC 2996 Computer Science Internship Internship in computer science open to second semester sophomores and above. Most likely, intern will participate in computer system development, maintenance, or evaluation in an environment which supports sound software engineering techniques. **(6 cr)**

CSC 4170 Theory of Computation Finite automata and regular expressions; push down automata and context-free grammars; Turing machines; Church's thesis; computability; NP-completeness. **(3 cr)** *Prereq: CSC 1700.*

CSC 4200 Advanced Algorithms and Complexity Greedy algorithms, divide-and-conquer; dynamic

programming; backtracking; branch-and-bound; linear and integer linear programming; Fast Fourier transform, probabilistic algorithms; NP-complete problems and approximation methods. **(3 cr)**
Prereq: CSC 1700.

CSC 4280 Parallel Algorithms and Architecture Design and analysis of parallel algorithms for arithmetic, matrix operations, sorting, simulation, combinatorial and graph problems, and Fast Fourier Transform. Taxonomies of parallel architectures; interconnection networks, meshes, trees, and hypercubes; scalability and speed-up. **(3 cr)**
Prereq: CSC 1600, 1700.

CSC 4300 Computer Graphics Hardware and software in computer graphics; graphics programming language; input/output device handling; modeling in 3D space; development of interactive software. **(3 cr)** *Prereq: CSC 1052, 1300.*

CSC 4380 Information Visualization The presentation of information; project based-course. Possible topics: visual cognition, scientific visualization, illustration presentation, color theory, motion dynamics, image processing. **(3 cr)** *Prereq: CSC 1052, 1300.*

CSC 4400 Microprocessors Introduction to 8-, 16-, and 32-bit microprocessors; programming model; system architecture and software; instruction sets; addressing modes; input-output protocols; interrupt handling; RISC architecture. **(3 cr)**
Prereq: CSC 1200.

CSC 4500 Introduction to Artificial Intelligence The nature of intelligence and the question of its computer implementation; search algorithms; knowledge representation; automated deduction; natural language understanding; planning; problem solving. **(3 cr)** *Prereq: CSC 1700.*

CSC 4600 Distributed Processing Systems Data concurrency; distributed file systems and database; distributed operating systems; security; interprocess communication; directory services; process migration; process vulnerability to partial failure. **(3 cr)** *Prereq: CSC 1600*

CSC 4630 Software Development and Systems Operating system structures; system calls; system libraries; interprocess communication; user-interface programming environments; software utilities; software portability. **(3 cr)** *Prereq: CSC 1600.*

CSC 4700 Software Engineering Management and production of software systems; the software life cycle; software design techniques and methodologies; completion of a team software development project. **(3 cr)** *Prereq: CSC 1700.*

CSC 4730 Human-Computer Interaction Design of the user/system interface; measurement of human-computer interaction; models of the user and user communities; design criteria for the interface; user interface management systems (UIMS); test and evaluation strategies and tools. **(3 cr)** *Prereq: CSC 1052, 1300.*

CSC 4780 Principles of Database Systems Concepts and technology of database management systems; data modeling with an emphasis on the relational model; database querying and normalization; physical data organization. **(3 cr)**
Prereq: CSC 1052, 1300.

CSC 4811 Compiler Construction Lexical and syntactical analysis; code generation; error recovery; recursive descent compilation; handling of run time environment. **(3 cr)** *Prereq: CSC 1200, 1800.*

CSC 4900 Computer Networks Application development over the TCP/IP and OSI network environments; client server computing; use of the WWW as a distributed platform; hypermedia; directories; network protocols; authentication and authorization. **(3 cr)** *Prereq: CSC 1600.*

CSC 5900 Seminar in Computer Science Study and discussion of selected topics in computer science with presentations by individual students. May be repeated for credit if topics are different. **(3 cr)** *Prereq: CSC 1052, 1300. Additional prerequisites may be imposed depending on the topic of the seminar.*

CSC 5930 Topics in Computer Science Lecture presentation of selected topics in computer science.

College of Liberal Arts and Sciences

May be repeated for credit if topics are different. **(3 cr)** *Prereq: CSC 1052, 1300. Additional prerequisites may be imposed depending on the topic of the course.*

CSC 5993 Independent Study Reading, research and/or projects in a selected area of computer science under the direction of a member of the staff. May be repeated for credit. **(3 cr)** *Prereq: consent of instructor.*

CORE HUMANITIES

Coordinator and Professor: Doody

Office: 104 St. Augustine Center, tel. 519-7325

The College of Liberal Arts and Sciences is committed to the view that the humanities play an essential role in university education by stimulating intellectual wonder, broadening cultural awareness, helping us examine moral values, and strengthening our search for a just and humane society. All Arts and Sciences students have an intensive exposure to the humanities in their Core Humanities Seminar in each semester of the first college year.

CHS 1000 Ancient, Medieval and Renaissance Thought A Humanities seminar based principally on texts and readings drawn from primary sources up to 1650. Extensive written work and seminar discussions. Required readings: Hebrew and Christian scriptures, selections from the works of Augustine, Shakespeare, Medieval and Renaissance works. Readings from different genres and disciplines. Themes developed by the instructor in accordance with the selected readings. **(3 cr)**

Present A Humanities seminar based principally on texts and readings drawn from primary sources 1650 to the present. Extensive written work and seminar discussions. Readings from each of the following five historical eras: Early Modern, Enlightenment, Romantic, Modernist, Contemporary. Readings will also reflect different genres and disciplines. Themes developed by the instructor in accordance with the selected readings, including a specific Augustinian theme. **(3 cr)**

CHS 1001 Modern Thought: Enlightenment to the

CRIMINAL JUSTICE PROGRAM

Director: TBA

Office: 2nd Floor, Geraghty Hall, tel. 519-4786

MINOR: Fifteen hours, including SOC 3000 and twelve hours chosen from the following: CJ 2300, 3000; SOC 2200, 3010, 3020, 3100, 3200, PHI 2140; PSC 3500, 3600

CERTIFICATE PROGRAM: Thirty credit hours including SOC 1000, 2200, 3000, 3010, and 3020. The remaining fifteen credits are electives. *NOTE: All course work in the Certificate Program is applicable to the Associate in Arts and the B.A. degrees. Required courses for the Certificate that also are required core courses in the Criminal Justice concentration may be applied toward the concentration in Criminal Justice. Students seeking the Certificate must apply at the Office of the Program Director.*

CERTIFICATE IN PRIVATE SECURITY: Thirty credit hours, including (a) CJ 1000 and 2300; (b) three courses chosen from CJ 2000, 2500, 3000, 3500, 3800, 4000, 4500; SOC 3010, 3020, and (c) fifteen credits of electives. *Note: All course work in the certificate program is applicable to a concentration in Private Security in conjunction with the Associate of Arts and the B.A. degrees. Students seeking the Certificate in Private Security must apply at the Office of the Program Director.*

CJ 1000 Introduction to Private Security Policies and procedures for special threats, institutional security systems, security issues, security challenges and the professionalization of private security. (3 cr)

CJ 2000 Institutional Security Policies, procedures and practices for the security of health, hotel, campus, museum, library and archival, cargo, bank, commercial, corporate, and retail operations. (3 cr)

CJ 2300 Law and Civil Liability The legal rights and civil liability of police officers, security officers, corporations, partnerships, individually owned businesses, and political jurisdictions in the protection of people and property from criminal and deviant activities. (3 cr)

CJ 2500 Private Security Investigation Investigation and the investigative strategies of organizations in conjunction with legal responsibilities and controls. (3 cr)

CJ 3000 Introduction to Victimology

Victim-offender relationships and the related concepts of victim vulnerability and victim culpability. (3 cr)

CJ 3500 Loss Prevention in Private Security Concepts and strategies associated with the prevention of waste, accident, error, crime and unethical practices. (3 cr)

CJ 3800 Private Security and Collective Behavior Protection for and the orderly control of people participating in mass audiences and demonstrations and the prevention and control of riots and mob behavior. (3 cr)

CJ 4000 Practicum in Private Security A supervised field experience in institutional and organizational security. (3 cr)

CJ 4500 Private Security Supervision and Management The supervision of private security personnel and the management of private security organizations. (3 cr) *Prerequisite: CJ 1000, 2300.*

ECONOMICS

Chair and Professor: Mathis

Professors: DeFina, Thanawala, Zech

Associate Professors: Donziger, Clain,
Farrell, Giordano, Kroch, Wolnicki, Zaleski

Assistant Professors: Alexandrin, C. Asher, Casario, Mao,
Matthews, Taylor, Walsh, Webster

Office: 342 Bartley, tel. 519-4370

BACHELOR OF ARTS IN ECONOMICS: Students in the College of Liberal Arts and Sciences who specialize in Economics earn the degree of Bachelor of Arts in Economics. Such students must take MAT 1330 (calculus) either to satisfy their math requirement or as a free elective. They should take ECO 1001 and ECO 1002 as two of the three social science courses in the Sophomore year. In the Sophomore or Junior year majors are required to take MGT 1006. In addition, students must successfully complete: ECO 2101, 2102; STA 2107, 2108; and 15 elective Economics credits.

MINOR: Students must take MAT 1330 (calculus), and complete a total of 18 credits consisting of ECO 1001, 1002, 2101, 2102, and 6 economics elective credits, excluding ECO 2110.

For a list of economics courses, please see the Economics listing in the College of Commerce and Finance section of this catalog.

EDUCATION AND HUMAN SERVICES

Chair and Assistant Professor: Nichols

Professors: Brooks, Heitzmann, Morgan, Weinrach

Associate Professor: Davis, Durnin

Assistant Professors: Flood, Hill, Kahn, Lafferty, Monnig, Murray, Ramirez, Rosa

Office: 302 St. Augustine Center, tel. 519-4620

The Department of Education and Human Services secondary teacher education program seeks to develop prospective teachers able to meet the demands of teaching in a variety of school environments, public and private, urban and suburban. Provisions for professional competencies and teacher certification include a thorough grounding in the liberal arts, a substantial concentration in an area of specialization and a study of the foundations, principles and methods of education. *NOTE:* Courses marked with an * are for education majors and students from other departments who have been accepted into the Teacher Education Program.

MAJOR: Secondary Education majors are required to earn a total of 37 credit hours in Education courses. These 37 hours include a Senior Seminar and a 12 credit Student Teaching experience which is open only to students of the senior year who have completed all the subject matter courses in the field of specialization.

MINOR: A minor in Education requires at least 16 credits. Distribution requirements are: EDU 2202, 3251, 3254, 4290. An additional three credits must be earned from among the following: EDU 2201, 3263, 4220, 4245, 4301. Education majors and minors must come to the Department each semester for advising.

EDU 2201 Social Foundations of Education I Major movements in the history of education to 1600 with emphasis on their social and philosophical context; historical development of educational aims, curriculum and types of education; religious and political influences on education. **(3 cr)** *Sem 1&2.*

EDU 2202 Social Foundations of Education II Development of public and private education in America in its social and philosophical context; types of education, governmental activity in education, educational finance, religious and political influences, impact of European developments. **(3 cr)** *Sem 1&2.*

EDU 3251 Psychology of Learning The application of learning theory to classroom teaching. **(3 cr)**

EDU 3254 Principles and Techniques of

Instruction The school curriculum; principles for selecting and using instructional materials; principles of educational measurement and evaluation; practical exercises in the use of media and materials, and in educational measurement; classroom management. **(4 cr)** *Sem 1&2.*

EDU 3263 Teaching the Exceptional Child Introduction to the physical and social characteristics of disabled and handicapped persons between ages 3 and 21. Issues of inclusion and mainstreaming in light of recent legislation and court decisions. Problem cases, with an emphasis on the underprivileged, antisocial, and delinquent. **(3 cr)** *Sem 2.*

EDU 4220 Specialized Methods in the Secondary School Approaches to teaching and their degrees of effectiveness; classroom management; methods

applicable to the teaching of all subjects; student preparation and presentation of material for his/her own subject-matter field.* **(3 cr)** *Prereqs: EDU 2201, 2202, 3251, 3254, enrollment in a certification program.*

EDU 4245 Reading and Current Issues in Secondary Education Techniques for evaluation of reading skills; methods of teaching reading in the subject areas; strategies for basic skill development; current issues in secondary education, and student observation in the schools. **(3 cr)**

EDU 4281 Methods and Materials of Teaching English/Communication in Secondary Schools The curriculum, planning units and lessons in the teaching area; general methods of teaching, special methods and instructional materials in the subject, including textbooks, courses of study and reference works; application of the principles and techniques studied in Education 3254 to teaching the subject; lesson plans, units and tests in using methods, techniques, and materials in the subject; planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers, and teach pupils in the subject.* **(3 cr)** *Sem 1. Prereqs: EDU 2201, 2202, 3251, 3254. Enrollment in the English or communication certification program.*

EDU 4282 Methods of Teaching Foreign Language in Secondary Schools The curriculum, planning units and lessons in the teaching area; general methods of teaching, special methods, and instructional materials in the subject, including textbooks, courses of study and reference works; application of the principles and techniques studied in Education 3254 to teaching the subject; lesson plans, units and tests and in using methods, techniques, and materials in the subject; planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers and teach pupils in the subject.* **(3 cr)** *Sem 1. Prereqs: EDU 2201, 2202, 3251, 3254. Enrollment in a foreign language certification program.*

EDU 4283 Methods and Materials of Teaching Mathematics in Secondary Schools The curriculum, planning units, and lessons in the teaching area; general methods of teaching special methods, and instructional materials in the subject;

including textbooks, courses of study and reference works; application of the principles and techniques studied in Education 3254 to teaching the subject; lesson plans, units and tests and in using methods, techniques, and materials in the subject; planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers and teach pupils in the subject.* **(3 cr)** *Sem 1. Prereqs: EDU 2201, 2202, 3251, 3254. Enrollment in the mathematics certification program.*

EDU 4284 Methods and Materials of Teaching Science in Secondary Schools The curriculum, planning units, and lessons in the teaching area; general methods of teaching special methods and instructional materials in the subject; including textbooks, courses of study and reference works; application to the principles and techniques studied in Education 3254 to teaching the subject; lesson plans, units and tests and in using methods, techniques, and materials in the subject, planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers and teach pupils in the subject.* **(3 cr)** *Prereqs: EDU2201, 2202, 3251, 3254. Enrollment in a science certification program.*

EDU 4285 Methods of Teaching Social Studies in Secondary Schools The curriculum, planning units, and lessons in the teaching area; general methods of teaching, special methods, and instructional materials, in the subject, including textbooks, courses of study and reference works, application of the principles and techniques studied in Education 3254 to teaching the subject, practice in preparing lesson plans, units and tests and in using methods, techniques, and materials in the subject; planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers and teach pupils in the subject.* **(3 cr)** *Prereqs: EDU 2201, 2202, 3251, 3254. Enrollment in the social studies program.*

EDU 4290 Philosophy of Education The development of a sound personal philosophy of education and practice in applying that philosophy to current educational issues. **(3 cr)** *Sem 1&2. Elective for all Seniors; one semester*

EDU 4291 Student Teaching Observation and

teaching under actual classroom conditions in the student's field of teaching specialization; open only to students of the Senior year who have completed all the subject matter courses in the field of specialization. * **(12 cr)** *Sem 1&2. Prereqs: Approval of the Director of Student Teaching, EDU 2201, 2202, 3251, 3254, and one of the following: EDU 4281, 4282, 4283, 4284, 4285; Coreq, EDU 4292.*

EDU 4292 Senior Seminar The student teaching experience; elements of school law; current educational issues; use of computers in the classroom; relationship of practice to theory; sharing of experiences, common problems and alternative teaching practices; open to student

teachers. * **(3 cr)** *Sem 1&2. Prereqs: approval of the department Chairperson, EDU 2201, 2202, 3251, 3254, and one of the following: EDU 4281, 4282, 4283, 4284, 4285; coreq, EDU 4291; one semester.*

EDU 4301 Humanistic Education Principles of humanistic psychology as they apply to education: Active listening, kinesics, values clarification, motivation, classroom groups, and the teacher as a group facilitator. **(3 cr)** *Sem 1. Prereq: education majors and students in other departments who have been accepted into the Teacher Education Program*

HUMAN SERVICES PROGRAM

The Human Services program is designed for students who desire a degree in liberal arts while pursuing a course of study which includes an experiential component as well as training for a specific career. Specialization within the program will allow the student to concentrate on specific areas related to government and human service agencies.

MAJOR: The requirements for a major in Human Services include the courses listed below in addition to Psychology 1000, 2200, 2500, 2600, and elective; Sociology 1000, 2000, 2200, 3600, 2300, which lead to a minor in Psychology and Sociology, respectively.

MINOR: A minor in Human Services requires a total of 15 credits. Distribution requirements are: H S 2000, H S 2100, H S 3000, H S 3100. An additional three credits must be earned from one of the following: H S 3500 or H S 3600.

H S 2000 Introduction: Principles and Survey of Practice The role of the human services worker as helper and interviewer in different agency settings. Designed to increase the student's awareness of his or her needs, impact on other persons, and the demands of the environment. **(3 cr)** *Sem 1.*

H S 2100 Assessment and Referrals Content and process of doing an individual assessment; the referral process. **(3 cr)** *Sem 2.*

H S 3000 Laboratory in Communication Skills The basic skills needed to function in a helping relationship. Role playing, audio or video taping and counseling in a controlled setting. **(3 cr)** *Sem 1.*

H S 3100 Laboratory in Group Dynamics The human services worker needs interaction in a group setting; and theories and techniques of group counseling. A group counseling experience will be a

part of the course. **(3 cr)** *Sem 2.*

H S 3500 Gerontology The aged and the aging process from a psychological and sociological perspective; recent trends and services; attitudes and behaviors typically seen in this population. **(3 cr)** *Sem 1.*

H S 3600 Life Skills Planning Determination of personal and professional life goals from the perspective of one's own strengths and weaknesses. Helping others in the process of selecting career paths and developing self and peer helping skills. Recommended for undergraduate students interested in the decision-making factors in career selections. **(3 cr)** *Sem 1&2.*

H S 3700 Human Service Systems Organizational structures, trends, and influences that impact Human

Services Systems. Special emphasis upon managed care and case management as well as Human Resource Development. **(3 cr)** *Sem 1.*

H S 4000 Seminar in Human Services Integration of the theoretical and practical aspects of the student's program. **(3 cr)** *Sem 2. Prereqs: H S 2000, 2100, 3000, 3100.*

H S 4100 Practicum in Human Services

Application of human service skills gained in the program through volunteer service in a community organization and structured peer counseling. The on-campus seminar will focus on tapes and case study material. **(6 cr)** *Sem 2. Prereqs: senior standing, H S 4000. Majors only.*

ENGLISH

Chair and Professor: Cherry

Professors: Delano, McDiarmid, Murphy, Nolan, Pulsiano, Sherry, Thomas, Wilkinson

Associate Professors: Berthold, Hagen, Kinney,

Kirschke, Murphy, Ormsby-Lennon, Radcliffe, Schwarz

Assistant Professors: Bader, Blimm, Hicks, Hollis, Irwin,

Lytel-Murphy, Sewell, Shohet, Wood

Instructors: Bonds, Lucky

Office: 402 St. Augustine Center, tel. 519-4630

MAJOR: Thirty-three hours in advanced English courses (numbered 2000 or above) in the junior and senior years, including:

- ? Two courses in British literature pre-1800 from two of three areas: (1) Medieval; (2) Renaissance (to 1649); (3) Restoration and Eighteenth Century.
- ? One course in American literature to 1900 or one course in nineteenth-century British literature.
- ? One course in American literature or British/Irish literature after 1900.
- ? Senior Seminar
- ? Six electives

A student who takes a course in nineteenth-century British literature must complete a course in American literature after 1900; conversely, a student who takes a course in American literature up to 1900 must complete a course in British/Irish literature after 1900. A student who takes a course in American literature after 1900 must complete a course in nineteenth-century British literature; conversely, a student who takes a course in British/Irish literature after 1900 will be required to complete a course in American literature to 1900.

British Literary Tradition 1 and 2 (2101, 2102) and *American Literary Tradition 1 and 2* (2103, 2104) are not required for the major, but can operate as free electives, with a maximum of two permitted toward the major (including any survey course taken as a Core literature requirement as well as ENG 2400, 2401, etc.).

MINOR: Fifteen hours including:

- ? At least one course from the British literature offerings (3000 level courses).
- ? At least one course from the American literature offerings (4000 level courses)
- ? At least three electives from the English departmental offerings (2000 to 4999)

ENGLISH AS A SECOND LANGUAGE: English 0990 (ESL 1), and English 0095 (ESL 2). For those foreign students who need to strengthen their oral and verbal skills in English, The ESLP provides two courses ENG 0990 and ENG 0095, the courses will concentrate on improving students' basic grammar, as well as their pronunciation, conversation, reading comprehension, and writing skills.

ENG 0990 English as a Second Language I
Specialized instruction for students in the fundamentals of English. (3 cr)

ENG 0995 English as a Second Language II A continuation of English 0990. (3 cr)

ENG 1010 Composition In this Writing Intensive course, students concentrate on the writing process to produce expository prose that demonstrates analytical thinking skills and the ability to use direct and concise language for effective communication. (3 cr)

ENG 1050 The Literary Experience An introduction to literature and the methods of literary analysis founded upon close readings of texts from a variety of perspectives and including works from a range of genres and periods. The course is designed to instill within the student a sense of critical confidence through approaches of increasing complexity, from a mastery of the text to an understanding of the broader historical and philosophical forces in the literary work; the course thus addresses the interdisciplinary awarenesses central to the new Core. Individual courses may vary in the works chosen; all courses are writing intensive. **(3 cr)**

ENG 2000 Advanced Expository Writing Practice in writing reports, reviews, arguments, description; emphasis on organization and development. *Limited to 15 students. Permission of instructor required.* **(3 cr)**

ENG 2005 The Writing of the Short Story Instruction in writing short story. *Limited to 15 students. Permission of instructor required.* **(3 cr)** Sem 1&2.

ENG 2006 The Writing of Poetry Instruction in writing poetry. *Limited to 15 students. Permission of instructor required.* **(3 cr)**

ENG 2007 The Writing of Screenplays Instruction in writing screenplays. *Limited to 15 students. Permission of instructor.* **(3 cr)**

ENG 2008 The Writing of Plays Instruction in writing plays. *Limited to 15 students. Permission of instructor required.* **(3 cr)**

ENG 2010 Technical Writing The writing of formal reports and proposals and descriptions of mechanisms and processes. **(3 cr)**

ENG 2020 Interpretive Journalism News gathering and news writing; principles, rules and techniques of news, editorials, features. A practicum with lectures. Use of computers and word processing. **(3 cr)** *Limited to 20 students. Permission of instructor required*

ENG 2021 The Press and Society, The Print Media in a Democracy The functions of the media; examination of newspapers and organization; investigative journalism, in-depth reporting; analysis of news and ethics in reporting; canons of journalism. Practicum with lectures. Assignments outside of class. **(3 cr)** *Prereq: ENG 2020.*

ENG 2030 Tutoring Writers Theory and practice of Writing Center Work; writing, editing and tutoring skills. **(3 cr)**

ENG 2040 Literacy and Society The social implications of reading and writing. **(3 cr)**

ENG 2101 British Literary Tradition 1 A study of the growth of British literature from the Anglo-Saxon to the Neo-Classical periods. **(3 cr)**

ENG 2102 British Literary Tradition 2 A study of British literature from the genesis of Romanticism in the 19th century to the literature of modern times. **(3 cr)**

ENG 2103 American Literary Tradition 1 The development of American literature from the Colonial Period to the era of Walt Whitman and other writers whose lives and works largely precede the Civil War. **(3 cr)**

ENG 2104 American Literary Tradition 2 The development of American literature from the Civil War to modern times. **(3 cr)**

ENG 2200 The History of the English Language The development of the English language from Old English to Modern English. **(3 cr)**

ENG 2250 Introduction to Literary Criticism Principles of the study of literature; its intellectual and historic principles, technical terms and cultural implications. **(3 cr)**

ENG 2300 Women in Literature Study of the place of women in literature, with emphasis on modern fiction, drama and poetry written in English. **(3 cr)**

ENG 2301 The Literature of Science Fiction Science fiction as a significant genre. **(3 cr)**

ENG 2310 The Study of Poetry Concepts of poetry

with detailed analyses of selected poems. (3 cr)

ENG 2320 The Forms of the Novel The nature of the novel as an art form in British, American, and European works. (3 cr)

ENG 2330 The Forms of the Drama Introduction to the main types of European and American drama. (3 cr)

ENG 2340 The Modern Short Story Contributions to the short story form made by American, Irish, British, and Continental writers. (3 cr)

ENG 2400 Western World Literature 1 Readings in translation of some of the classics written by Homer, Aeschylus, Sophocles, Euripides, Aristophanes, Aristotle, Dante, Moliere, Corneille, Goethe, Turgenyev, Dostoevski, and Chekhov. (3 cr)

ENG 2401 Western World Literature 2 Readings, chiefly in translation, of some of the classics of Western literature from the Enlightenment to today, by such writers as Moliere, Voltaire, Goethe, Flaubert, Tolstoy, Ibsen, Brecht, Kafka, and Pirandello. (3 cr)

ENG 2450 Irish Literature to 1800 A study of Irish literature from its origins in the world of Celtic mythology, epic and saga through the development of Anglo-Irish literature. (3 cr)

ENG 2500 The Irish Renaissance Selected readings in the drama and fiction literature of Ireland in the 20th century. (3 cr)

ENG 2505 African-American Literature: Poetry The poetry of Wheatley, Harper, Dunbar, Johnson, Hughes, Brooks, Sanchez, Giovanni, Angelou, Harper, Dove, and other writers of the 18th, 19th, and 20th centuries. (3 cr)

ENG 2510 African-American Literature: Novel Novels published during Reconstruction, the Harlem Renaissance, the Black Arts Movement, and throughout the 20th century. (3 cr)

ENG 2515 African-American Literature: Drama Major Works of the Harlem Renaissance, the Black Arts Movement, and the present. (3 cr)

ENG 2520 African-American Literature: Short Story Short fiction by Chesnutt, Hurston, Petry, Baldwin, McPherson, Williams, Walker, Morrison, Butler, and other writers of the 20th century. (3 cr)

ENG 2610 Tutorial Readings Program of approved readings under the supervision of a selected faculty member; examination on readings and a lengthy paper required. Restricted to senior English majors with high cumulative averages. Permission of chair required; ordinarily may not be repeated. (3 cr)

ENG 2620 Seminar: Individual Authors or Topics Individual authors or topics chosen by the instructor. *Limited to 20 students.* (3 cr)

ENG 2700 Studies in Literature Specific topics vary each semester. *Limited to 20 students.* (3 cr)

ENG 2993 Internship (3 cr) *Prereq: ENG-2020.*

ENG 2996 (6 cr) *Prereq: ENG-2020.*

ENG 3000 Introduction to Old English Language and Literature Old English literary works in translation and original language. (3 cr)

ENG 3100 Anglo-Saxon Literary Culture Material and cultural artifacts of the period ca. 450-1066 within historical, art-historical, archaeological, and literary contents (works in Translation). (3 cr)

ENG 3101 Early British Literature in Translation Literature of England, Ireland, and Scotland from the beginnings through the 15th century. (3 cr)

ENG 3150 Chaucer *The Canterbury Tales, Troilus and Criseyde*, and additional works. (3 cr)

ENG 3200 Seminar: Studies in Medieval Literature Topics vary each semester. Consult departmental bulletin. (3 cr)

ENG 3201 The English Renaissance Non-dramatic literature of the English Renaissance. (3 cr)

ENG 3230 Elizabethan and Jacobean Drama Playwrights of the English Renaissance excluding Shakespeare. (3 cr)

ENG 3250 Shakespeare A selection of plays by Shakespeare. (3 cr)

ENG 3300 Seventeenth-Century Poetry and Prose

The poetry of Donne, Jonson, Lanyer, Herrick, Herbert; essays, sermons, journals, letters, pamphlets of Bacon, Donne, Milton, and others. (3 cr)

ENG 3350 Milton English poems and selected prose on issues of gender, politics, religion, culture. (3 cr)

ENG 3420 Eighteenth-Century British Novel

Writings by Defoe, Fielding, Sterne, and others; and the Gothic novel of terror. (3 cr)

ENG 3430 Restoration and Eighteenth-Century Drama Dramatists from Dryden to Sheridan. (3 cr)

ENG 3450 Dryden, Swift, and Pope The study of the principal works of the major Neo-Classical writers. (3 cr)

ENG 3501 Early Romantic Writers Wordsworth, Coleridge and other writers of the first half of the Romantic period. (3 cr)

ENG 3502 Later Romantic Writers Byron, Shelley, Keats and other writers of the second half of the Romantic period. (3 cr)

ENG 3505 Nineteenth-Century Poetry and Prose, 1830-1865 The poetry and prose of Carlyle, Tennyson, Browning, Newman, Arnold, and other writers of the era. (3 cr)

ENG 3506 Nineteenth-Century Poetry and Prose, 1865-1900 The poetry and prose of Ruskin, Rossetti, Swinburne, Hopkins, Pater, Hardy, and others. (3 cr)

ENG 3520 The Nineteenth-Century British Novel Selected novelists from Jane Austen to Thomas Hardy. (3 cr)

ENG 3525 Dickens Selected novels by Charles Dickens. (3 cr)

ENG 3610 Modern British Poetry British poetry

from 1900 to the present, with emphasis on Hopkins, Hardy, Yeats, Eliot, Auden, Muir, Edith Sitwell, Dylan Thomas, and Philip Larkin. (3 cr)

ENG 3615 James Joyce A study of the novels and short stories of James Joyce, with concentration on *Ulysses*. (3 cr)

ENG 3616 Irish American Drama and Film

Depictions of the American Irish in popular dramas and films from colonial times to the present. Popular Irish-American actors and their appeal, the Irish-American musical stage tradition, and the cross-over from popular drama to popular films such as John Ford's *The Quiet Man* and *The Informer*. (3 cr)

ENG 3620 The Modern British Novel The British novel from the turn of the century to World War II. (3 cr)

ENG 3621 The Contemporary British Novel The development of the novel since World War II. (3 cr)

ENG 3630 Modern British Drama British drama from the 1890s to the Theatre of the Absurd. (3 cr)

ENG 4001 Major American Writers I The masterpieces of selected American writers from early times to the Civil War era. (3 cr)

ENG 4002 Major American Writers II Masterpieces of the chief American writers since the Civil War. (3 cr)

ENG 4040 The American Short Story Development of the short story in America from Washington Irving to the present. (3 cr)

ENG 4500 American Slave Narrative Slavery as a central paradox of American history and literature with emphasis on race and gender. Readings by Douglass, Brent, Stowe, Morrison, and others. Previous course work in American literature is recommended. (3 cr)

ENG 4501 New England Transcendentalism An intensive analysis of Emerson, Thoreau, and other Transcendentalists. (3 cr)

ENG 4510 Nineteenth-Century American Poetry

American poetry from its beginning to Emily Dickinson. (3 cr)

ENG 4520 The American Novel to 1895

The genesis of the American novel. (3 cr)

ENG 4530 The American Renaissance

Pre Civil War texts, primarily from 1850-1855. (3 cr)

ENG 4605 American Poetry: 1900-1950

American poets of the first half of the twentieth Century, including Robinson, Frost, Stevens, Cummings, Williams, Millay, Pound, Eliot, and others. (3 cr)

ENG 4615 American Poetry Since 1950

American poets since 1950, including Lowell, Plath, Sexton, Snodgrass, Ginsberg, Rich, Snyder, Baraka, and others. (3 cr)

ENG 4619 The Works of Edith Wharton

Socio-sexual tensions in the world of Edith Wharton. The external world she knew: upper class New York society, its totems and taboos, tribal aspects, and sexual tension; and the internal world of Wharton herself with its repressive sexuality and psychological complexities. (3 cr)

ENG 4620 The American Novel: 1895-1950

Representative novelists from Crane to Steinbeck. (3 cr)

ENG 4621 The American Novel Since 1950

Novels of the late Modern Period and of the early Post-modern period. (3 cr)

ENG 4630 Twentieth-Century American Drama

Major plays of the period. (3 cr)

ENG 4640 Contemporary American Women's

Literature Writings by women from WW II to the present. Works by Ann Petry, Maxine Hong Kingston, Toni Morrison, Joyce Carol Oates, Kathy Acker, Bobby Ann Mason, and others. (3 cr)

ENG 4645 Postmodern American Fiction

Experimental narratives by American writers of the last four decades. Works by Vladimir Nabokov, Thomas Pynchon, Ishmael Reed, Don DeLillo, Joanna Russ, and others. (3 cr)

ENG 5000 Senior Seminar

Capstone experience combining immersion in primary and secondary materials with an intensive writing experience. Limit of 15 students. (3 cr)

COLLEGE ETHICS

Director: Wall

Office: 105 St. Augustine Center, tel. 519-4600

The College of Liberal Arts and Sciences believes that issues of ethics and values are at the heart of every human endeavor. In addition to regular requirements in the sciences and humanities, the College also requires each Arts and Sciences student to take a special multidisciplinary course in ethics, typically in the sophomore year. The purpose of this course is to give students the opportunity to examine and discuss both ethical theories and their applications to contemporary moral issues. This course is designed to contribute to the implementation of Villanova's mission statement which states that, as a Catholic institution Villanova both emphasizes the values of the Jewish and Christian humanistic traditions and concerns itself with all value systems.

The sections of this course are deliberately held with smaller class sizes, to give students a greater opportunity to debate and discuss the issues.

ETH 2050 Ethics Major Western ethical traditions as they apply to selected contemporary ethical problems, with special consideration of Jewish and Christian perspectives. This course satisfies the Arts and Sciences Writing Enriched requirement. (3 cr)

GENERAL ARTS PROGRAM

Director and Professor: Schrems
Office: 451 St. Augustine Center, tel. 519-4661

MAJOR: The General Arts major is an interdisciplinary major within the College of Liberal Arts and Sciences. Students in the program select a General Arts concentration in one of the following areas: (1) Humanities, (2) Social Sciences, or (3) Independent Studies. Within the selected concentration the student plans a course of study which cuts across normal academic lines.

GENERAL REQUIREMENTS: A minimum of eight advanced courses must be chosen for the General Arts major. Courses which may not be used for the major in General Arts include all courses numbered from 1000 to 1999 (except AAH) as well as certain specific courses numbered 2000 and above found listed in the Enchiridion or at the Office of Special Programs. The General Arts degree may not be part of a double major.

The normal fourth Core Writing Intensive course is satisfied with the General Arts Seminar (GEN 5001). Under special circumstances outlined by the Director and upon written request a student may substitute a research project (GEN 6001) for the seminar.

The Elementary Education certification program is coordinated through the General Arts office. Incorporated into General Arts major may be such specialized concentrations as Africana Studies, Arab and Islamic Studies, Criminal Justice, Irish Studies, Latin American Studies, Russian Area Studies, Peace and Justice, and Women's Studies. Other concentrations of the student's own making are possible, and are common pursued within the major.

CONCENTRATIONS:

1. *The Humanities Concentration:* (1) seven non-excluded upper level electives beyond the core requirements from within the following disciplines: Art History, Classical Studies, Communication, Education, English, French, German, History, Peace and Justice, Philosophy, Religious Studies, Spanish, Theatre, and appropriate Honors courses; (2) the General Arts Seminar (GEN 5001).

2. *The Social Sciences Concentration:* (1) seven non-excluded upper level electives beyond the core requirements from within the following disciplines: Criminal Justice, Economics, Geography, Political Science, Psychology, Sociology, and appropriate Honors courses; (2) the General Arts Seminar (GEN 5001).

3. *Independent Studies Concentration:* (1) seven non-excluded upper level electives beyond the core requirements from within a combination of the humanities and social sciences. This affords the student freedom to define an intellectually challenging and coherent program. Students interested in this concentration submit to the Director of General Arts an essay describing the goals and proposed program of study. With the approval of the Director and in cooperation with the student, a faculty mentor will be assigned. (2) Unless waived in lieu of a special seminar or research project (GEN 6001) the student must also take the General Arts Seminar.

GEN 1903 Internship Elective Permission of Program Director. Junior or seniors with a 3.0 overall QPA only. **(3 cr)** *Sem 1&2.*

GEN 1906 Internship Elective Permission of Program Director. Juniors and seniors with 3.0 overall QPA only. **(6 cr)** *Sem 1&2.*

GEN 1909 Internship Elective Permission of Program Director. Juniors and seniors with a 3.0

overall QPA only. **(9 cr)** *Sem 1&2.*

GEN 2993 Internship Credits may be applied to requirements for the major in General Arts in the required General Arts elective slots. Permission of Program Director. Juniors and seniors with an overall QPA of 3.0 only. **(3 cr)** *Sem 1&2.*

GEN 2996 Internship Credits may be applied to requirements for the major in General Arts in the

required General Arts elective slots. Permission of Program Director. Juniors and seniors with an overall QPA of 3.0 only. **(6 cr)** *Sem 1&2.*

GEN 5001 General Arts Seminar

Integrative seminar dealing with the relation of the social sciences and the humanities. May be viewed as similar to a “Core Seminar III” combining ancient, modern, and contemporary thought. **(3 cr)** *Sem 1.*

GEN 6001 Research Individual students with specific interdisciplinary study projects will work with a particular professor on a tutorial basis. Students must have senior status. The final research paper must be approved by the professor and the director. **(3 cr)** *Sem 1.*

GEOGRAPHY

Chair and Associate Professor: Leaman

Assistant Professors: Hu

Office: 304 St. Augustine Center, tel. 519-4640

The geography major focuses on the interaction of human and physical environments within a spatial context. Individual programs are formed around major geographic problems and world regions. The department offers course work in four areas (1) human systems analysis; (2) geographical techniques; (3) regional analysis; and (4) environmental analysis. Students are encouraged to explore closely related academic fields and interests.

MAJOR: At least 24 credits in geography. The distribution of these credits is: GEO 1000 introductory courses (6 credits); GEO 3000 regional courses (3 credits); GEO 4000 techniques courses (3 credits); GEO 6000 seminar and independent study courses (3 credits); and 9 credits for any combination remaining of the 1000, 2000, 3000, 4000, 5000, and 6000 series courses.

Majors and Minors who meet certain academic standards are eligible for membership in The Eta Lambda chapter of Gamma Theta Upsilon, the International Geography Honors Society, which annually sponsors activities, lectures and field trips.. Internships designed for geography majors are also available.

MINOR: Requirements are: GEO 1000 introductory courses (3 credits); GEO 3000 regional courses (3 credits); and 9 credits from any combination of the 1000, 2000, 3000, 4000, 5000, and 6000 series courses.

INTRODUCTORY COURSES

GEO 1001 International Approaches to Geography

The human and physical realms of Geography. Focus on current geographic problems facing specific regions of the world. **(3 cr)** *Sem 1&2.*

GEO 1500 Physical Geography World climates, water, landforms, soil, and vegetation form the basis of this global environmental approach. **(3 cr)** *Sem 1&2.*

GEO 1700 Cartography From the concept of mental mapping to computer cartography, integrated with a series of hands-on map-making experiences. **(3 cr)** *Sem 1&2.*

HUMAN SYSTEM ANALYSIS

GEO 2000 Political Geography Spatial attributes of political process and structure, with an emphasis on current geo-political issues in the world. **(3 cr)**

GEO 2100 Economic Geography Locational analysis of the major agricultural, manufacturing, and service industries in an increasing interdependent world. **(3 cr)** *Sem 1&2.*

GEO 2200 Urban Geography The location, structure, functions and growth problems of cities; possible solutions for preserving or restoring a livable urban environment. **(3 cr)** *Sem 1&2.*

GEO 2300 Population Geography Spatial patterns

of human population; population size, growth, and characteristics; vital statistics, projection and forecasting techniques, the relationship of population to environmental problems. **(3 cr)** *Sem 2.*

REGIONAL ANALYSIS

GEO 3500 North America The physical and cultural environments of the United States and Canada. **(3 cr)** *Sem 1.*

GEO 3600 Europe The strengths and weaknesses and the human and natural resources of Europe and the Common Market. **(3 cr)**

GEO 3700 Africa Major geographic problems facing contemporary Africa, with a special emphasis on spatial planning within a number of national contexts. **(3 cr)** *Sem 1&2.*

GEO 3800 Geography of the Islamic World The physical environments and life patterns of the Islamic peoples in Asia and Africa. The historical and contemporary interrelationship between the Islamic World and the West. **(3 cr)**

GEOGRAPHICAL TECHNIQUES

GEO 4050 Air Photo Interpretation

Basic skills necessary to identify a variety of phenomena on aerial photographs employing a number of film types. **(3 cr)** *Sem 1&2.*

GEO 4101 Geographic Information Systems

Principles and applications of Geographic Information Systems (GIS), with an emphasis on vector data structures and relational data base management systems. Pc-based GIS provides experience with methods to store, retrieve, manipulate and manage spatial and associated attribute information in solving geographic problems. **(3 cr)** *Sem 1&2.*

GEO 4250 Remote Sensing The technology used to produce reliable interpretive data about objects and environmental phenomena by recording, analyzing, and interpreting wave/force fields and patterns of transmitted, reflected, and emitted energy. New developments in imaging techniques, particularly those related to satellite, thermal infrared and radar sensor systems. **(3 cr)** *Sem 2.*

GEO 4300 Advanced Cartography The study and practical experience map production from conception to color proofing. Students design and execute maps of publishable quality. **(3 cr)** *Prereq: GEO 1700*

ENVIRONMENTAL ANALYSIS

GEO 5100 Resource Management and

Conservation Problems and policies arising from the use and misuse of the environment; assessment of the consequences of applying various policies, and the development of an environmental/resource ethic. **(3 cr)**

GEO 5200 Geography of Land-Use Management

Land-use decisions and policies: agricultural, recreational, nuclear, urban, and industrial environments. **(3 cr)** *Sem 1.*

GEO 5300 Disasters: Natural Hazards and Risk

Assessment Environmental hazards that threaten health and safety at national and global levels. Mechanics, distributions, risks, mitigation control and case histories for each major hazard: earthquakes, tsunamis, volcanoes, coastal erosion, avalanches, tornadoes, hurricanes, flooding, and subsidence. **(3 cr)** *Sem 2.*

SEMINARS AND

INDEPENDENT STUDY

GEO 6000 Geography Seminar Student research on the historical development of geographic thought. **(3 cr)** *Sem 1&2. Prereq: Permission of Instructor.*

GEO 6001 Seminar in Geographic Education

Readings on teaching and learning, historic and contemporary, with emphasis on geographic education. Students assist in some lower division courses and evaluate teaching philosophies and methodologies. Restricted to geography majors. **(3 cr)**

GEO 6100 Geography Seminar

Student research on trends in current geographic literature. **(3 cr)** *Prereq: Permission of Instructor.*

GEO 6200 Independent Study

Individual projects or studies in geography. **(3 cr)** *Sem 1&2. Prereq: Permission of Instructor.*

HISTORY

Chair and Associate Professor: Lindenmeyr

Professor: Bergquist

Associate Professors: Burke, Gallicchio, Haas, Johnson, Keita,
Kiley, Koven, McLaughlin, Schweitzer

Assistant Professors: Dorley, Ener, Little, Mires, Ryan, Sullivan, Winer

Office: 403 St. Augustine Center, tel. 519-4660

MAJOR: HIS 1050 plus 27 additional credits in history including: HIS 5501 or HIS 5515 (Independent Research); at least six credits in United States history--1000 and 1001 or 2000 level courses; at least six credits in European history (ancient, medieval, modern)--1020 and 1021 or 3000 level courses; and at least three credits in Latin American, Middle Eastern, African, or Asian history--4000 level courses. One of the European history courses must be in a period before 1750.

MINOR: At least 18 credit hours in history. For students in the College of Liberal Arts and Sciences, the 18 credit hours must include HIS 1050.

HIS 1000 The United States to 1877 American colonial beginnings, the Revolution, formation of the new nation, Jeffersonianism and Jacksonianism, expansion, the slavery crisis, the Civil War and Reconstruction. Fulfills Arts and Sciences core history requirement for Education majors only. **(3 cr)** *Sem 1.*

HIS 1001 The United States since 1877 The settlement of the West, industrialization, agrarian and labor unrest, Progressivism, the New Deal, the two world wars, the Cold War, recent domestic and international problems. Fulfills Arts and Sciences core history requirement for Education majors only. **(3 cr)** *Sem 2.*

HIS 1020 History of Western Civilization I Formation of Western Civilization from the Ancient World through the mid-seventeenth century. Emphasis on the interaction of the classical, Christian, and Germanic elements in the formation of medieval and early modern Europe. Does not fulfill Arts and Sciences core history requirements. **(3 cr)**

HIS 1021 History of Western Civilization II Evolution of the West in the world from the mid-seventeenth century to the present with attention to cultural and social themes as well as political and international developments. Does not fulfill Arts and Sciences core history requirements. **(3 cr)**

REQUIRED HISTORY SURVEY

HIS 1050 Themes in Modern World History

Major historical moments and themes in the political, economic, and cultural transformation of diverse nations and regions of the world during the past several centuries. A topical and interpretive approach designed to provide a historical and cross-cultural context while exploring the origins and implications of the changes that have come to characterize the "modern" world. **(3 cr)** *Sem 1&2.*

NORTH AMERICAN CIVILIZATION

HIS 2151 Colonial America The political, economic, social, and intellectual life of the American colonies and the clash of racial and ethnic groups in America to 1763. **(3 cr)** *Sem 2.*

HIS 2161 Revolutionary and Federalist America The forces that brought about the American Revolution; the successes and failures of the Confederation government; the domestic and foreign problems of the Federalist era to 1800. **(3 cr)** *Sem 1.*

HIS 2171 Early 19th Century America The development of the Republic from the presidency of Jefferson through the Mexican War; the struggle of nationalism and sectionalism; the impact upon American life of an emergent democratic spirit, the ferment of reform, and Manifest Destiny. **(3 cr)** *Sem 1.*

HIS 2181 American Civil War and Reconstruction

The "irrepressible conflict"; its causes, progress, and termination; the settlement of the Reconstruction; the historiographic controversies to which the era has given rise. (3 cr) *Sem 2.*

HIS 2191 America in the Gilded Age/Progressive Era, 1870-1920

Causes and results of industrialization and urbanization; responses to economic and social change, including popular protest movements and governmental regulation; rise of an urban culture of consumption. (3 cr)

HIS 2201 The United States and Two World Wars, 1914-1945

Major problems and domestic developments in the United States in World War I, the 1920s, the Great Depression and World War II. (3 cr) *Sem 1.*

HIS 2202 The United States since 1945

Major problems and domestic developments in the United States since 1945: reconversion, Cold War, the "Good Society" of the 1950s, turmoil of the 1960s, Vietnam War and its aftermath, contemporary challenges and problems. (3 cr) *Sem 2.*

HIS 2251 United States Foreign Relations 1776-1914

The completion of independence, hemispheric diplomacy, expansion, Civil War, and imperialism. (3cr) *Sem 1.*

HIS 2252 United States Foreign Relations 1914-Present

Diplomatic history from World War I to the present, including involvement in European and Asian struggles, cooperation in international organizations. (3 cr)

HIS 2261 The Frontier in the History of the United States

Westward expansion from the American Revolution to 1900; the influence of expansion upon society, culture, and politics. (3 cr) *Sem 2.*

HIS 2265 American Military History to 1900

The wars of America from their European antecedents to 1900; relations between the military and society; role of the military in national development. (3 cr) *Sem 2.*

HIS 2272 American Economic History to 1880

The American colonial economy; the economic

causes and consequences of the American Revolution and the movement for a national constitution; the transportation revolution; the first industrial revolution; the beginnings of wage labor and workingmen's organizations; the transition to sustained economic growth; the separate economic system of the South and slavery; and the economic consequences of the Civil War. (3 cr)

HIS 2273 American Economic History since 1880

The American economy since 1880; urbanization; immigration; the decline of farming; the labor movement; the beginnings of government regulation; the effect of World War I on the economy; the deceptive prosperity of the 1920s; the stock market crash of 1929 and the Great Depression; the New Deal; the economic effects of World War II; post-war recovery; the Great Society; economic effects of the Vietnam War; stagflation; the Reagan years; and the national deficit. (3 cr)

HIS 2281 Immigration and Minorities in American History

Population factors in the development of the American nation; the processes of migration, assimilation and intergroup relations and their effects in society and politics; intensive study of selected ethnic groups. (3 cr)

HIS 2286 Irish-American Saga

Pre-famine Irish emigration to North America; the famine; post-famine movement; Irish-American labor, politics, urban and suburban developments. (3 cr)

HIS 2291 African American History during Slavery

The forced migrations of Africans to the New World, the institution of slavery, and the struggle of Afro-Americans to gain equality in American society. (3 cr)

Sem 1.

HIS 2292 African American History since Slavery

Themes of resistance and creativity with the development of the African-American communities in the era following the Civil War as a central theme. Reconstruction, Northern migration, Jim Crow and segregation, and protest thought and civil rights. (3 cr) *Sem 2.*

HIS 2296 Changing Roles of Women in American Society

The variety of beliefs in America regarding

the differences between the sexes, and the behaviors appropriate to each, from the seventeenth century to the present; gender within the context of changing forms of production, methods of social organization, and ideas about human nature and society. (3 cr) *Sem 1 & 2.*

HIS 2306 The Culture of Industrializing America, 1820-1920 Cultural sources of American expansion and economic development; the effects of industrialization on patterns of life and thought and the responses of different groups to these changes. (3 cr)

HIS 2993 History Departmental Internship An internship in a local historical archive, museum, park, or library. (3 cr) *Sem 1 & 2.*

HIS 2996 History Departmental Internship A more extensive internship in a local historical archive, museum, park, or library. (6 cr)

HIS 2998 Topics in American History Selected topics in American history of interest to faculty and students. (3 cr)

GENERAL THEMES ON
EUROPE AND ITS RELATIONSHIP WITH THE
WORLD

HIS 3005 Individual and Community in the Ancient World, 3000 BC to AD 500 The formation of diverse Mediterranean societies and the emergence of the individual within those societies. Egypt, Mesopotamia, ancient Israel, and the broader Mediterranean cultures of Greece and Rome. (3 cr) *Sem 1.*

HIS 3006 Medieval Europe and its Neighbors, 500-1500 The evolution of the European West from its classical origins, the influence of Christianity upon the development of its institutions and culture, and relations and mutual influences of the European West with its neighbors, the new world of Islam in the Near East and North Africa, and the Christian Byzantine East of Europe and Russia. (3 cr) *Sem 2.*

HIS 3007 Early Modern Europe and Expansionism 1500-1750 The rise of Protestantism, the emergence of national monarchies, the growth of science and technology, colonial expansionism and

the impact of the New World on the West, the clash of cultures with Islam and other civilizations on the peripheries.

EUROPEAN CIVILIZATION

HIS 3011 Greek Civilization from the Bronze Age to Philip II The rise of Greek civilization from Mycenaean times to the Macedonian conquest of Greece by the father of Alexander the Great: Homer, the emergence of the polis, the Persian and Peloponnesian wars, and the flowering of Greek culture at Athens during the 5th and 4th centuries. (3 cr) *Sem 1.*

HIS 3014 The Mediterranean World from Alexander to Caesar The interaction of cultural forces between the conquests of Alexander the Great and the consolidation of Roman rule under Caesar: Hellenistic civilization, the rise of Rome in Italy, Rome and the Greek world, and the fall of the Roman Republic. (3 cr)

HIS 3017 The Roman Empire The achievement of the Pax Romana from the reforms of Augustus to the break-up of the western Empire in the fifth century A.D. Topics treated include life in the provinces, the romanization of indigenous peoples, the legions and society, culture and decadence in the capital, and the rise of Christianity. (3 cr) *Sem 2.*

HIS 3095 Topics in Ancient History Selected topics in Ancient history of interest to faculty and students. (3 cr)

HIS 3101 Early Medieval History Europe from the fall of Rome to the end of the Viking Age. (3 cr) *Sem 1.*

HIS 3108 The Crusades The medieval conflict between the rival cultures and religions of Christendom and Islam. (3 cr) *Sem 2.*

HIS 3115 The High Middle Ages The major western European institutions that took form during the classical period of medieval civilization and were bequeathed to modern European society. (3 cr)

HIS 3121 The Renaissance The decline of society in the Late Middle Ages and the emergence of commercial capitalism; the disintegration of the Holy

Roman Empire and the evolution of city-states and new monarchies in the fifteenth century; the crisis of the Papacy and the emergence of humanism; the Italian universities in the Late Middle Ages and the development of new tastes in literature, art, and architecture.

(3 cr) *Sem 1.*

HIS 3131 The Reformation Catholic, Protestant, and popular reform theories and religious upheaval, and the revolution of the common people in the 16th century, with emphasis on the material "structures of everyday life" and the economic, social, and political background of the "crisis of feudalism" and critique of the church and early modern state. **(3 cr)**

HIS 3151 European Powers and Nationalism, 1815 to 1914 Emergence of nationalism as force in European affairs; the nature of nationalism; Italy, Germany, France, Great Britain, and Eastern Europe. **(3 cr)** *Sem 1.*

HIS 3161 Western Europe Since World War I Western Europe from the outbreak of the First World War to the present. **(3 cr)**

HIS 3200 Medieval Britain and Ireland The debts England owes to the Celtic, particularly the Irish, world; changed relations, from fruitful cultural exchange to antagonism, after the Norman Conquest of England. Irish missionary and educational importance; relations between Celtic peoples; and the growth of monarchy in England and Scotland, but not in Wales and Ireland. **(3 cr)**

HIS 3202 Britain in the Age of Revolutions, 1600-1815 Emergence of Britain as preeminent global capitalist economy and political power from the glittering court of Charles II to Britain's loss of its American colonies and its victory over revolutionary France. Connections between political-economic developments and social and cultural change including industrialization; war, economic growth and state formation; smuggling, gin, and criminality; empire and the domesticity, women and the novel; high and low art in London.. **(3 cr)** *Sem 2.*

HIS 3203 Great Britain since 1815 British politics, society and culture from the triumph of Waterloo to youth culture in the post-industrial world of the

Beatles. Topics include Liberalism; industrial conflict, urban poverty and radical politics; Anglo-Irish relations; degeneration and fin-de-siecle sexual anarchy; rise of Labour and Women's movements; imperialism and decolonization; race and ethnicity; film and social change. **(3 cr)**

HIS 3214 Early Ireland 1300-1800 Early Ireland from the Norman invasions to the Action of Union (1800); cultural history and early struggles for independence. **(3 cr)**

HIS 3216 Ireland Since 1800 The social and political history of the Irish state in the 19th and 20th centuries. **(3 cr)** *Sem 1.*

HIS 3221 The French Revolution and Napoleon Causes, nature and course of the French Revolution, including a study of its historical interpretation, and the Napoleonic aftermath of the Revolution. **(3 cr)**

HIS 3222 History of Modern France Major developments, problems, and policies connected with the evolution of the French nation and its empire from 1815 to the present. **(3 cr)**

HIS 3233 Hitler and Nazi Germany Germany from the rise of Hitler to the end of the Second World War. **(3 cr)** *Sem 1.*

HIS 3234 Divided Germany to Union, 1945-1990 The end of the Second World War, the division of Germany, the Cold War, Detente, reunification, and contemporary problems. **(3 cr)** *Sem 2.*

HIS 3241 Imperial Russia, 1700 to 1914 Major political, economic and social changes from the end of the Muscovite tsars and the rule of Peter the Great to the outbreak of World War I. Topics include Russia's industrial revolution and revolutionary movements. **(3 cr)** *Sem 1.*

HIS 3242 Russia and the Soviet Union in the 20th Century Russia from the 1917 Revolution to the present; the radical transformation of a state, economy and society in revolution and civil war, the Stalin dictatorship, the trial of World War II, and the patterns of reform and continuity in the post-Stalin and post-Soviet eras. **(3 cr)**

HIS 3321 Science and Technology in Modern History Non-technical survey of the origins and impact of developments in science and technology during the modern era. Special attention to the Scientific Revolution, the theory of evolution, synthetic chemicals, modern physics and the dilemmas of nuclear power, and molecular biology and biomedical technology. (3 cr) *Sem 2.*

HIS 3323 Science, Art, and Invention since 1790 Interactions among science, technology and art that have shaped modern culture since the industrial revolution of the late 18th century. Special attention to the sources, styles, and contexts of creativity in various fields. (3 cr)

HIS 3325 From Frankenstein to Biomedical Engineering The origins of artificial life forms by modern science, the perspective of involved scientists, literary observers, politicians and businessmen, and society as a whole. Topics include cloning, transplantation, artificial organs, genetic engineering, and artificial intelligence. (3 cr)

HIS 3351 19th Century European Society and Thought Social impact of the Industrial Revolution, Liberal and Marxist critiques, scientific impact on social and religious thought, imperialism and Social Darwinism, challenges to gender and sexual traditions. (3 cr) *Sem 1.*

HIS 3352 Seminar on European Thought in the 20th Century A survey of ideas about the individual and society, with attention to Freud, Kafka, Einstein and Sartre; theories of Communism, Nazism and Democracy; the holocaust; emergence of the welfare state; internationalism through EEC, the United Nations; ecumenism in religion, and ecology. (3 cr)

HIS 3360 European Women's History to 1800 Roles of women from the Ancient world to revolutionary France, including analyzes of the status of women in Biblical, Greek, Roman, medieval, early modern and Enlightenment cultures and times. Themes of motherhood, women's work, women in literature and women's ways of exerting control over their lives. (3 cr)

HIS 3361 Women and Society in Modern Europe The changing roles of women in society and politics in Europe from the 18th to 20th centuries. Topics include women and the household economy; women and revolution; feminism and feminist movements; the rise of female professions; women's literature and feminist critical theory. (3 cr)

HIS 3995 Topics in European History Selected topics in European history of interest to faculty and students. (3 cr)

NON-WESTERN CIVILIZATIONS

HIS 4031 Islamic Civilization to 1800 The Islamic World from the seventh century through the eighteenth century with special emphasis on its cultural, social, and political history and contributions. (3 cr)

HIS 4041 History of the Modern Middle East The political, economic and social history of the Middle East with emphasis on the passing of imperial institutions and emergence of republics, trade and commerce, colonialism, and revolutionary movements. (3 cr) *Sem 1.*

HIS 4045 Middle Eastern Political Structures Transformation in the political and administrative structures of the Middle East from the seventh century through the twentieth century. Emphasis on the functioning of dynastic empires and household bureaucracies, and the emergence of military cadres and democratic republics. (3 cr)

HIS 4076 Jewish History The relation of the Jews to the historical process; the Jews in relation to the larger civilizations in which they have lived; Jewish intellectual and moral contributions; Jewish history in the Christian world; the Holocaust; formation of a Jewish homeland, Israel. (3 cr) *Sem 2.*

HIS 4090 Women in the Middle East Roles of Middle East women from the seventh century to the present ear. Women's lives and experiences, with emphasis on their influence and contribution to the economy, olitics, and literature and the arts. Attention to the effects of regional, ethnic, class, and religious differences on women's status and activities. (3 cr)

HIS 4095 Topics in Middle Eastern History (3 cr)
Selected topics in Middle Eastern history of interest to faculty and students. (3 cr)

HIS 4115 The Roots of African Culture (3 cr)
Early African history and anthropology culminating in the emergence of Africa as an arena of European economic penetration, the rise of the African slave trade, and the impact of early European colonization. (3 cr)

HIS 4120 The Emergence of Modern Africa (3 cr)
The impact of 19th century European colonialism on Africa; the division of Africa into European dependencies; change and continuity in African culture; the emergence of independent African nation states after World War II; their difficulties and opportunities. (3 cr) *Sem 2.*

HIS 4130 Southern Africa in Historical Perspective (3 cr)
Development of southern Africa, with particular emphasis on the formation of South Africa; Interaction of the various African peoples and the Europeans who came to settle the region and the way in which that interaction led to the establishment of, and resistance to, the system of apartheid. The collapse of apartheid. (3 cr)

HIS 4195 Topics in African History (3 cr)
Selected topics in African history of interest to faculty and students. (3 cr)

HIS 4315 China and Japan to 1850 (3 cr)
The traditions and influences that formed the civilization of China before modern times. (3 cr) *Sem 1.*

HIS 4320 China and Japan since 1850 (3 cr)
Contact with the West, evolutions of the modern states of East Asia, and the background of contemporary international problems. (3 cr) *Sem 2.*

HIS 4330 China in the 20th Century (3 cr)
China during its republican and Communist periods. (3 cr) *Sem 1.*

HIS 4335 Japan in the 20th Century (3 cr)
The development of the modern industrial Japanese state. (3 cr) *Sem 2.*

HIS 4395 Topics in Asian History (3 cr)
Selected topics in Asian history of interest to faculty and students.

(3 cr)

HIS 4410 Colonial Latin America (3 cr)
Indigenous cultures of the Americas; Spanish conquest and colonization; revolution of multi-cultural societies; political and economic institutions; Catholicism and popular religion; Enlightenment and the struggle for independence. Emphasis on the enduring legacy of the colonial experience. (3 cr) *Sem 1.*

HIS 4415 Latin American since Independence (3 cr)
Common Challenges and diverse national experiences in Latin America since independence, with emphasis on issues of race, class, and national identity; political stability and democracy; economic development and revolutionary change; popular and institutional religion; poverty and progress; migration and urbanization. (3 cr)

HIS 4420 Latin American Revolutions (3 cr)
Twentieth century social movements and ideologies designed to challenge the colonial legacy of economic dependency, underdevelopment, and notions of class, race and gender. Themes include violent social revolution (Mexico, Cuba), democratic revolution (Chile), alternative visions (Liberation Theology), and forces outside the region that contribute to their success or failure. (3 cr)

HIS 4425 Mexico (3 cr)
Indigenous civilizations and Spanish conquest; evolution of a mestizo society; independence, liberal democracy, and dictatorship; the Mexican Revolution and the one-party state; the contemporary transition to democracy and neo-liberalism. (3 cr)

HIS 4495 Topics in Latin American History (3 cr)
Selected topics in Latin American history of interest to faculty and students. (3 cr)

COMPARATIVE HISTORY

HIS 4520 The World in the Twentieth Century I (3 cr)
The political, diplomatic, economic, and social upheavals from 1900 to the Munich Conference. (3 cr) *Sem 1.*

HIS 4525 The World in the Twentieth Century II (3 cr)
The Second World War, its aftermath, the Atomic

Age, the emerging nations. (3 cr) *Sem 2.*

HIS 4620 20th Century Military History The major wars of the 20th century: World War I, World War II, Korea and Vietnam. cold war, wars of liberation. (3 cr) *Sem 2.*

HIS 4660 The World at War, 1939-1945 The origins of World War II; the collapse of collective security and the Stalin-Hitler pact; Soviet-German relations, 1939-1941; the war in the West, 1940-1941; the German-Russian war, 1941-1945; Allied and Axis war aims; Europe under German occupation; Grand-Alliance strategy, 1941-1945; the war in the air and on the seas; the Pacific theater, 1941-1945. (3 cr) *Sem 2.*

HIS 4700 The “War Lords” of World War II The military leaders of the Second World War in both the European and Pacific theaters. (3 cr)

HIS 4800 Third World Revolution Comparative social analysis of the effects of European colonialism, especially underdevelopment and national liberation struggles. India, China, Vietnam, Black Africa, Cuba, and the Arab World. (3 cr)

HIS 4850 The War in Vietnam The War in Vietnam in historical perspective from colonialism to the Cold War and national liberation. (3 cr) *Sem 1.*

HIS 4995 Topics in Comparative History Selected topics in non-Western and world history of interest to faculty and students. (3 cr)

ADVANCED SEMINARS AND INDEPENDENT STUDY

HIS 5501 Seminar in Historical Methodology Student research and reports. Seminar format. (3 cr) **Two hours a week.** *Sem 1&2. Prereq: History major with junior standing.*

HIS 5515 Independent Research An intensive research project under individual direction; may be taken in place of the HIS 5501 requirement. (3 cr) *Sem 1&2. Prereq: History major with junior standing; permission of the chair required.*

HIS 5551 Senior Thesis I An intensive research course under individual direction. May be taken in place of HIS 5501. (3 cr) *Sem 1&2. Prereq: History major with senior standing and permission of the chair.*

HIS 5552 Senior Thesis II A continuation of HIS 5551. May be taken in conjunction with HIS 5551 in one semester or sequentially with it in two semesters. (3 cr) *Sem 1&2. Prereq: History major with senior standing and permission of the chair.* The following courses may also be taken for credit in History:

AAH 1101 Beginnings to Renaissance

AAH 1102 Renaissance to Contemporary World

PSC 4200 South Asia: People and Politics

PSC 4300 Southeast Asia: People and Politics

PHI 3700 Philosophy of History

HONORS PROGRAM

Director and Associate Professor: Goff

Assistant Director: Nancy Hensler

Office: 103 St. Augustine Center, tel. 519-4650

The Villanova Honors Program is a comprehensive four-year curriculum of small seminars designed to foster the free and open exchange of ideas among students and faculty. Honors courses emphasize extensive reading and writing, and attempt to develop the critical abilities of judgment and analysis. Innovative courses include team-taught seminars and seminars given by visiting professors. All Honors courses are enriched by a variety of lectures, cultural events, and social activities. Students in the College of Liberal Arts and Sciences may receive the degree of B.A. or B.S., Honors Program. The Honors Program Sequence in Liberal Studies is open to students in all colleges.

B.A.H. DEGREE: Twelve Honors courses, including the Humanities or Social Science Seminar, a five-credit or six-credit senior thesis, and three upper-level courses (HON 2500 or above) not used to fulfill core requirements.

B.S.H. DEGREE: Ten Honors courses, including the Natural Science Seminar, a senior thesis, and three upper-level courses which may be used to fulfill core requirements. (Two Honors laboratory sections are the equivalent of one course.)

HONORS PROGRAM SEQUENCE IN LIBERAL STUDIES(CONCENTRATION): Eight courses in Honors, at least three of which must be upper-level.

All Honors Program certifications require a minimum overall QPA of 3.25. Honors classes may be used to fulfill liberal arts requirements and electives. For first- and second-year students, the Program offers Honors seminars in place of the core curriculum introductory courses in the humanities, social sciences, and natural sciences. Some students are invited to take multi-credit, team-taught interdisciplinary seminars (HON 1000, 1050, 2000 series) which examine the major works of Western Civilization in place of regular core requirements. This Honors core culminates with specially-designed seminars on methodology, current issues, and ethical questions in the humanities, social sciences, or natural sciences. On the advanced level, the Honors Program offers a variety of seminars that include traditional themes of enduring significance, timely issues of concern, and interdisciplinary studies not available elsewhere in the college. All have in common small student enrollment, active class participation, and intensive writing requirements. Specific offerings change from semester to semester to reflect the interests of faculty and students in the Program. All upper-level seminars also fulfill major and minor requirements in specific academic disciplines.

Admission to the Honors Program is by invitation or by application to the Director. Members of the Program are expected to take Honors courses at least every other semester, and to maintain high academic standards. Individual Honors courses are open to all Villanova students who have at least a 3.0 overall QPA or will bring a special expertise to the course, contingent upon class size limitations. Admission to all Honors courses requires the permission of the Director.

FIRST/SECOND YEAR COURSE OFFERINGS

HON 1000 Interdisciplinary Humanities I: Philosophy Major works and ideas from the classical Graeco-Roman and Christian traditions.

Emphasis on philosophical ideas. Extensive reading and writing requirements. Team-taught. **(3 cr)**
Sem 1. Two coreq: HON 1001, 1002, 1003.

HON 1001 Interdisciplinary Humanities I:

Literature Major works and ideas from the classical Graeco-Roman and Christian traditions. Emphasis on literature and drama. Extensive reading and writing requirements. Team-taught. (3 cr) *Sem 1. Two coreq: HON 1000, 1002, 1003.*

HON 1002 Interdisciplinary Humanities I: History Major works and ideas from the classical Graeco-Roman and Christian traditions. Emphasis on historical development. Extensive reading and writing requirements. Team-taught. (3 cr) *Sem 1. Two coreq: HON 1000, 1001, 1003.*

HON 1003 Interdisciplinary Humanities I: Religion Major works and ideas from the Graeco-Roman and Christian traditions. Emphasis on religious thought and development. Extensive reading and writing requirements. Team-taught. (3 cr) *Sem 1. Two coreq: HON 1000, 1001, 1002.*

HON 1050 Interdisciplinary Humanities II: Philosophy Major works and ideas from the Medieval period to the French Revolution. Emphasis on the evolution in philosophy from medieval to modern. Extensive reading and writing requirements. Team-taught. (3 cr) *Sem 2. Two coreq: HON 1051, 1052, 1053, 1054.*

HON 1051 Interdisciplinary Humanities II: Literature Major works and ideas from the Medieval period to the French Revolution. Emphasis on the evolution in literature from medieval to modern. Extensive reading and writing requirements. Team-taught. (3 cr) *Sem 2. Two coreq: HON 1050, 1052, 1053, 1054.*

HON 1052 Interdisciplinary Humanities II: History Major works and ideas from the Medieval period to the French Revolution. Emphasis on the historical evolution from medieval to modern in thought and institutions. Extensive reading and writing requirements. Team-taught. (3 cr) *Sem 2. Two coreq: HON 1050, 1051, 1053, 1054.*

HON 1053 Interdisciplinary Humanities II: Religion Major works and ideas from the Medieval period to the French Revolution. Emphasis on the evolution from medieval to modern in religious thought and institutions. Extensive reading and writing requirements. Team-taught. (3 cr) *Sem 2.*

Two coreq: HON 1050, 1051, 1052, 1054.

HON 1054 Interdisciplinary Humanities II: Political Science Major works and ideas from the Medieval period to the French Revolution. Emphasis on the evolution in political thought from medieval to modern. Extensive reading and writing requirements. Team-taught. (3 cr) *Sem 2. Two coreq: HON 1050, 1051, 1052, 1053.*

HON 1070 Biology for Today See BIO 1505. Lecture with BIO 1505; Honors laboratory section. (4 cr) *Sem 1.*

HON 1073 Concepts of the Gene Thematic development of concepts of the gene. Laboratory exercises include exploration of issues through problem-based learning methods. (4 cr) *Sem 2. Prereq: HON 1070 or BIO 1505.*

HON 1075 General Biology I & Laboratory See BIO 2105. Lecture with BIO 2105; Honors laboratory section. (4 cr) *Sem 1.*

HON 1076 General Biology II & Laboratory See BIO 2106. Lecture with BIO 2106; Honors laboratory section. (4 cr) *Sem 2.*

HON 1080 Principles of Microeconomics The price system; demand and supply analysis; the production process; analysis of market structures. (3 cr) *Sem 1&2.*

HON 1081 Principles of Macroeconomics The economic system and its fundamental principles; economic functions of government, monetary and fiscal policy, and international trade. (3 cr) *Sem 1&2.*

HON 1090 The Legal Environment of Business and Society The sources, nature and substantive principles of American law; its moral and ethical dimensions; the judicial process; comparison with other legal systems; impact of government regulations. (3 cr) *Sem 1&2.*

HON 1219 Artificial Intelligence Formal systems, modeling of intelligent processes by computer programs, representation of knowledge; Natural Language Processing. Historical and philosophical

foundations of AI. (3 cr) *Sem 1&2.*

HON 1241 Ancient, Medieval and Renaissance

Thought Core Humanities Seminar based principally on texts and readings drawn from primary sources up to 1650. Extensive written work and seminar discussions. Required readings: Hebrew and Christian scriptures, selections from the works of Augustine, Greek and Renaissance works. Readings from different genres and disciplines. Themes developed by the instructor in accordance with the selected readings. (3 cr) *Sem 1&2.*

HON 1242 Modern Thought: Enlightenment to the Present

Core humanities seminar based principally on texts and readings drawn from primary sources, 1650 to the present. Extensive written work and seminar discussions. Reading from each of the following five historical eras: Early Modern, Enlightenment, Romantic, Modernist, Contemporary. Readings from different genres and disciplines. Themes developed by the instructor in accordance with the selected readings, including a specific Augustinian theme. (3 cr) *Sem 1&2.*

HON 1331 The Literary Experience

Introduction to literature and methods of literary analysis. Close readings of texts from a variety of perspectives; includes works from a range of genres and periods. Extensive writing requirements. (3 cr) *Sem 1&2.*

HON 1380 Ethics

Major Western ethical traditions as they apply to selected contemporary ethical problems, with special consideration of Jewish and Christian perspectives. This course satisfies the Arts and Sciences Writing Enriched requirement. (3 cr) *Sem 1&2.*

HON 1433 Themes in Ancient and Medieval

History Significant themes in classical and medieval history, including cultures that gave rise to the civilizations of Western Europe: Israel, Greece, Rome, early Christianity. Emphasis on primary sources. (3 cr) *Sem 1&2.*

HON 1501 Language and Computation

Introduction to linguistics and its role in the development of computer languages and technologies. Topics include conceptual issues in linguistics, computation, and grammars as

generative devices for computer languages. Philosophical and historical perspectives on the “cognitive Revolution”. (3 cr)

HON 1601 Mathematical Ideas Mathematical ideas that have influenced other disciplines and the field of mathematics. Designed for students not intending further study in mathematics. Calculus not required. (3 cr) *Sem 1.*

HON 1755 Introduction to Philosophy Issues of God, persons and nature, and knowledge. Special consideration of classical and Christian perspectives. (3 cr) *Sem 1&2.*

HON 1771 General Physics I Laboratory

Experiments in mechanics, heat, and sound with emphasis on individual and group research. (1 cr) *Sem 1. Coreq: PHY 1100.*

HON 1772 General Physics II Laboratory

Experiments in light and electricity with emphasis on individual and group research. (1 cr) *Sem 2. Coreq: PHY 1102.*

HON 1801 Introduction to American Government

Fundamentals of American government: foundation in political thought, separate and collective functions of government structures, policy, role of individual in system. (3 cr) *Sem 1&2.*

HON 1802 Introduction to International Relations

Factors in relations between states; the nature, elements, and role of power; problems faced by the modern state system. (3 cr) *Sem 1&2.*

HON 1811 General Psychology

Fundamental concepts of psychology, with emphasis on the description of normal human behavior and its underlying factors. (3 cr) *Sem 1&2.*

HON 1825 Christianity: Traditions and

Transitions Major themes of the Christian traditions from historical, scriptural, and theological perspectives. (3 cr) *Sem 1&2.*

HON 1911 Introduction to Sociology

Fundamental concepts of sociological behavior, with emphasis on development of the social individual, collective and group behavior, social institutions and culture.

(3 cr) Sem 1.

HON 2000 Interdisciplinary Humanities III:

Philosophy Major works and ideas of the 19th and 20th centuries, with emphasis on philosophy.

Extensive reading and writing requirements.

Team-taught. **(3 cr) Sem 1. One Coreq: HON 2001, 2002, 2003, 2004.**

HON 2001 Interdisciplinary Humanities III:

Literature Major works and ideas of the 19th and 20th centuries, with emphasis on literature. Extensive reading and writing requirements. Team-taught.

(3 cr) Sem 1. One Coreq: HON 2000, 2002, 2003, 2004.

HON 2002 Interdisciplinary Humanities III:

History Major works and ideas of the 19th and 20th centuries, with emphasis on historical developments. Extensive reading and writing requirements.

Team-taught. **(3 cr) Sem 1. One coreq: HON 2000, 2001, 2003, 2004.**

HON 2003 Interdisciplinary Humanities III:

Religion Major works and ideas of the 19th and 20th Centuries, with emphasis on religious thought. Extensive reading and writing requirements. Team

taught. **(3 cr) Sem 1. One coreq: HON 2000, 2001, 20002, 2004.**

HON 2004 Interdisciplinary Humanities III: Social

Science Major works and ideas of the 19th and 20th centuries, with emphasis on social science thought. Extensive reading and writing requirements.

Team-taught. **(3 cr) Sem 1. One coreq: HON 2000, 2001, 2002, 2003.**

HON 2550 Humanities Seminar

Interdisciplinary study of distinctiveness of humanistic knowledge, humanist perspectives on the social and natural sciences, hermeneutics and interpretation, objectivism and relativism. **(3 cr) Sem 2.**

HON 2560 Social Science Seminar

Methodology of empirical and statistical analysis in the social sciences. Computer applications to data analysis, model designs and theory testing. **(3 cr) Sem 2.**

HON 2570 Natural Science Seminar

Methods and issues related to scientific research, including

representation and evaluation of data, value questions, and the nature of scientific certainty.

(3 cr) Sem 2.

UPPER-LEVEL COURSE OFFERINGS

Upper division courses and colloquia are offered by announcement. The specific topics for courses and colloquia appear in the master schedule for each semester.

HON 3000, 3050 Art History (3 cr)

HON 3100, 3150 Classics (3 cr)

HON 3200, 3250 Economics (3 cr)

HON 3300, 3350 Education (3 cr)

HON 3600, 3601, 3650, 3651, 3652, 3653 Literature (3 cr)

HON 3800, 3850 Geography (3 cr)

HON 4000, 4001, 4002, 4050, 4501, 4052 History (3 cr)

HON 4100, 4101, 4150, 4151 Mathematics (3 cr)

HON 4300, 4301, 4302, 4350, 4351, 4352 Philosophy (3 cr)

HON 4500, 4501, 4502, 4550, 4551, 4552 Political Science (3 cr)

HON 4700, 4701, 4750, 4751 Psychology (3 cr)

HON 4800, 4801, 4850, 4851 Theology and Religious Studies (3 cr)

HON 4900, 4901, 4950, 4951 Sociology (3 cr)

The courses listed below are representative of upper division courses taught in the Honors Program:

Abnormal Behavior Causal theories and social distribution of specific behaviors considered deviant or abnormal in the American population.

American Ethnic Folklore Cultural continuity,

adaptation, and change in ten U.S. ethnic cultures and subcultures. Perspectives from cultural anthropology, sociology, ethnohistory, and folklore. Fieldwork projects.

Concord Writers Emerson, Thoreau, Hawthorne, Alcotts in their literary and social contexts; social and cultural dynamics in 1840s small-town New England. Field trip to Concord, MA.

The Confessions of St. Augustine Intensive reading of first ten books of *The Confessions*; Augustine's life prior to Christian conversion.

Constitutional Criminal Law Case studies of United States Supreme Court decisions regarding rights and protections of persons charged with criminal violations: search and seizure, right to counsel, right against self-incrimination, line-ups, habeas corpus.

Critical Pedagogy Educational philosophies which address empowerment of students. Paulo Freire, Ira Shor, Kathleen Weiller.

Dark Ages Common themes of late Bronze and early Iron Ages of Greece, and early Medieval period: reliance in kinship groups, formal exchange of gifts as social bonds, frequent blood feuds, localized household economics, status of women.

Deconstruction and Religion Application of Deconstruction, the movement associated with Jacques Derrida, to such issues as the question of God, ethics, and the New Testament.

Feminist Theories Gender oppression theories: socialist feminist, radical feminist, Black feminist, Third World feminist, and postmodernism. Issues of weight and body, sexuality, racism, and the new feminist epistemology.

Hunger in Our Own Backyard: The United States & Philadelphia Physical and psychological effects, location, scope, contributing factors of hunger. Fieldwork activity integral to course.

Introduction to Ecology Factors affecting the distribution, abundance, and interactions of organisms. Climate patterns, biomes, physiological

and behavioral adaptations, population dynamics, species interactions, community structure, ecosystem function, and environmental problems. Hypothesis testing using statistical analysis of data. Emphasis on discussion of ecological applications and on collaborative approaches to lab/field exercises. Required overnight field trip.

Joyce's Ulysses Textual exegesis of Ulysses: Homeric parallel; organizational schemes; extrinsic contexts: literary Modernism, modern linguistic thought, Irish political and religious culture.

Latin American Themes Historical and contemporary analyses of complexities and contradictions of Latin American culture, institutions, and values through four themes: traditional vs. modern, race and class, economic development models, Catholicism.

Madness and Imagination Literary representations of madness as metaphor and reality. History of medical psychology and the reason/imagination dichotomy in artistic traditions.

Mass Media Portrayal of Political & Social Reality Critical analysis of mass media representation of political and social events.

Medical Machines: Ethical Issues in Medicine, Technology, and Public Policy Ethical and policy questions of medical technology: selection of recipients, informed consent, regulation and financing. Case studies include artificial heart, kidney dialysis, drug testing.

Political Campaigns and Elections Modern political campaigns, political rhetoric and images, campaign financing, mass media, and ethical issues. Frequent guest speakers.

Political and Social Thought of African Americans, 1890-1940 Development of African American social and political theory as response to the era's increased institutionalized racism. Washington, DuBois, Garvey, Locke; effectiveness of their rhetoric and actions.

Political Identity in the Arab World Influence of political patterns, ethnicity, minorities, and religion

on political identity. Interaction between secular nationalism and political Islam through ideas and actions of key political thinkers and organized political movements.

Powers of the Court Discretionary powers exercised by the courts in resolving complex constitutional issues. Use of injunctions to address civil disturbances, labor union strikes, divorces.

Renaissance Mannerisms in Italy Growth and development in Italian art after 1300. Major forms of Renaissance artistic expression and their relationship to contemporary art forms.

Russian Foreign Policy in Transition Motives and objectives of contemporary Russian foreign policy; their connections with policies of the former Soviet Union and with contemporary theories of international relations.

Sex Determination: Genetics and Environment Interplay of genetic, physiological, environmental and critical timing factors in determining sex. Data collection from primary literature within subdisciplines of biology; development of models and testable hypotheses; laboratory problem-based learning approach.

Spirituality in the North American Context Spiritual traditions, theories, and movements from 1500 to the present, and their influence on modern North American Christian spirituality.

Urban Realities/ Suburban Perspectives Crime, drugs, police review board, public housing, public welfare; impact of media on cities. Reality versus rumor in suburban views of city life.

World War I in History, Art, and Literature Impact of World War I on military and political history, intellectual movements, literature and visual arts, and the subsequent Modernist movement.

HON 5200 Ideas and Texts Six professors from as many disciplines analyze a text of significance that has had an impact on their own intellectual development. May be repeated for credit. (3 cr) *Sem 1&2.*

HON 5500 Independent Study and Research (3 cr) *Sem 1.*

HON 5501 Independent Study and Research (3 cr) *Sem 2.*

HON 5506 Independent Study and Research in Science (3 cr) *Sem 1.*

HON 5507 Independent Study and Research in Science (3 cr) *Sem 2.*

HON 5600 Seminar Reserved for Visiting Professors An open seminar to be used as deemed appropriate by visiting professors teaching in the Honors Program. (3 cr) *Sem 1&2.*

HON 5700, 5701, 5702, 5703, 5750, 5751, 5752, 5753 Colloquia Topics, themes, and treatment originated through student request or faculty interest; specific topics to be announced. (3 cr) *Sem 1&2.*

HON 5999 Proseminar: Research Strategies and Methods Fundamental concepts, terms, and practices of scholarly research in the humanities, including strategies for conducting exhaustive literature reviews, annotated bibliographies, and work-in-progress class presentations. Emphasis upon individual research projects in the specific disciplines of projected Senior Thesis topics. Required of students in the humanities and history who intend to pursue the six-credit Senior Thesis option. (3 cr) *Sem 2.*

HON 6000 Senior Thesis I Major independent research project under the direction of a thesis adviser. The first semester includes a comprehensive proposal and bibliography, research design, detailed outline, and substantive writing sample. (3 cr) *Sem 1&2. Prereq: HON 5999.*

HON 6001 Senior Thesis I Major independent research project under the direction of a thesis adviser. The first semester includes a comprehensive proposal and bibliography, research design, and preliminary outline. (2 cr) *Sem 1&2.*

HON 6002 Senior Thesis II Major independent research project under the direction of a thesis

adviser. In addition to completing the thesis, students must participate in the Senior Research

Conference and thesis defense. (3 cr) *Sem 1&2.*

LATIN AMERICAN STUDIES

Director and Professor: Ogden
Office: 304 St. Augustine Center, tel. 519-4640

The Latin American Studies Program is an interdisciplinary program providing courses, a minor and a concentration in Latin American Studies. It is open to students in all degree programs.

MINOR: Two courses in Spanish language training at or above the intermediate level and five additional courses (15 credits) as follows: HIS 4410, 4415, 4420, 4425, or 4495; PSC 4750 or ECO 4200; LAS. 1100 and two electives which can be taken either from the program core or from the list of electives.

Concentration: Two courses in Spanish language training beyond the intermediate level and six additional courses (18 credits) as follows: HIS. 4410, HIS. 4415, HIS. 4420, HIS. 4425 or HIS. 4495; PSC. 4750 or ECO. 4200; LAS. 1100; one course in Latin American literature and two electives, which can be taken either from the program core or from the list of electives.

Program Core:

ECO 4200 Special Topics: The Economics of Latin American and the Caribbean	SPA 1121 Intermediate Spanish I
HIS 4410 Colonial Latin America	SPA 1122 Intermediate Spanish II
HIS 4415 Latin America since Independence	SPA 1131 Conversation and Composition
HIS 4420 Latin American Revolutions	SPA 1132 Advanced Conversation and Composition
HIS 4425 Mexico	SPA 1138 Advanced Grammar
HIS 4495 Topics in Latin American History	SPA 2143 Spanish American Civilization
HON 4000 Latin American Themes	SPA 2212 Survey of Spanish American Literature
LAS 1100 Latin American Seminar	SPA 2213 Spanish American Theater
LAS 3412 Special Topics	SPA 2214 Spanish American Novel
PSC 4750 Latin American Politics	SPA 2215 Spanish American Short Story
S OC 6500 Seminar in Sociology: Third World Development: Latin America	SPA 3822 Spanish American Poetry

Elective courses:

HIS 4490 Topics in World History: Racism and Justice in the Americas	SPA 1133 Business Spanish I
PSC 5800 Politics of International Economics	SPA 1134 Business Spanish II
SOC 3600 Race and Ethnic Relations	THL 3740 Liberation Theologies
SOC 3750 Human Populations	THL 4600 North/South Development Ethics

MATHEMATICAL SCIENCES

Chair and Associate Professor: Styer

Professors: DeVos, Fleischman, Hartmann, Marrero, Sprows, Woldar

Associate Professors: Feeman, Gluchoff, Jantzen, Kleiber,
Levitan, Longman, Lynn, Norton, Pigeon, Pollack-Johnson, Rhodes, Roy, Volpert

Assistant Professors: Ashley, Bartlow, Belkin, Borchardt, Buckley,
Deanin, Seliktar, Short,

Instructors: Chiacchiere, Santomas

Office: 305 St. Augustine Center, tel. 519-4850

FRESHMAN CALCULUS: Prospective first year Villanova students who have completed a year's study of calculus in high school should take the CEEB advanced placement test for possible credit for the first course at Villanova.

MAJOR: MAT 1500, 1505, 2500, 2600, 2705, 3300, 3305, 3400, 3500, and 5900; PHY 2410/2411 and either PHY 2412/2413 or PHY 2414/2415; four additional mathematics courses numbered 3505 and above; and one additional science course (with laboratory if appropriate). Students interested in graduate study in mathematics should satisfy their language requirement with French, German or Russian and should consider taking another of these languages as an elective.

MINOR: MAT 1500, 1505, 2500, 2600, plus four courses chosen from MAT 2705, 2710, and courses numbered 3000 or higher. Students may petition to substitute an approved upper division course (e.g., CSC 4170, ECE 3720, PHY 4202, CEE 3702) in his/her major for one of these four courses.

MAT 1010 Math Anxiety Workshop

Alleviation and avoidance of the negative thoughts and feelings people have when confronted with numbers, graphs, statistics, etc. in math situations by changing attitudes and discovery of approaches to math best suited for them. **(1 cr)** *Grading: P/F.*
Six two-hour meetings.

MAT 1210 Mathematical Concepts Topics selected from logic, number theory, finance, set theory, geometry, applied linear algebra, calculus. Not open to students who have completed MAT 1505. **(3 cr)**

MAT 1220 Discrete Mathematics with Social Sciences Applications Discrete mathematics for the Liberal Arts student: voting methods, weighted voting, fair division, apportionment, circuits, network, trees, directed graphs, planning and scheduling, linear programming, growth and symmetry. Not open to students who have completed MAT 1505. **(3 cr)**

MAT 1230 Introductory Statistics I

Probability and statistics for the Liberal Arts student: displaying and summarizing data, basic probability concepts, mathematical expectation, binomial and normal distributions, normal approximation to the binomial. Not open to students who have completed MAT 1505. **(3 cr)**

MAT 1235 Introductory Statistics II

Sampling distributions, inferences about means, variances and proportions, contingency tables, analysis of variance, regression and correlation. Not open to students who have completed MAT 1505. **(3 cr)** *Prereq: MAT 1230.*

MAT 1250 Statistics in Health-Care Research

Descriptive and inferential statistics: graphical displays, estimation, hypothesis testing. Open to Nursing students; others by special permission only. **(3 cr)**

MAT 1310 Calculus with Life Sciences

Applications I Functions, algebra of real functions, polynomials, allometric functions, exponential and logarithmic functions, trigonometric functions,

graphing, log-log and semilog graphs, sequences, difference equations, limits, continuity, the derivative, the chain rule, higher order derivatives, maxima and minima, curve sketching, applications to biology. **(3 cr)**

MAT 1315 Calculus with Life Sciences

Applications II The mean-value theorem, Taylor's polynomial approximations, the anti-derivative, the definite integral, area, numerical integration, applications of the integral, techniques of integration, indeterminate forms, L'Hôpital's rule, improper integrals, introduction to differential equations with applications to biological systems, numerical solutions using the computer, applications in the life sciences. **(3 cr)** *Prereq: MAT 1310.*

MAT 1320 Calculus I Calculus for Liberal Arts students: polynomial, rational and transcendental functions, the derivative, numerical and graphical introduction to integration. **(3 cr)**

MAT 1325 Calculus II Techniques of differentiation and integration, applications and further developments of calculus. **(3 cr)** *Prereq: MAT 1320 or equivalent.*

MAT 1330 Quantitative Analysis for Business I Analysis of single variable problems: problem formulation, translation between mathematical symbols and verbal descriptions, single variable modeling with real data, rates of change, techniques of differentiation, optimization, post-optimality analysis, continuous probability distributions, integrals, Fundamental Theorem of Calculus. **(3 cr)**

MAT 1335 Quantitative Analysis for Business II Analysis of multivariable problems: problem formulation, translation between mathematical symbols and verbal descriptions, multivariable modeling with real data, regression analysis, partial derivatives and unconstrained optimization, Lagrange multipliers and constrained optimization, matrix algebra, linear programming. **(3 cr)** *Prereq: MAT 1330.*

MAT 1500 Mathematical Analysis I Limits, differentiation (definition, tangent lines, rates of change, techniques, trigonometric functions, implicit differentiation, related rates), applications of

differentiation (graphing, optimization), integration (indefinite, definite, area, applications), introduction to vectors. Use of a computer algebra system, e.g. MAPLE. **(4 cr)**

MAT 1505 Mathematical Analysis II Further applications of integration, transcendental functions (logarithms, exponential functions, inverse trigonometric functions), techniques of integration, L'Hôpital's rule, infinite series. Continued use of a computer algebra system. **(4 cr)** *Prereq: MAT 1500.*

MAT 1903 Internship Elective (3 cr)

MAT 1906 Internship Elective (6 cr)

MAT 1909 Internship Elective (9 cr)

MAT 2100 Theory of Interest Interest measurements: accumulated and present value factors, annuities certain, amortization schedules, sinking funds, bonds and related securities. **(3 cr)** *Prereq: Two semesters of calculus.*

MAT 2310 Statistics for Experimenters The design and analysis of experiments, probability distributions, basic statistical inference, analysis of variance, block designs and factorial designs. For social and natural science majors. **(3 cr)** *Prereq: Two semesters of calculus.*

MAT 2500 Mathematical Analysis III Parametric equations, polar coordinates, multivariable functions, partial derivatives, multiple integration, line integrals, vector analysis. Continued use of a computer algebra system. **(4 cr)** *Prereq: MAT 1505.*

MAT 2600 Foundations of Mathematics Topics selected from natural numbers, mathematical induction, irrational and transcendental real numbers, complex numbers, Fundamental Theorem of Algebra, infinite cardinals, symbolic logic, functions and relations, iterated functions, mathematical chaos. **(3 cr)** *Prereq: MAT 1500.*

MAT 2705 Differential Equations with Linear Algebra First order differential equations, matrices, second order linear equations, linear spaces, linear transformations, eigenvalues and eigenvectors,

systems and higher order equations. **(4 cr)** *Prereq:* MAT 1505.

MAT 2710 Advanced Mathematical Analysis II Complex number system, analytic functions, Cauchy-Riemann equation, Cauchy integral formula, power series, Laurent expansion, residues, applications to Fourier and Laplace Transforms, differential equations. **(4 cr)** *Prereq:* MAT 2500, 2705.

MAT 2930 History of Mathematics History of arithmetic, algebra, geometry, trigonometry, calculus, and probability from ancient times to the nineteenth century. **(3 cr)** *Prereq:* MAT 1505, 2600.

MAT 2993 Internship (3 cr)

MAT 2996 Internship (6 cr)

MAT 3300 Advanced Calculus I Real numbers, ordering of the reals, lub and glb, density of the rationals, sequences, limits, algebra of convergent sequences, completeness of the reals, continuous functions, Intermediate Value Theorem, Taylor's Formula, L'Hôpital's rule, Riemann integral, Fundamental Theorem of Calculus. **(3 cr)** *Prereq:* MAT 2500, 2600.

MAT 3305 Advanced Calculus II Infinite series, absolute and conditional convergence, function sequences, pointwise and uniform convergence, Weierstrass Approximation Theorem, power series, Euclidean and metric spaces, topology of metric spaces, continuous transformations, differential calculus in Euclidean spaces. **(3 cr)** *Prereq:* MAT 3300.

MAT 3400 Linear Algebra Vector spaces, linear transformations, self-adjoint and normal operators, bilinear and Jordan forms. **(3 cr)** *Prereq:* MAT 2705.

MAT 3500 Modern Algebra I Topics selected from groups and subgroups, cyclic groups, permutation groups, isomorphisms, direct products, cosets and Lagrange's Theorem, normal subgroups and factor groups, group homomorphisms, the Fundamental Theorem of Finite Abelian Groups, rings, fields. **(3 cr)** *Prereq:* MAT 2600 and MAT 2705.

MAT 3505 Modern Algebra II Topics selected from rings, subrings, integral domains, ideals and factor rings, ring homomorphisms, polynomial rings, fields, extension fields, finite fields. **(3 cr)** *Prereq:* MAT 3500.

MAT 4110 Combinatorics Induction, permutations and combinations, general counting methods, generating functions, recurrence relations, principle of inclusion-exclusion, graph theory, trees, planarity, crossing numbers, Hamiltonian cycles, Eulerian tours. **(3 cr)** *Prereq:* MAT 1505.

MAT 4270 Numerical Analysis Numerical and computational aspects of root-finding methods, interpolation and polynomial approximation, numerical differentiation and integration, approximation theory. **(3 cr)** *Prereq:* MAT 1505 and ability to write programs in a high-level programming language.

MAT 4310 Statistical Methods Data displays and summarization, probability distributions, point and interval estimation, hypothesis testing, categorical data analysis, regression and correlation. **(3 cr)** *Prereq:* MAT 1505.

MAT 4410 Mathematical Modeling Model formulation, the modeling process, graphs as models, examples from the physical and social sciences, parameter estimation, experimental modeling, dimensional analysis, modeling discrete and continuous dynamic behavior, implementation. **(3 cr)** *Prereq:* MAT 2705.

MAT 4600 Deterministic Operations Research Deterministic methods: mathematical optimization, linear programming, formulation and solution techniques, duality, integer linear programming, transportation problem, assignment problem, network flows, dynamic programming. **(3 cr)** *Prereq:* MAT 2705. *MAT 4600 and MAT 4610 are independent courses; neither one is a prerequisite for the other.*

MAT 4610 Stochastic Operations Research Probabilistic methods: brief review of probability, transient and asymptotic properties of Markov chains, queuing models and their applications, Markov decision processes, optimal inventory

policies, forecasting game theory, simulation. **(3 cr)**
Prereq: MAT 2705. MAT 4600 and MAT 4610 are independent courses; neither one is a prerequisite for the other.

MAT 5110 Topics in Geometry Topics selected from affine, hyperbolic, spherical, elliptic, Euclidean or projective geometry. **(3 cr)**

MAT 5200 Theory of Numbers Congruences, quadratic reciprocity, Diophantine equations; applications. **(3 cr)** *Prereq: MAT 2600 or permission of instructor.*

MAT 5400 Complex Analysis Algebra of complex numbers, analytic functions, Cauchy-Riemann equations, Laplace equations, conformal mapping, integrals of complex functions, Cauchy's theorem, power series, Taylor's theorem, Laurent's theorem, residues, entire functions. **(3 cr)** *Prereq: MAT 2500.*

MAT 5500 Topology Elements of point-set topology including subspaces, product spaces and quotient spaces, compactness, connectedness, topology of subsets of \mathbb{R}^n , manifolds. **(3 cr)** *Prereq: MAT 2500.*

MAT 5600 Differential Geometry Geometry of curves and surfaces, curvature, first and second fundamental forms, minimal surfaces, use of MAPLE. **(3 cr)** *Prereq: MAT 2500.*

MAT 5700 Mathematical Statistics I Probability, random variables, joint distributions, expected values, limit theorems, distributions derived from the normal distribution. **(3 cr)** *Prereq: MAT 2500, 2705.*

MAT 5705 Mathematical Statistics II Survey

sampling, parameter estimation, hypothesis testing, two sample tests, analysis of variance, analysis of categorical data, linear least squares. **(3 cr)** *Prereq: MAT 5700.*

MAT 5900 Seminar in Mathematics Supervised study of selected topics or problems in mathematics, student presentations. May be repeated for credit if content is different. **(3 cr)** *Prereq: MAT 3300, 3500.*

MAT 5920 Topics in Applied Mathematics Lecture course in an area of applied mathematics. May be repeated for credit if topics are different. *Prereq: As determined by instructor.*

MAT 5930 Topics in Pure Mathematics Lecture course in an area of pure mathematics. May be repeated for credit if topics are different. *Prereq: As determined by instructor.*

MAT 5991 Independent Study in Mathematics Reading in a selected branch of mathematics under the direction of a member of the staff. May be repeated for credit. **(1 cr)** *Prereq: Consent of instructor.*

MAT 5992 Independent Study in Mathematics Reading in a selected branch of mathematics under the direction of a member of the staff. May be repeated for credit. **(2 cr)** *Prereq: Consent of instructor.*

MAT 5993 Independent Study in Mathematics Reading in a selected branch of mathematics under the direction of a member of the staff. May be repeated for credit. **(3 cr)** *Prereq: Consent of instructor.*

MODERN LANGUAGES AND LITERATURES

Chair and Associate Professor: Julia

Professors: Alter, Goldberg, Helmetag, Ogden, Romero

Associate Professors: Mongeau, Omran, Pastore, Poeta, Roman

Assistant Professors: Chi, Hamada, Hart, Korsun, Nakagawa,

Peraita, Rigaud, Trujillo, Waggaman

Office: 303 St. Augustine Center, 519-4680

MAJORS: Majors in French, German or Spanish are required to take ten courses above the intermediate level. Once a sequence of language courses has begun, a student may not revert to a lower level course. French 2144 is required of all majors in French; Spanish 2211, 2212 and 3950 are required of all majors in Spanish. In addition, majors in French and German are required to take French 3950 or German 3950.

MINORS: Students may minor in Arabic, Chinese, French, German, Italian, Japanese, Russian or Spanish. Minors in Arabic, Chinese, Japanese and Russian must complete six courses in the language. For Minors in French, German, Italian and Spanish four courses above the intermediate level are required.

The Department also offers courses in foreign literatures in English translation. Such courses may be used to fulfill a Humanities elective; however, they may not be used toward credit requirements for a foreign language major or minor.

Students may obtain up to six credits through Villanova summer programs abroad in France, Chile, Germany, Italy and Spain.

NOTE: Courses marked with an asterisk (*) do not fulfill the Core Curriculum Language requirement.

ARABIC

Introductory Arabic I and II will fulfill the core requirement for a foreign language.

ARB 1111, 1112 Intensive Basic Modern Standard Arabic I and II Functional use of Modern Standard Arabic for students with no prior knowledge of Arabic. Recitations, readings and oral drills, supplementary language laboratory work. **(12 cr)** *Six hours a week. Sem 1&2.*

ARB 1121, 1122 Intensive Intermediate Modern Standard Arabic I and II Review of grammar and vocabulary. Recitations, readings and oral drills. Supplementary language laboratory work. **(10 cr)** *Five hours a week. Sem 1&2.*

ARB 1131, 1132 Intensive Advanced Arabic I and II Advanced communication skills including reading

and discussing topics on current events. Supplementary language laboratory work. **(10 cr)** *Five hours a week. Sem 1&2.*

ARB 1141 Introduction to Colloquial Egyptian Arabic Training in the use of colloquial Egyptian Arabic, focusing on listening and speaking skills. Supplementary laboratory work and drills. **(3 cr)**

ARB 2100 Arabic Literature in English Translation The major works of Arabic literature in translation. **(3 cr)** *Conducted in English.**

ARB 2141 The Arab-Andalusian Legacy The impact of the Arab period on the Iberian Peninsula from the historical, cultural and literary viewpoints. **(3 cr)**

ARB 2142 Arab Culture and Civilization

College of Liberal Arts and Sciences

Arab culture and civilization with emphasis on the Arab people's contribution to the arts and sciences. **(3 cr)**

CHINESE

Introductory Chinese I and II will fulfill the core requirement for a foreign language.

CHI 1111, 1112 Intensive Basic Chinese I & II
Functional use of Chinese for students with no prior knowledge of Chinese. Recitations, readings and oral drills. Supplementary language laboratory work. **(12 cr)** *Six hours a week, Sem 1&2.*

CHI 1121, 1122 Intermediate Chinese I & II
Review of grammar and vocabulary. Recitations, readings and oral drills. Supplementary language laboratory work. **(10 cr)** *Five hours a week. Sem 1&2.*

CHI 1131, 1132 Advanced Chinese I and II
Advanced communication skills including reading and discussing topics on current events. Supplementary language laboratory work. **(6 cr)** *Three hours a week. Sem 1&2.*

CHI 2143 Chinese Culture: Past and Present
Chinese culture and civilization from the beginning to the present. **(3 cr)***

CHI 2144 Chinese Literature in Translation The history and development of Chinese fiction from its beginning to the present. **(3 cr)** *Conducted in English.**

FRENCH

FRE 1111, 1112 Introductory French I and II
Groundwork in French, including oral proficiency, aural comprehension and reading; for students with no prior knowledge of French or only one year of high school French. Supplementary language laboratory work and oral drills. **(8 cr)** *Four hours a week. Sem 1&2.**

FRE 1113 French for Reading Knowledge
Essentials of grammar and exercises in expository French prose to prepare students for independent research in specialized fields. **(0 cr)**

FRE 1121, 1122 Intermediate French I and II

Review of grammar, composition, reading and conversation. **(6 cr)** *Three hours a week. Sem 1&2. Prereq: FRE 1111 and 1112, 2-3 years of high school French, or the equivalent.*

FRE 1131, 1132 Conversation and Composition I and II Intense practice in conversation and composition with emphasis on developing advanced language skills in French. A writing enriched course. **(3 cr)** *Prereq: FRE 1121, 1122, 4-5 years of high school French or the equivalent.*

FRE 1133, 1134 Practical French I and II
Business and professional writing and readings in applicable publications. **(6 cr)** *Three hours a week. Sem 1&2. Prereqs: FRE 1121 and 1122 or permission of the chair.*

FRE 1135 Advanced Grammar Systematic grammar analysis with comprehensive exercises and compositions. A writing enriched course. **(3 cr)** *Prereqs: FRE 1121, 1122 or the equivalent.*

FRE 1136, 1137 Contemporary French Language I and II Offered as part of the Villanova Summer Program at the University of Bourgogne/Dijon to provide practice in speaking and writing on an advanced level. The use of French in everyday situations and subject-related discussions. Students will read newspapers, magazines, advertising, and listen to broadcasts. **(6 cr)**

FRE 1141 Phonetics Intensive practical presentation of French phonetics and stylistic. **(3 cr)**

FRE 2100 French Literature in English Translation The major works of French literature in translation. **(3 cr)**. *Conducted in English.**

FRE 2101 French Literature and Film
Study of evolutionary relationship between 19th century realist Novel, pre-war poetic realism in film, post-war Nouveau Roman and Nouvelle vague cinema. **(3 cr)**

FRE 2142 French Civilization Study of French culture in its manifold aspects. **(3 cr)** *Prereqs: FRE 1121, 1122.*

FRE 2143 Contemporary France Offered as part of the Villanova Summer Program at the University of Bourgogne/Dijon. France's current role in the international, political, economical and cultural world, and its impact in the EEC. Oral presentations and independent research required. **(3 cr)**

FRE 2144 Explication de textes Close analyses of and textual commentary on representative selections. **(3 cr)** *Prereqs: FRE 1131, 1132.*

FRE 2215 French Women Writers French women writers from the Middle Ages to the present. **(3 cr)** *Prereqs: FRE 1131. Satisfies diversity requirement.*

FRE 2218 Introduction to Francophone Literature Representative selections of French writers of Black Africa, North Africa, the Caribbean, and Canada. Topic to be announced. **(3 cr)** *Satisfies diversity requirement.*

FRE 3211, 3212 Survey of French Literature I & II Close readings of representative texts from the Middle Ages to the 20th Century. **(6 cr)** *Prereq: FRE 1131 or the equivalent; either or both semesters for credit.*

FRE 3411 Medieval Literature The earliest texts, the *chanson de geste*, the romance, lyric, didactic, allegorical and satirical poetry and the prose writers of the Middle Ages. **(3 cr)**

FRE 3412 Special Topics Advanced study of topics of special interest in French literature. Topics to be arranged. Course may be repeated for credit. **(3 cr)**

FRE 3512 The Renaissance The *Pléiade* and the prose writers of the 16th Century. **(3 cr)** *Prereq: FRE 1131.*

FRE 3613 Seventeenth-Century Literature Analytical readings of major non-dramatic texts, 1620-1690. **(3 cr)** *Prereq: FRE 1131.*

FRE 3614 Classical Theatre Classical dramaturgy and modern interpretations of Corneille, Molière and Racine. **(3 cr)** *Prereq: FRE 1131.*

FRE 3715 Eighteenth-Century Literature I Study of the Enlightenment through the theater, novels and philosophical texts with special emphasis on Voltaire. **(3 cr)** *Prereq: FRE 1131.*

FRE 3716 Eighteenth-Century Literature II Philosophical, revolutionary and sentimental writings with special emphasis on Rousseau. **(3 cr)** *Prereq: FRE 1131.*

FRE 3717 Eighteenth and Nineteenth-Century Theatre Development of the French theatre from the Classical tradition of the eighteenth century to the Romantic drama of the nineteenth. **(3 cr)** *Prereq: FRE 1131.*

FRE 3818 Romanticism The poetry, novel, short story and drama of the romantic period. **(3 cr)** *Prereq: FRE 1131.*

FRE 3819 Realism and Naturalism Realism and naturalism in the French novel and theatre with emphasis on Balzac, Flaubert and Zola. **(3 cr)** *Prereq: FRE 1131.*

FRE 3820 The Post-Romantic Poets The development of French poetry and poetic theory from Baudelaire to Mallarmé. **(3 cr)** *Prereq: FRE 1131.*

FRE 3921 Twentieth-Century Theatre Major stage works in text and performance from Jarry to Koltès. **(3 cr)** *Prereq: FRE 1131.*

FRE 3922 Twentieth-Century Novel Development of the novel in the first half of the 20th Century with emphasis on Proust, Gide, Mauriac, Green, etc. **(3 cr)** *Prereq: FRE 1131.*

FRE 3923 Post-World War II Writers French Literature since 1945, with emphasis on the novels and essays of Sartre, Simone de Beauvoir, Camus, Robbe-Grillet, and Le Clézio. **(3 cr)** *Prereq: FRE 1131.*

FRE 3950 Research Seminar Bibliographical principles and the techniques of literary research; preparation of a paper. **(1 cr)** *Prereq: Senior major in Modern Languages.*

Courses in English

FRE 4110 French Classical Theatre; Text and Theory Readings and discussions on the major dramatists and theorists of the French 17th Century. (3 cr) Prereqs: FRE 1131, 1132 or permission of the chair. Conducted in English.*

FRE 4120 Modern French Theatre The contemporary drama of France from its origin (King Ubu) to Beckett, Sartre, Genet, Ionesco and recent dramatists. (3 cr) Prereqs: FRE 1131, 1132 or permission of the chair. Conducted in English.*

FRE 4130 The Modern French Novel The search for identity and meaning in contemporary French fiction from Gide to Camus, Sartre and the new novelists. (3 cr) Prereqs: FRE 1131, 1132 or permission of the chair. Conducted in English.*

GERMAN

GER 1111, 1112 Introductory German I and II Groundwork in German, including oral, aural and reading skills. Supplementary oral drills. (8 cr) Four hours a week. Sem 1&2.

GER 1113 German for Translation Essentials of grammar and exercise for reading comprehension and translation. (0 cr)

GER 1121, 1122 Intermediate German I and II Review of grammar, composition, reading and conversation. (6 cr) Three hours a week. Sem 1&2. Prereq: GER 1111 and 1112, 2-3 years high school German, or the equivalent.

GER 1131, 1132 Conversation and Composition I and II Intensive practice in conversation and composition with emphasis on developing advanced language skills in German. Writing enriched. (3 cr) Prereq: GER 1121 and 1122, 4-5 years of high school German, or the equivalent.

GER 1133, 1134 Business German I and II Business and professional writing and readings in applicable publications. (6 cr) Three hours a week. Sem 1&2. Prereq: GER 1121 and 1122 or permission of chair.

GER 1135, 1136 Practical German I and II

Intercommunication with supplemental readings in newspapers and magazines. (6 cr) Three hours a week. Sem 1&2. Prereq: GER 1121 and 1122.

GER 2100 German Literature in English Translation The major works of German literature in translation. (3 cr) Course conducted in English.*

GER 2142 German Civilization and Culture to 1989 German civilization and culture from their beginnings until the fall of the Berlin Wall. (3 cr) Prereq: GER 1121, 1122.

GER 2143 German Culture and Civilization Since 1989 Contemporary German civilization and culture in their manifold aspects. (3 cr) Prereq: GER 1121, 1122.

GER 3211 Survey of German Literature I From its beginnings to 1750. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3212 Survey of German Literature II From 1750 through 1900. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3213 Survey of German Literature III: Modernism From 1900 through 1995. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3411 Medieval Masterpieces Selections from medieval German literature read in modern German. (3 cr)

GER 3412 Special Topics Topics of interest in German literature. Topics to be arranged. Course may be repeated for credit. (3 cr)

GER 3714 German Literature: Enlightenment to Romanticism Emphasis on Sturm and Drang. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3716 Goethe Study of selected works. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3717 German Drama in the Nineteenth Century The German drama from Romanticism to Naturalism, with emphasis on the major dramatic works of Kleist, Grillparzer, Büchner and Hebbel. (3 cr)

GER 3718 The German Novelle The German *Novelle* as a genre from Goethe to the 20th century. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3818 Romanticism The philosophy, lyric and prose of the Romantic period. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3819 Realism The major works of Poetic Realism. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3920 Austrian Literature Selected works of Austrian literature from 1850 to the present. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3921 Twentieth-Century Drama German drama from Naturalism to the present. (3 cr) Prereq: GER 1131 and 2142 or the equivalent.

GER 3922, 3923 Twentieth-Century Prose I and II Novels and short stories. (6 cr) Three hours a week. Prereq: GER 1131 and 2142 or the equivalent.

GER 3950 Research Seminar Bibliographical principles and the techniques of literary research; preparation of a paper. (1 cr) Prereq: Junior or Senior major in German.

Courses in English

GER 4110 German Epic Theatre Evolution of the genre culminating in the political documentary theatre. (3 cr) Prereq: GER 1131, 1132 or permission of the chair. Conducted in English.*

GER 4120 German Theatre and Film Plays by Brecht, Hasenclever, Kaiser, etc. Films such as *Caligari*, *Nosferatu*, *Metropolis*, *M*. (3 cr) Prereq: GER 1131, 1132 or permission of the chair. Conducted in English.*

GER 4140 150 Years of German Drama The main currents in German drama evolving into the modern period: Kleist, Grillparzer, Hebbel, Hauptmann, Kaiser, Brecht, Frisch, Duerrenmatt. (3 cr) Conducted in English.*

GER 4150 German Culture and Civilization The culture and civilization of the German-speaking countries. (3 cr) Prereq: GER 1131, 1132 or permission of the chair. Conducted in English.*

ITALIAN

ITA 1111, 1112 Introductory Italian I and II Groundwork in Italian, including oral proficiency, aural comprehension and reading for students with no prior knowledge of Italian. Supplementary language laboratory work and oral drills. (8 cr) Four hours a week. Sem 1&2.*

ITA 1121, 1122 Intermediate Italian I and II Review of grammar, composition, reading and conversation. (6 cr) Three hours a week. Sem 1&2. Prereqs: ITA 1111 and 1112 2-3 years of high school Italian, or the equivalent.

ITA 1131 Grammar and Composition Intensive practice in conversation and composition with emphasis on developing advanced language skills in Italian. Writing enriched. Course conducted in Italian. (3 cr) Prereq: ITA 1121, 1122, 4 years of high school Italian, or permission of the chair.

ITA 1132 Conversation and Composition Further practice in conversation and composition with focus on advanced proficiency in Italian. Course conducted in Italian. Writing enriched. (3 cr) Prereq: ITA 1131 or permission of the chair.

ITA 2100 Italian Literature in English Translation The major works of Italian literature in translation. (3 cr) Conducted in English.*

ITA 2142 Italian Civilization Study of Italian culture in its manifold aspects. (3 cr)

ITA 2211 Readings in Italian Literature Readings in fiction, verse and drama representing various literary currents and personalities from the Renaissance to modern times. (3 cr)

ITA 2215 Italy Through the Sociological Film A culturally-oriented course using the film medium to explore various aspects of Italian society from the aftermath of World War II to the present. (3 cr)

ITA 3411 Petrarca and Boccaccio The major works of Francesco Petrarca and Giovanni Boccaccio. **(3 cr)** *Prereqs: ITA 1131 and 1132 or the equivalent.*

ITA 3412 Special Topics Topics of special interest in Italian literature. Topics to be arranged. Course may be repeated for credit. **(3 cr)**

ITA 3421 Dante's Divine Comedy Dante's masterpiece with special emphasis on the "Inferno". **(3 cr)** *Prereqs: ITA 1131, 1132 or the equivalent.*

ITA 3512 The Renaissance Selected authors who played a major role in the development of humanistic viewpoint and in the creative achievements of the Renaissance. **(3 cr)** *Prereqs: ITA 1131, 1132 or the equivalent.*

Courses in English

ITA 4110 Dante's Divine Comedy Dante's masterpiece in the context of the medieval vision of man and his destiny. **(3 cr)** *Conducted in English.**

ITA 4120 Boccaccio The *Decameron* as an expression of the individual's struggle to emerge from the collectivity of medieval society and of Boccaccio's fascination with the infinite resources of human intelligence. **(3 cr)** *Conducted in English.**

ITA 4130 Italian Culture The land and people of Italy; their social and cultural evolution; their achievements in the arts and their influence on art, literature and music; their contribution to the history of ideas. **(3 cr)** *Conducted in English.**

ITA 4140 The Image of Woman in Italian Literature Literary works from the Medieval period to modern times. The role of the woman in Italian culture through the eyes of such literary geniuses as Dante, Petrarch and Boccaccio. Fulfills Diversity and Women's Studies requirements. **(3 cr)** *Conducted in English.**

ITA 4150 ITA Italian Art and Literature Italian literature as reflected in painting, sculpture and architecture. Course is offered as part of the Villanova summer program in Urbino, Italy. **(3 cr)**

JAPANESE

Introductory Japanese I and II will fulfill the core requirement for a foreign language.

JPN 1111, 1112 Intensive Basic Japanese I and II Functional use of Japanese for students with no prior knowledge of Japanese. Oral and aural communication skills, reading and writing skills. Supplementary practice with computer. **(12 cr)** *Six hours a week. Sem 1&2.*

JPN 1121, 1122 Intermediate Japanese I and II Further practice of oral and aural communication skills, reading and writing skills. Supplementary practice with computer. **(10 cr)** *Five hours a week. Sem 1&2.*

JPN 1131, 1132 Advanced Japanese I and II Advanced practice of communication skills - oral speech and discussion skills, reading and writing skills. Supplementary practice with computer. **(6 cr)** *Three hours a week. Sem 1&2.*

JPN 2100 Japanese Literature in English Translation The Masterpieces (including Nobel Prize Winning work) of 20th century Japanese Literature (novels, short stories, drama, poems, women writers). Writing enriched. Fulfills cultural diversity requirement. **(3 cr)** *Conducted in English.**

JPN 2142 Japanese Culture and Civilization Various aspects of Japanese culture, society and people from the beginning to the present. Writing enriched. Fulfills cultural diversity requirement. **(3 cr)** *Conducted in English.**

JPN 3412 Special Topics Topics of special interest in Japanese society, culture, language (cross-cultural communication, business Japanese), and literature. Topics to be arranged. Course may be repeated for credit. **(3 cr)**

MODERN LANGUAGES

ML 3200 Special Studies Studies in one of the areas not included in the languages, literatures and civilizations usually offered, e.g., Polish, Romanian and Ukrainian; readings and discussions. **(3 cr)***

ML 3201 Introduction to Language The definition and structure of language; also presents an analysis

of the issues and terminologies related to the study, acquisition and learning of language. **(3 cr)**

RUSSIAN

Introductory Russian I and II will fulfill the core requirement for a foreign language.

RUS 1111, 1112 Introductory Russian I and II

Functional use of Russian for students with no prior knowledge of Russian. Recitations, readings and oral drills. Supplementary language laboratory work. Satisfies Arts and Sciences Language requirement. **(12 cr)** *Six hours a week. Sem 1&2.*

RUS 1121, 1122 Intermediate Russian I and II

Review of grammar and vocabulary. Recitations, readings and oral drills. Supplementary language laboratory work. **(10 cr)** *Five hours a week. Sem 1&2. Prereqs: RUS 1111 and 1112 or the equivalent.*

RUS 1131 Conversation and Composition I

Advanced communication skills including reading and discussing topics on current events. Supplementary language laboratory work. **(3 cr)** *Prereqs: RUS 1121 and 1122 or the equivalent. Writing Enriched.*

RUS 1132 Conversation and Composition II A continuation of RUS 1131. **(3 cr)** *Writing Enriched.*

RUS 3412 Special Topics Special interest topics in language, literature and culture. Course may be repeated for credit. **(3 cr)** *Writing Enriched.*

Courses in English

RUS 4110 Russian Civilization Understanding of Russian life and culture today by focusing on basic historical, ideological, economic, religious and cultural developments. Each student chooses one aspect of social development for further research. **(3 cr)** *Conducted in English.* Writing Enriched.*

RUS 4120 The Russian Short Story

Representative Russian short stories from Pushkin to Pasternak. **(3 cr)** *Conducted in English.* Writing enriched.*

RUS 4130 The Russian Novel I Major Russian novels of the 19th century, including Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky and

Tolstoy. **(3 cr)** *Conducted in English.* Writing Enriched.*

RUS 4140 The Russian Novel II Major Russian novels of the 20th century including Bely, Fedin, Olesha, Bulgakov, Sholokhov, Pasternak and Solzhenitsyn. **(3 cr)** *Conducted in English.* Writing Enriched.*

RUS 4150 The Russian Drama The evolution of Russian drama from the 19th century to the present. **(3 cr)** *Conducted in English.* Writing Enriched.*

SPANISH

SPA 1111, 1112 Introductory Spanish I and II

Groundwork Spanish, including oral proficiency, aural comprehension, and reading; for students with no prior knowledge of Spanish. Supplementary language laboratory work and oral drills. **(8 cr)** *Four hours a week. Sem 1&2.**

SPA 1121, 1122 Intermediate Spanish I and II

Review of grammar, composition, reading and conversation. **(6 cr)** *Three hours a week. Sem 1&2. Prereqs: SPA 1111 and 1112, 2-3 years of high school Spanish, or the equivalent.*

SPA 1131 Conversation and Composition I and II

Intense practice in conversation and composition with emphasis on developing advanced language skills in Spanish. Course conducted in Spanish. Writing enriched. **(3 cr)** *Prereq: SPA 1121, 1122, 4-5 years of high school Spanish or the equivalent.*

SPA 1133 Business Spanish I Credit documents, contracts, business correspondence, and abundant practice in letter writing. **(3 cr)** *Prereqs: SPA 1121 and 1122 or permission of the chair.*

SPA 1134 Business Spanish II Corporations, their organization and function, mortgages, insurance, and taxes. **(3 cr)** *Prereqs: SPA 1121 and 1122 or permission of the chair.*

SPA 1136 Translation Skills An introduction to the theory and practice of translation. **(3 cr)** *Prereqs: SPA 1132 and 1133 or the equivalent.*

SPA 1137 Spanish for the Health Professions Medical terminology and idioms with emphasis on

communicative competence. (3 cr) *Prereq: SPA 1132 or permission of the chair.*

SPA 1138 Advanced Grammar Intensive grammar review with special attention to literary style. (3 cr) *Prereq: SPA 1132 or permission of the chair.*

SPA 2142 Spanish Civilization The civilization and culture of Spain. (3 cr) *Prereq: SPA 1132 or permission of the chair.*

SPA 2143 Spanish-American Civilization Spanish-American civilization and culture in its manifold aspects. (3 cr) *Prereqs: SPA 1121 and 1122.*

SPA 2211 Survey of Peninsular Literature The foremost works of Spanish literature from the beginnings to present day. A required course for majors. (3 cr) *Prereq: SPA 1132 or permission of the chair.*

SPA 2212 Survey of Spanish-American Literature Spanish-American literature from colonial times to the present. A required course for majors. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 2213 Spanish-American Theatre The modern theatre in Spanish America from the turn of the century to the present. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 2214 Spanish-American Novel Reading and interpretation of Spanish-American novels from the modernist period to the present. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 2215 Spanish-American Short Story The origins, development and maturity of the short story in Spanish America. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 2216 History of the Spanish Language Spanish from its origins to the present. (3 cr) *Prereq: SPA 1132 or permission of the chair.*

SPA 2217 Hispanic Literature Through Art Main trends and styles of Spanish and Spanish-American literature analyzed in the light of corresponding trends and styles in the visual arts. From Gonzalo de

Berceo to Pablo Neruda. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 3411 Masterpieces of Medieval Literature The *Cid* and other major works of the Spanish Middle Ages: early lyric, epic, ballad, prose. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 3412 Special Topics Advanced study of topics of special interest in Spanish literature. Topics may be repeated for credit. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 3612 Cervantes An interdisciplinary approach to Cervantes's work. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 3613 Prose of the Renaissance and the Golden Age 16th and 17th century prose and its cultural and ideological context. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 3614 Drama of the Golden Age The representation of the monarch, women, minority groups, etc. in Golden Age society through its drama. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 3715 Eighteenth-Century Literature Prose, poetry and theatre from Feijoo to Moratín. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 3717 Nineteenth-Century Drama A critical analysis of representative plays. (3 cr) *Prereq: SPA 1132 or permission of the chair.*

SPA 3718 Nineteenth-Century Novel Reading of novels representing *costumbrismo*, *realismo* and *naturalismo*. (3 cr) *Prereq: SPA 1132 or permission of the chair.*

SPA 3820 Spanish Lyric Poetry I Spanish lyric poetry concentrating on early modern romanticism and modernism. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 3821 Spanish Lyric Poetry II Contemporary Spanish lyric poetry. (3 cr) *Prereq: SPA 1132 or the equivalent.*

SPA 3822 Spanish-American Poetry The

development of Spanish-American poetry from colonial times to the present. **(3 cr)** *Prereq: SPA 1132 or the equivalent.*

SPA 3920 Contemporary Spanish Short Fiction Short fiction in the Spanish literary tradition, with greater emphasis on the fruition of the genre in contemporary Spain. **(3 cr)** *Prereq: SPA 1132 or permission of the department chair.*

SPA 3921 Contemporary Spanish Drama Reading and analysis of representative plays from Benavente to the present day. **(3 cr)** *Prereq: SPA 1132 or permission of the chair.*

SPA 3923 The Modern Novel Representative trends in 20th century Spanish novels. **(3 cr)** *Prereq: SPA 1132 or the equivalent.*

SPA 3924 Spanish Films and Literature Spanish films based on literary works as a medium will be used to better understand contemporary Spanish culture and civilization. Writing Intensive. **(3 cr)**

SPA 3950 Research Methodology Principles and techniques of literary research. Overview of major Spanish and Spanish-American authors and representative works. Writing intensive. Required for Spanish majors. **(3 cr)** *Prereq: SPA 1132 or the*

equivalent.

COURSES IN ENGLISH

SPA 4100 Spanish Literature in English Translation Major works of Spanish literature in translation. **(3 cr)** *Conducted in English.**

SPA 4110 The Spanish Epic and Ballad Readings and discussions in the popular literature, including the folktale. **(3 cr)** *Conducted in English.**

SPA 4120 Don Juan The mythic don, his ancestors and descendants in Spanish literature, from Juan Ruiz to the present. **(3 cr)** *Conducted in English.**

SPA 4130 The Modern Spanish Novel The Spanish Civil War reflected in selected contemporary novels. **(3 cr)** *Conducted in English.**

SPA 4140 The Latin American "Boom" The contemporary novel and short story: Borges, Cartázar, Asturias, Fuentes, Machado de Assis, Rulfo, García Márquez. **(3 cr)** *Conducted in English.**

SPA 4150 The Arab-Andalusian Legacy The historical, cultural and literary impact of the Arab period in Spain. *Conducted in English.* **(3 cr)**

NAVAL SCIENCE

Chair and Professor: Pugh

Associate Professor: Shaffer

Instructors: Fondren, Hyde, Monagle Wall, Zurcher,

Office: 103 John Barry, tel. 519-7380

Eligibility for a commission in the U.S. Navy or the U.S. Marine Corps through the NROTC Program is contingent upon successful completion of required University and naval professional courses of study. Courses required by the NROTC program are as follows:

1. Navy Option: NS 0100, 1000, 1100, 2100, 2200 3100 3200, 4100, 4200 plus six credits each of calculus (completed by end of Sophomore year), physics (completed by the end of Junior year), and English. Also three credits computer Science, and three credits of American military affairs. All courses must be approved by the Naval Science Advisor.

2. Marine Option: NS 0100, 1000, 1100, 3500, 3600, 4100, 4200 and three credits of American military affairs, approved by the Marine Option Advisor.

3. Nurse Option: NS 0100, 1000, 1100, 4100, 4200, and six credits of English, approved by Naval Science Advisor.

MINOR: (Navy Option) NS 0100, 1000, 1100, 2100, 2200, 3100, 3200, 4100, 4200. (Marine Option) NS 0100, 1000, 1100, 3500, 3600, 4100, 4200.

NS 0100 Naval Professional Laboratories Military drill, information briefings, and seminars on various subjects of USN/USMC interest including naval orientation (freshman), naval warfare specialties (sophomores), navigation laboratory (juniors), career planning and pre-commissioning information (seniors). **(0 cr)** *Two hours a week. Sem I&2.*

NS 1000 Introduction to Naval Science

Course is an introduction to the naval profession and to the concepts of seapower. The mission, organization, and warfare components of the Navy and Marine Corps, including an overview of officer and enlisted ranks, rates, and career patterns; naval courtesy and customs, military justice, leadership, and nomenclature are discussed. Normally taken by freshmen. **(2 cr)** *Sem 1.*

NS 1100 Seapower and Maritime Affairs

Naval history from the beginnings of the age of sail through the twentieth century. The works and influence of Alfred Thayer Mahan as they relate to current and past fleet doctrine. The impact of foreign nations' maritime activities on world seapower.

Normally taken by freshmen. This course is writing enriched. **(3 cr)** *Sem 2.*

NS 2100 Naval Ships System I Construction and propulsion of naval ships, including design, stability, control of damage. Propulsion systems including steam, diesel, gas turbine, and nuclear power plants; shipboard electrical power generation and distribution; and shipboard auxiliary systems including refrigeration, fresh water distilling plants and air compressors. Normally taken by sophomores. **(3 cr)** *Sem 2.*

NS 2200 Naval Ships Systems II Naval weapons systems including radar, sonar, and gyroscopes; weapons systems analysis stressing the fire control problem, information flow, the servo principle, and use of computers; general operation, safety and maintenance of shipboard weapons systems. Normally taken by seniors. **(3 cr)** *Sem 1.*

NS 3100 Navigation The theory and technique of piloting and celestial navigation. Normally taken by juniors. **(3 cr)** *Sem 1.*

NS 3200 Naval Operations The maneuvering board, tactical communications, rules of the road, and seamanship. Normally taken by juniors. **(3 cr)** *Sem 2.*

NS 3500 Evolution of Warfare The evolution of weapons, tactics, and military organization applicable to land operations; the classic principles and variables of land operations. **(3 cr)** *Sem 1.*

NS 3600 Amphibious Operations The study of significant events in history relating to amphibious operations with particular attention on their impact on the evolution of amphibious warfare doctrine. **(3 cr)** *Sem 1.*

NS 4100 Leadership and Management
Fundamentals of leadership and management of an

organization; emphasis on the Naval officer as leader and manager, concentrating on areas such as professional ethics, organizational theory, and the characteristics and roles of successful leaders. Normally taken by sophomores. **(3 cr)** *Sem 1.*

NS 4200 Leadership and Ethics Application of the principles of leadership and management to the Navy and Marine Corps; exploration of the problems of race relations, drug and alcohol abuse, and human resource development. The organizational process, professional ethics, moral responsibilities of leadership, and the military justice system. Normally taken by seniors. **(3 cr)** *Sem 2.*

PEACE AND JUSTICE

Director: DeFina

Office: Ground Floor, Sullivan, tel. 519-4499

CONCENTRATION: Twenty-four 24 credit hours, including all requirements for the minor plus two additional courses from Peace and Justice seminar categories, or from courses cross-listed as Peace and Justice courses.

MINOR: Eighteen credit hours, including either PJ 1100 or 5300; at least three courses from at least two different Peace and Justice seminar categories (2000, 3000, 4000, 5000); and two courses from the remaining Peace and Justice seminars or from those courses cross-listed as Peace and Justice courses.

PJ 1100 Introduction to Peace and Justice
Definitions and understandings of concepts such as peace, justice, racism, sexism, and classism. Critical reflection on the systematic nature of justice and injustice; strategies and techniques for effective social change. **(3 cr)** *Sem 1.*

PJ 2000 Selected Topics Application of Catholic Social Teaching and the Pastorals of the American Catholic Bishops to issues of systemic justice, social analysis, and political economy. **(3 cr)**

PJ 2100 Ecofeminism Women's studies perspectives on environmental thought. The role of

ecofeminist thought in the development of a 'post-modern' societal paradigm and in a radical reconsideration of destructive and unquestioned beliefs concerning justice, peace, and community. **(3 cr)** *Sem 1&2.*

PJ 2200 Caring for the Earth The richness and diversity of Planet Earth, especially in its species forms; current forms of degradation to land, water, soil, and air and human inhabitants; economic, political, religious, cultural and social causes of global environmental problems; personal and ethical/social justice decisions necessary to care for the Earth. **(3 cr)** *Sem 2.*

PJ 2300 Literacy and Social Justice Theories of literacy and literacy training. Literacy tutoring in poor and marginalized communities. (3 cr) *Sem 2.*

PJ 2400 Service & Education for Justice Economic, political, cultural, and spiritual root causes of the problems students observe in service projects. Development of a deeper appreciation and respect for the poor and a more long-lasting commitment to their struggle for justice. (3 cr) *By permission of instructor only. Sem 1.*

PJ 2500 Education and Social Justice American education's contribution to class, gender, and "race" inequality: political bias in school curricula; unequal treatment of students by teachers and administrators based on "race," ethnicity, class, and gender; unequal allocation of resources among public schools; the public-private school debate; possible political influences in universities; the mass media as an important component of education. (3 cr) *Sem 1.*

PJ 2600 Catholic Social Teaching One hundred years of Catholic Social Thought. Papal encyclicals, especially *Rerum Novarum* (1891) and *Sollicitudo rei Socialis* (1987). The pastoral letters of the American Bishops, special emphasis on *The Challenge of Peace* (1983) and *Economic Justice for All*. Guest lecturers will help to show the interdisciplinary nature of Catholic teaching. (3 cr) *Sem 1.*

PJ 3000 Selected Topics Violence in families and society, the traditions of Just War theory, and the critiques of war from the perspective of pacifism and non-violence. The importance and role of the peacemakers of the world, the values of conflict resolution, and strategies that aid the creation of a peaceful world order. (3 cr)

PJ 3100 American Indian Thought & Culture Historical, philosophical, religious, literary and artistic contributions of the Navajo, Sioux, Iroquois, and Hopi cultures. American Indian Art and Poetry, American Indian colonial history, American Indian tribal claims, and American Indian spirituality of the earth. Guest speakers and films. (3 cr) *Sem 1.*

PJ 3200 Justice and Sports The benefits and

problems of competition. The role and value of competition in contemporary sports, with attendant social justice issues. The importance of play to a wholistic human life. (3 cr) *Sem 2.*

PJ 3300 Modern Peacemakers The life, times, writings, and influence of Mohandas Gandhi, Dorothy Day, Thomas Merton, and Martin Luther King, Jr., emphasizing their nonviolent protests against modern forces of racism, militarism and economic exploitation. Guest lecturers. (3 cr) *Sem 1.*

PJ 3400 War and Morality Three traditions of moral reflection on war: "Just War" Theory; Pacifism; and, the historical experience of women. Discussions focus on concrete cases (e.g., the modern world wars, Vietnam, the Persian Gulf War, Bosnia). (3 cr) *Sem 2.*

PJ 3500 Making Peace Work Various theories of peace; describing, explaining, and predicting the occurrence of peace; conflict, peace-making, -keeping, -building. Computer simulations of the peace process. (3 cr) *Sem 1.*

PJ 4000 Selected Topics The history of the struggle for justice and human rights in geographical locations, such as the Middle East, Ireland, Africa, and Central America, focusing on such issues as world hunger and apartheid, and culminating in an attempt to articulate systemic questions of justice. (3 cr)

PJ 5000 Selected Topics Justice and discrimination in U.S. society from social, economic, political and ethical perspectives. Strategies for the just elimination of discrimination. Topics include civil rights, gender issues of justice, etc. (3 cr)

PJ 5100 Discrimination, Justice & Law Development of discrimination and civil rights law in the United States through case materials in areas of racial discrimination, gender-based discrimination, reverse discrimination, sexual preference-based discrimination, and age discrimination, if time permits. (3 cr) *Sem 1.*

PJ 5200 Poverty and the American Economy An interdisciplinary perspective on poverty in the

United States, emphasizing the past thirty years. Trends in the extent and incidence of poverty. Underlying causes of poverty; policies that might be used to combat poverty. **(3 cr)** *Sem 1.*

PJ 5300 Race, Class and Gender An integrated and interdisciplinary approach to such questions as: Why are women disproportionately poor in American society? Is equality of opportunity a reality or a myth? What are the continuing effects of racial discrimination in areas of education, housing, and employment? Special attention to the way in which considerations of race, class, and gender reinforce one another and together impede the realization of justice and the common good. **(3 cr)** *Sem 2.*

PJ 5400 Ethics, Justice and the Family The moral meaning of marriage; justice, gender, and the domestic division of labor; the legal protection of marriage and the parties to it; marriage, reproductive technology, and the commodification of children; the moral meaning of “having children”; the responsibilities of parents to their children; the responsibilities of children to their parents, with special reference to care for the aged; distributive justice and the family; a society’s responsibilities to serving the needs of its children. Course readings will be taken from a number of disciplines, including Christian ethics, law and legal history, philosophy, and sociology. **(3 cr)** *Sem 1.*

PJ 5500 Race and Racism in American Film The depiction of African Americans, Latinos, Native Americans, Asian Americans, and Jews in American films from sociological and textual approaches. Attention to producers, directors, and audiences. Film as a cultural document. **(3 cr)** *Sem 1.*

PJ 5600 Independent Study **(3 cr)**
Sem 1&2

PJ 5700 The Meanings of Justice Libertarian, socialist, welfare liberal, communitarian, feminist, and multicultural approaches to justice in contemporary literature. Consideration of recent studies of social justice in Christian ethics. **(3 cr)**
Sem 1

PJ 5800 International Perspectives on Poverty Characteristics of the poor; international differences and compositions of poverty; economic explanations of poverty in alternative systems; poverty and sustainable development; institutional responses to poverty; Catholic Social Teaching and poverty. **(3 cr)** *Sem 1.*

Elective courses which receive Peace and Justice credit: ARB 2142; ECO 3127, 3141, 4207; GEO 2000, 2100, 2200, 2300; HIS 2990, 4490, 4620; PHI 2115, 2140, 2150, 2400, 3500, 3820; PSC 2100, 2700, 3500, 4401, 5600, 6130, 6325; SOC 3500, 3600, 5200; THL 3100, 3500, 4200, 4300, 4600; and selected Honors Program courses.

PHILOSOPHY

Chair and Associate Professor: McCartney

Professors: Betz, Brogan, Burt, Busch, Caputo, Doody, Fielder,
Immerwahr, Schmidt, Slattery

Associate Professors: Carvalho, Goff, Losoncy, Wall

Assistant Professors: Brakman, Miles, Regan, Scholz

Office: 108 St. Augustine Hall, tel. 519-4690

MAJOR: In order to graduate as a Philosophy major, the student must take PHI 1050 and must satisfy the college-wide ethics requirement (Eth. 2050). The student must take an additional 30 credits in Philosophy including PHI 3010 (**taken in Junior Year**), PHI 2500, PHI 2510, PHI 2520 and PHI 6000 (**taken in Senior Year**). A student with majors in Philosophy and another discipline may, with the approval of the Chair of the Philosophy Department, count up to six cognate related credits from the second major toward fulfilling the Philosophy major requirements.

MINOR: In order to graduate as a Philosophy minor, the student must take fifteen credit hours in Philosophy, this number to include credits taken to satisfy the collegiate core requirements. At least nine credits must be taken from courses other than 1050, 1500, 1600, 2115 and 2150.

PHI 1050 Introduction to Philosophy The issues of God, persons and nature, and knowledge. Readings include sources which give special consideration to the classical and Christian perspectives. (3 cr)

PHI 1500 Logic Inductive and deductive arguments; informal fallacies, truth and validity, deductive systems, syllogistic logic, the propositional calculus, inductive methods of reasoning. (3 cr)

PHI 1600 Business and Society The role of government in business, consumer demands, corporate social responsibility. Particular emphasis placed on social justice and individual ethics. (3 cr)

PHI 2115 Ethics for Health Care Professionals Rights and duties of the patient/client and the members of the health care team, death and dying, genetic engineering and manipulation. (3 cr)

PHI 2120 Medical Ethics An application of moral functions to the medical profession; the problems of euthanasia, abortion, genetic engineering, and the use of drugs. (3 cr)

PHI 2125 Philosophy of Death and Dying Theories and conceptions of human suffering, death and life; issues of suicide, bereavement, grief and euthanasia. (3 cr)

PHI 2130 Business Ethics Social justice and charity as principles of order in economic life and relationships: topics include consumer rights, corporate social responsibility, and ecology. (3 cr)

PHI 2140 Philosophy of Criminal Justice Philosophical dimensions of criminal justice; law and morality, criminal versus civil disobedience, philosophical presuppositions of the insanity defense, philosophical problems in controlling and correcting criminal and delinquent behavior. (3 cr)

PHI 2150 Engineering Ethics Whistle-blowing, conflicts of interest, political contributions, and the social responsibility of engineers. (3 cr)

PHI 2160 Philosophy of Biology Key assumptions of the contemporary biological sciences: the meaning of life, the relevance of science, the structure of the life sciences, the “doctrine” of DNA and molecular genetics, evolutionary theory, ecology and the “Gaia” hypotheses, and the ethical and social issues spawned by new advances in biology and molecular genetics.

PHI 2170 Ethical and Social Issues in Mass Media The impact of the changing communications technologies on the human person and society; freedom of the press, violence; pornography and

ensorship, confidentiality of sources, advertising ethics and codes of ethics and standards of practice. (3 cr)

PHI 2180 Ethical Issues in Computer Science Codes of professional ethics, unauthorized access, ownership of software, and the social responsibility of computer professionals. (3 cr)

PHI 2200 Philosophy and Film Analysis of selected classics and current films from the perspective of basic philosophical concepts and questions. (3 cr)

PHI 2400 Social and Political Philosophy Social and political philosophers and the influence of their theories on the philosophical foundation of modern culture and society; emphasis on such conceptions as society, the state, justice and equality, and the social and political nature of persons. (3 cr)

PHI 2410 The Ethics of War Just war theory, total war, nuclear deterrence and nuclear war, disarmament, genocide, war crimes and atrocities, terrorism, non-violent resistance, and pacifism. (3 cr)

PHI 2425 Philosophy of Women Nature and status of woman from ancient times to the present, with consideration of the more general context of self-identity; contemporary feminist theories; feminism as a political movement. (3 cr)

PHI 2430 Eco-feminism Basic positions in eco-feminism as they relate to the philosophical and religious traditions of the West. (3 cr)

PHI 2500 History of Ancient Philosophy Plato, Aristotle and selected pre-Socratic and Hellenistic philosophers in the context of ancient and classical Greek civilization. (3 cr)

PHI 2510 History of Medieval Philosophy Philosophical movements from the early Middle Ages to the rise of modern philosophy; the influence of later Medieval speculation upon thinkers of the modern period; readings from Augustine, Aquinas, Bonaventure, and others. (3 cr)

PHI 2520 History of Modern Philosophy The

systems of Descartes, Spinoza, Leibniz, and the empiricists - Locke, Berkeley, and Hume; Kant; selections read and evaluated. (3 cr)

PHI 2800 American Philosophy The growth of philosophy in America, concentrating on the thinkers of the classical period, especially Peirce, James, Royce, Dewey, and Santayana. (3 cr)

PHI 2950 Topics in Philosophy Special topic in philosophy of current interest to faculty and students. (3 cr)

PHI 2993 Internship Departmentally related and academically creditable field work experience. See department chair for more information. (3 cr)

PHI 2996 Internship Departmentally related and academically creditable field work experience. See department chair for more information. (3 cr)

PHI 3000 Plato and Aristotle Selected texts and themes from Plato and Aristotle. (3 cr)

PHI 3010 Majors Seminar: Approaches and Methods Preparation for advanced work in philosophy by exploring a representative variety of approaches and methods characteristic of the discipline. (3 cr)

PHI 3100 An Introduction to Saint Augustine Life and thought of Saint Augustine; the problem of certitude, the problem of evil, the nature of history, human knowledge and God, the soul-body relations, and political philosophy. (3 cr)

PHI 3120 Augustine in Western Thought Influences of Augustine's major teachings in shaping medieval and modern thought. Augustine's position on human nature, human freedom, sin and grace, history, and the nature and end of society. (3 cr)

PHI 3130 Augustine and Existentialist Tradition Existential themes in Augustine and their influence on such thinkers as Luther, Kierkegaard, Heidegger, Marcel, Camus. (3 cr)

PHI 3160 History of Islamic Philosophy

Islamic thought, concentrating particularly on Islamic medieval theology and philosophy. (3 cr)

PHI 3200 Metaphysics Questions regarding the nature and possibility of metaphysics; selected texts from Greek philosophy to the present. (3 cr)

PHI 3400 Theories of Knowledge Nature and limits of human knowledge, kinds of knowledge, the nature of perception, subjectivity, belief, doubt, truth, and certitude. (3 cr)

PHI 3500 Freedom Human freedom analyzed from a metaphysical and political perspective; readings from classical and contemporary sources on such topics as determinism, slavery, rights, authority and dissent. (3 cr)

PHI 3525 Philosophy of Human Sexuality Embodiment, the nature of sexuality, the types of love, sexual ethics, marriage, sexual differences, and sexual discrimination. (3 cr)

PHI 3600 Philosophy of Art The principles and causes of beauty and art with special reference to the formation of art objects and the cultural context of philosophy and art. (3 cr)

PHI 3620 Philosophy and Literature Philosophical ideas in selected literary works; examination of the relation of literature to philosophy; fiction and truth, modes of communication. (3 cr)

PHI 3650 Philosophy of Law The nature and function of law, relation of law to ethics, the judicial process, the role of constitutions, the rights of citizens, law and international relations. (3 cr)

PHI 3700 Philosophy of History Theories concerning the nature of history, the idea of progress, historical inevitability, the role of the "great man." (3 cr)

PHI 3720 Marxism Marx on the theories of human nature, freedom and history; related developments in Marxist thought. (3 cr)

PHI 3750 Mysticism and Philosophy The metaphysical interpretation of God, humans and the world implicit in the writings of selected mystics;

epistemological issues such as mysticism and logic, the value of mystical experience, mysticism and psychedelic experience, mysticism and ethics. (3 cr)

PHI 3820 Environmental Ethics The relation of the physical and biological environment to ethical values. Priorities among environmental, economic and political values as a basis for ethical decisions. (3 cr)

PHI 3825 Technology and Society Case studies of specific technologies (such as television, automobiles, health technology) and critical examination of ethical, philosophical and policy issues that these technologies raise. (3 cr)

PHI 3850 Philosophy of Sport Nature of play, sport and game with special emphasis on the role of sport in modern society. (3 cr)

PHI 4000 Philosophy of Social Science The relation of social and natural science, behaviorism, models of explanation, moral and valuational implications of social science. (3 cr)

PHI 4050 Philosophy of Natural Science Philosophical implications of specific laws and theories; Newton's laws, energy, evolution, relativity, atomic theory. Methodological problems of observation, discovery, testing; scientific realism, revolutions in scientific thought. (3 cr)

PHI 4200 Philosophy of Language Major classical and contemporary philosophical theories concerning language, including the relationship of language to thought, experience and reality; theories of meaning, communication, linguistics, translation, poetic and religious language. (3 cr)

PHI 4300 Contemporary Anglo-American Philosophy Major themes and trends in analytic philosophy: Russell, logical positivism, Wittgenstein and present day linguistic philosophy. (3 cr)

PHI 4500 Asian Philosophies Sources of Eastern philosophies. Aspects of philosophies such as: Hinduism; Buddhism; Confucianism; Janism; Sufism. (3 cr)

PHI 4600 Introduction to St. Thomas Aquinas

Historical influences in the formation of St. Thomas' thought; specific contributions of Aristotelianism and Neoplatonism; theory of knowledge, being; persons and morality. (3 cr)

PHI 4610 Freud and Philosophy Philosophical implications of Freudian theory as it relates to the individual and culture; the role of the unconscious; interpretation, structure of the ego, human sexuality and the foundations of civilization. (3 cr)

PHI 4800 French Existentialism and Phenomenology The development of phenomenology and existentialism in post-war France; the challenge to this thought by structuralism. Sartre, Marcel, Camus, Merleau-Ponty, Ricoeur, Levinas. (3 cr)

PHI 4850 German Existentialism and Phenomenology Individual and mass society,

freedom, our consciousness of the world, and death in the writings of Kierkegaard, Nietzsche, Husserl and Heidegger. (3 cr)

PHI 4875 Hermeneutics Problem of interpretation; the possibility of a presuppositionless interpretation, interpretation, pre-understanding and the hermeneutic circle, historical, literary, scriptural and artistic interpretation. (3 cr)

PHI 4975 Independent Study and Research Topic chosen by the student and approved by the professor and the chair. (3 cr)

PHI 6000 Research Seminar Inquiry in depth into one major philosophical problem or into the thought of one major philosopher; practice in the use of research and bibliographical techniques. (3 cr)

PHYSICS

Chair and Professor: Maurone

Professors: Hones, Phares

Associate Professors: Shaw, Wunderlich

Assistant Professors: Arrison, Besson, Guim, Schick, Siah, Strieb, Vassiliou, Zamani

Office: 352 Mendel, tel. 519-4860

MAJOR: PHY 2410/2411, 2412/2413, 2414/2415, 2416/2417, 2601/2603, 3310/3311, 4000/4001, 4002/4003, 4100/4102, 4200/4202, 5100, 5200, 5300; CHM 1103, 1151/1152; MAT 1500, 1505, 2500, 2705. In addition, Physics majors must select a minimum of one elective from the Physics departmental offerings and three science courses chosen from courses for Science, Mathematics or Computer Science Majors.

MINOR: Successful completion of an introductory sequence in Physics, plus a minimum of 15 credits from the upper level Physics courses numbered above 2417. Physics minors are open to all science and engineering students.

PHY 1010 Conservation Laws and Their Modern Applications Kinematics; Newton's laws of motion and universal law of gravitation; rotational dynamics; hydrostatics and hydrodynamics. Linear momentum, energy and angular momentum conservation: collisions, space travel, satellite and planetary motion, static equilibrium and the mechanics of the human body. (3 cr) *Sem 1.*
Prereq: High school Algebra, Trigonometry and Geometry, or two semesters Mathematics. *Coreq:* PHY 1011.

PHY 1011 Physics Laboratory I Elements of q-basic programming with applications to data analysis; mechanics experiments exhibiting conservation laws and testing Newton's laws of motion and universal law of gravitation. (1 cr)
Sem 1. Two hours laboratory a week. Coreq: PHY 1010.

PHY 1012 Energy and Modern Technologies Thermodynamics: heat pumps, refrigerators and car

engines. Electricity and magnetism: energy conversion and electric power generators, electromagnetic waves (radio, TV, telecommunication). Applications of Einstein's special theory of relativity, Planck's quantization, deBroglie's wave-particle duality, Heisenberg's uncertainties and Pauli's exclusion principle include: twin paradox, photoelectric effect and solar cells, atomic energy levels, periodic table of elements, chemical bonding, fission and fusion energy, radioactivity. **(3 cr) Sem 2. Prereq: PHY 1010 and 1011. Coreq: PHY 1013.**

PHY 1013 Physics Laboratory II Heat, electromagnetism, and modern physics experiments. **(1 cr) Sem 2. Prereq: PHY 1010 and 1011. Coreq: PHY 1012.**

PHY 1020 Great Ideas In Physics, Aristotle To Einstein I General physics at a primarily conceptual level (algebra only). History and Philosophy of science, especially physics and astronomy. Topics include mechanics, optics, and relativity. Personalities include Aristotle, Galileo, Newton, and Einstein. **(3 cr) Sem 1.**

PHY 1021 Great Ideas In Physics Lab I Experiments designed to complement the topics in PHY 1020. **(1 cr) Sem 1. Coreq: PHY 1020, or consent of chair. Two hours laboratory a week.**

PHY 1022 Great Ideas In Physics, Aristotle To Einstein II A continuation of Great Ideas In Physics I. Thermodynamics, earth science, electricity and magnetism, and modern theories of physics. Personalities include Joule, Maxwell, Faraday, Bohr, and Feynman. **(3 cr) Sem 2. Prereq: PHY 1020, 1021, or consent of chair.**

PHY 1023 Great Ideas In Physics Lab II Experiments designed to complement the topics in PHY 1022. **(1 cr) Sem 2. Prereq: PHY 1020, 1021, or consent of chair. Coreq: PHY 1022.**

PHY 1100 General Physics I Mechanics, heat and sound. **(3 cr) Sem 1. Prereq/coreq: MAT 1310, 1320, or 1330. Coreq: PHY 1101.**

PHY 1101 General Physics I Laboratory Selected experiments in mechanics, heat and sound.

(1 cr) Sem 1. Coreq: PHY 1100.

PHY 1102 General Physics II A continuation of PHY 1100; light, electricity and modern physics. **(3 cr) Sem 2. Prereq: PHY 1100. Pre/coreq: MAT 1315, 1325, or 1335. Coreq: PHY 1103.**

PHY 1103 General Physics II Laboratory Selected experiments in light and electricity. **(1 cr) Sem 2. Prereq: PHY 1101; Coreq: PHY 1102.**

PHY 1500 The Concept of Light Historical and analytical survey of the concept of light from classical to modern view points. Designed for the students in the College of Commerce and Finance. **(3 cr) Sem 1&2; Prereq: MAT 1320 & 1325, or MAT 1330 & 1335.**

PHY 2400 Physics I, Mechanics Introduction to Mechanics. **(3 cr) Sem 2. Prereq/coreq: MAT 1500.**

PHY 2402 Physics II, Electricity & Magnetism Electrostatics, DC Circuits, magnetism, and AC circuits. **(3 cr) Sem 1. Prereq: MAT 1505 and PHY 2400.**

PHY 2403 Physics Lab for Engineering Selected experiments illustrating the principles of Mechanics and Electricity and Magnetism. **(1 cr) Sem 1. Coreq: PHY 2402.**

PHY 2410 University Physics: Mechanics Vectors, kinematics, and dynamics of particles, rigid bodies, and fluids. **(3 cr) Sem 1. Coreq: MAT 1500.**

PHY 2411 Lab: Mechanics Selected experiments demonstrating the fundamental principles of Mechanics and Waves with emphasis on techniques of measurements and data analysis. **(1 cr) Sem 1. Coreq: MAT 1500 and PHY 2410**

PHY 2412 University Physics: Electricity & Magnetism Electrostatics, DC circuits, magnetism, and AC circuits. **(3 cr) Sem 2. Coreq: MAT 1505. Prereq: PHY 2410**

PHY 2413 Lab: Electricity & Magnetism **(1 cr) Sem 2. Coreq: PHY 2412**

PHY 2414 University Physics: Thermodynamics

Heat, kinetic theory of gases, first and second laws of thermodynamics, wave motion acoustics, geometrical and physical optics. **(3 cr)** *Sem 1.*
Prereq: PHY 2410. Coreq: MAT 2500.

PHY 2415 Lab: Thermodynamics Selected experiments in heat, waves and optics. **(1 cr)** *Sem 1.*
Coreq: PHY 2414

PHY 2416 Modern Physics Special theory of relativity, atomic theory, quantum physics, the Schrodinger equation, solid-state physics, nuclear physics, elementary particles and cosmology. **(3 cr)**
Sem 2. Prereq: PHY 2410, 2412 and 2414, or equivalent. Coreq: MAT 2500 or 2705 or equivalent.

PHY 2417 Lab: Modern Physics Interference; Franck Hertz experiment; Photoelectric effect; Michelson interferometry; Millikan oil drop experiment; Electron Spin Resonance (ESR); Ferroelectricity; Superconductivity; Low Temperature physics experiments. **(1 cr)** *Sem 2.*
Prereq/coreq: PHY 2416.

PHY 2601 Computational Physics Lab I Computer applications, data analysis and presentation, algorithms and programming, numerical methods, and basic graphics for physics and astronomy majors. **(1 cr)** *Sem 1. Coreq: Any introductory physics course.*

PHY 2603 Computational Physics Lab II Continuation of Computational Physics I. **(1 cr)**
Sem 2. Prereq: PHY 2601.

PHY 3310 Electronics DC and AC analysis including network theorems, power, resonance, filters, bridge circuits, amplifiers, integrated circuits, active devices, digital logic circuits and applications. **(3 cr)** *Sem 1. Coreq: PHY 3311.*

PHY 3311 Electronics Laboratory Laboratory experiments are chosen to supplement the Physics 3310 lectures and to give experience with sophisticated electronic equipment. **(1 cr)** *Sem 1.*
Coreq: PHY 3310.

PHY 4000 Electricity and Magnetism I Electrostatics, Coulomb's and Gauss' Laws,

Maxwell's first two equations, Laplace's equation and boundary value problems, dielectrics, currents in conductors. **(3 cr)** *Sem 1. Prereq: PHY 2414 and 4200, or consent of chair. Coreq: PHY 4001.*

PHY 4001 Electricity and Magnetism I Laboratory Selected experiments in the field. **(1 cr)** *Sem 1.*
Prereq: PHY 2414 and 4200, or consent of chair. Coreq: PHY 4000.

PHY 4002 Electricity and Magnetism II Magnetism, Biot-Savart's law, Faraday's law, Maxwell's third and fourth equations, electromagnetic wave equation, radiation. **(3 cr)**
Sem 2. Prereq: PHY 4000..

PHY 4003 Electricity and Magnetism II Laboratory Selected experiments in the field. **(1 cr)** *Sem 2.*
Prereq: PHY 4000 and 4001. Coreq: PHY 4002.

PHY 4100 Mechanics I Newtonian Mechanics, oscillations (simple, non-linear and driven), Lagrangian and Hamiltonian dynamics, central force motion and scattering, special theory of relativity. **(4 cr)** *Sem 1. Prereq: PHY 2414, or consent of chair.*

PHY 4102 Mechanics II Dynamics of rigid bodies, coupled oscillations, wave phenomena, fluid mechanics (steady and turbulent flow, the equations of Euler and Navier-Stokes). **(4 cr)** *Sem 2. Prereq: PHY 4100.*

PHY 4200 Mathematical Physics I Vector and tensor analysis, matrices and determinants, infinite series, functions of a complex variable. **(3 cr)**
Sem 2. Prereq: PHY 2414 and MAT 2505, or consent of chair.

PHY 4202 Mathematical Physics II A continuation of PHY 4200; second order differential equations, orthogonal functions, integral transforms, integral equations. **(3 cr)** *Sem 1. Prereq: PHY 4200.*

PHY 5000 Electronics Semiconductor diodes, transistors and integrated circuits; linear and nonlinear circuits, oscillation, logic circuits. **(3 cr)**
Coreq: PHY 5001.

PHY 5001 Electronics Laboratory Selected

experiments in the field. **(1 cr)** *Coreq: PHY 5000.*

PHY 5100 Quantum Mechanics Operators, Schrodinger Equation, one dimensional problems, harmonic oscillator, angular momentum, hydrogen atom, scattering theory. **(3 cr)** *Prereq: PHY 4000, 4100, 4200, and 4202, or consent of chair.*

PHY 5102 Quantum Mechanics II A continuation of Quantum Mechanics I. **(3 cr)** *Prereq: PHY 5100.*

PHY 5200 Thermodynamics/Statistical Mechanics Statistical methods, statistical thermodynamics, Ensembles, Partition functions. Quantum statistics. Kinetic theory of transport processes. **(4 cr)** *Sem 1. Prereq: Consent of chair required.*

PHY 5300 Nuclear Physics A Writing Intensive course. Lecture on structure of subatomic particles and nuclei, symmetries and Conservation laws, interactions and nuclear models, radioactivity and passage of radiation through matter. Lab covers accelerators, detectors and selected experiments in nuclear physics. **(4 cr)** *Sem 2. Prereq: Consent of Chair (course replaces PHY 5301)*

PHY 5500 Solid State Physics I Description of crystal structure, diffraction of X-rays, classification of solids, thermal properties of solids, dielectric properties, diamagnetism and paramagnetism, free electron theory of metals, band theory of solids. **(3 cr)** *Prereq: PHY 5100.*

PHY 5502 Solid State Physics II A continuation of PHY 5500. Brillouin zones. Band structure of solids. Semiconductor crystals, rectifiers and transistors. Ferromagnetism. Superconductivity. Applications. **(3 cr)** *Prereq: PHY 5500.*

PHY 5600 Advanced Electronics Three hours lecture a week. **(3 cr)**

PHY 5601 Advanced Electronics Laboratory **(1 cr)** *Coreq: PHY 5600.*

PHY 5701 Advanced Laboratory I Techniques and instrumentation of advanced experiments. **(3 cr)**

PHY 5703 Advanced Laboratory II A continuation

of PHY 5701. **(3 cr)** *Prereq: PHY 5701.*

PHY 5800 Advanced Mechanics Lagrange, Hamilton and Hamilton-Jacobi forms of mechanics. **(3 cr)**

PHY 5900 Advanced Quantum Mechanics Abstract formulation of quantum mechanics, perturbation and variational methods; applications to atomic and molecular structures. **(3 cr)**

PHY 6000 Advanced Optics Topics in geometrical and physical optics. **(3 cr)**

PHY 6001 Advanced Optics Laboratory **(1 cr)** *Coreq: PHY 6000.*

PHY 6100 Acoustics Transmission, reflection, refraction, absorption and generation of sound waves, acoustical measurements. **(3 cr)**

PHY 6101 Acoustics Laboratory **(1 cr)** *Coreq: PHY 6100*

PHY 6400 Relativity Theory I Introduction to Einstein's Theory of Special Relativity, Relativistic kinematics and dynamics. Lorentz invariance. Relativity and electromagnetism. Tensor analysis. **(3 cr)** *Prereq: PHY 4100 and 4200, or consent of chair.*

PHY 6402 Relativity Theory II Introduction to Einstein's Theory of General Relativity, Newtonian Gravitational and Tidal Forces. Linear Field Approximation. Gravitational Waves. Space-Time Measurements. Riemannian Geometry. Schwarzschild Solution. Black Holes and Gravitational Collapse. Cosmology. **(3 cr)** *Prereq: PHY 6400.*

PHY 6500 Supervised Study in Physics Reading and/or laboratory work in a selected branch of physics under the direction of a member of the staff. **(2 cr)** *Sem 1&2. Prereq: Consent of chair.*

PHY 6600 Supervised Study in Physics Same as PHY 6500 with increased number of hours. **(3 cr)** *Sem 1&2.*

PHY 6700 Supervised Study in Physics Same as

PHY 6500 with increased number of hours. (4 cr)

Sem 1&2.

POLITICAL SCIENCE

Chair and Associate Professor: Gustafson

Professors: Hahn, Johannes, Langran, Lesch, Malik, Schrems

Associate Professors: Barrett, Ellis, Kerbel, Sheehan, Strack, Thompson, Wheeland

Office: 202 St. Augustine Center, tel. 519-4710

MAJOR: Thirty credit hours in political science courses are required for a major including the two introductory courses and a senior seminar. Elective courses are divided into three areas: American Government and Public Law (2000 and 3000 level), Comparative Government and International Relations (4000 and 5000 level), and Political Theory and Behavior (6000-6800). The political science major must complete three courses from at least one area, two from another area, and one from the remaining area. One additional course must be taken for a total of ten courses. Political Science majors are encouraged to take two economics courses and more than the minimum number of courses in languages and mathematics.

CONCENTRATION WITHIN THE MAJOR: Nine additional credits beyond the 30 credits for a major may earn a student a certificate in a concentration area. Concentrations may be earned in: International Relations, Pre-Law, Public Administration, Pre-Graduate School, and Employment Oriented. A list of courses which satisfy each concentration is available in the departmental office.

MINOR: Fifteen credits consisting of the two introductory courses plus any three advanced courses will earn a student a minor in Political Sciences. Courses taken pass/fail cannot be used to satisfy requirements for the minor.

INTRODUCTORY COURSES

PSC 1100 Introduction to American Government

Constitutional development; national institutions, federalism, civil rights and liberties; instruments of popular control. (3 cr) *Prereq: to some 2000-3000 and 6000 area courses.*

PSC 1200 Introduction to International Relations

Factors in relations between states; the nature, elements, and role of power; problems faced by the modern state system. (3 cr) *Prereq: to some 4000-5000 area courses.*

Prereq: PSC 1100.

PSC 2100 City and Suburb Politics and problems in metropolitan areas of the United States. (3 cr)

Prereq: PSC 1100.

PSC 2200 American Party Politics The place of parties in national politics; the nature, organization, and functions of political parties; suffrage requirements and election methods; the activities of organized interests. (3 cr) *Prereq: PSC 1100.*

PSC 2250 Congress How national politics unfolds in the U.S. Congress, focusing on decision making and voting, leadership roles, committee politics, relations with the other branches, elections, and congressional reform. (3 cr)

PSC 2275 U. S. Presidency The nature, functions,

AREA 1: AMERICAN GOVERNMENT AND PUBLIC LAW

PSC 2000 State and Local Government

Constitutions, institutions, instruments of popular control, and intergovernmental relations. (3 cr)

and development of the American presidency, including relations between the president and other Washington actors, the public and the press. (3 cr) *Prereq: PSC 1100.*

PSC 2300 American Foreign Policy Formation The institutions, processes, and ideas which shape contemporary American foreign policy; the major problem areas. (3 cr) *Prereq: PSC 1100.*

PSC 2400 National Security Policy Development of strategic thought in the United States, arms control and disarmament, intelligence, technology, alliance policy, role of civilian and military branches of government, and related topics. (3 cr)

PSC 2500 Washington Minimester A three week series of seminars in Washington, D.C. with public officials, staff members, party leaders, and interest group representatives. See and study the workings of our government at first hand. (3 cr) *Offered during the month of May.*

PSC 2600 Public Policy Theories of public policy making, national public policies, and contemporary issues. (3 cr) *Prereq: PSC 1100.*

PSC 2700 Women and Politics Why women traditionally have been marginal to political life; the efforts of women in the past and today to change that fact; the problems that must be solved before women can translate their numerical strength into political power. (3 cr)

PSC 2800 Public Administration Administrative politics, law, and ethics, organizational theory, and technical fields, such as budgeting, planning, and personnel. (3 cr) *Prereq: PSC 1100.*

PSC 2900 Political Communication The role, behavior and influence of communications in American politics. (3 cr) *Prereq: PSC 1100.*

PSC 2993 Internship (3 cr)

PSC 2996 Internship Work experience in politics. (6 cr) *Prereq: PSC 1100.*

PSC 3100 Government and Business The relations between government and business,

including antitrust enforcement, regulation versus deregulation, environmentalism and consumerism, and economic policies. (3 cr)

PSC 3200 Early American Constitutional Development Factors affecting U. S. Constitutional growth from the Constitutional Convention through the early 1970s. (3 cr)

PSC 3300 Modern American Constitutional Development Factors affecting U.S. constitutional growth from the early 1970s to the present. (3 cr)

PSC 3400 Constitutional Law of the United States Major Supreme Court cases concerning the powers of Congress and the President, federalism, business, voting and abortion. (3 cr)

PSC 3500 Civil Rights and Civil Liberties Major Supreme Court cases in the areas of equal protection for women and minorities, rights of defendants, and First Amendment rights. (3 cr)

PSC 3600 Criminal Justice System The political phenomena of crime, nature of law, police, courts, correction, community crime prevention, and the procedures of local, state, and national agencies as political issues. (3 cr) *Prereq: PSC 1100.*

PSC 3800 Environmental Law and Regulation The manner in which our society protects or fails to protect the environment through law and environmental regulation. The relative efficacy, costs, and benefits of various types of this regulation. (3 cr)

AREA II:

COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS

PSC 4000 Comparative European Systems Political development, party systems, and governing institutions in western Europe. (3 cr) *Prereq: PSC 1200.*

PSC 4200 South Asia The historical development of India and Pakistan; their contemporary problems and conduct of foreign relations with the great powers. (3 cr)

PSC 4401 Russia An introduction to the

contemporary Russian political system emphasizing its transformation from the Communist system which preceded it. (3 cr)

PSC 4500 Japan and China Historical and cultural factors explaining Chinese and Japanese political behavior and modern institutions. (3 cr)

PSC 4700 Africa Cultural pluralism, African socialism, terrorism, politico-legal and socioeconomic development, and other problems of contemporary African states. The impact of colonial rule and socioeconomic changes on political life. (3 cr) *Prereq: PSC 1200.*

PSC 4750 Latin America Comparison of the political systems of Latin American countries. The role of the military, the church, elites, political parties, constitutions and social and economic factors which have shaped the development of the region. (3 cr) *Prereq: PSC 1200.*

PSC 4900 The Arab States Political change in the principal Arab States with emphasis on the diverse forms of rule and political movements. The impact of colonial rule and socioeconomic changes on political life, leadership, social structure, political culture, and modernization. (3 cr)

PSC 4950 Ireland Irish government and politics and their socioeconomic context. The impact of Ireland's increasing association with other European countries and the special problems associated with Northern Ireland. (3 cr) *Prereq: PSC 1200.*

PSC 5000 International Law The rules and principles of international law based on a study of treaties, diplomatic practice, and cases dealt with by international and national courts. (3 cr) *Prereq: PSC 1200.*

PSC 5100 International Organization The development of international organization, the U.N., its principles, structure, and accomplishments; regional organizations; prospects for the future. (3 cr)

PSC 5225 U.S. Foreign Policy Issues Contemporary foreign policy issues facing the United States; elements of continuity and change;

implementation and consequences. (3 cr) *Prereq: PSC 1200.*

PSC 5300 Contemporary Europe Trends towards integration and disintegration in eastern and western Europe. (3 cr) *Prereq: PSC 1200.*

PSC 5351 Russian Foreign Policy The development of Russian foreign policy in the post-Soviet period, historical roots; relations with the United States, Europe, the Far East and the developing countries; diplomatic; economic and military instruments of Russian policy. (3 cr) *Prereq: PSC 1200.*

PSC 5500 Africa in World Politics Political and economic problems in Africa south of the Sahara; problems of South Africa - past, present, and future; the interaction of states in regional organizations; Pan-Africanism; response of the outside world to African nationalism. (3 cr)

PSC 5600 Human Rights Transnational case studies of human rights; the nature and significance of human values in relation to the political process, law, and ideology. (3 cr) *Prereq: PSC 1200.*

PSC 5700 The Struggle for Power and Oil in the Inner Crescent International oil policy; economic and political systems of the oil producing states in the Arabian Peninsula, Persian Gulf, and the adjoining states, i.e. the Russia, Iran, Afghanistan, and Pakistan. The foreign policies of the super powers and the regional states. (3 cr)

PSC 5800 Politics of International Economics The politics international trade, economic interdependence, foreign aid, monetary relations, North-South relations, and national development. (3 cr) *Prereq: PSC 1200.*

PSC 5900 Middle Eastern International Relations Intra-regional and international problems facing the Middle East: the struggle for independence; the impact of the Cold War; the protracted conflict between Israelis and Arabs; and the tensions in the oil-rich Persian Gulf. (3 cr)

PSC 5950 Russia's Relations with the Islamic States Four sets of Islamic states: (1) 21

autonomous states within the Russian Federation, about half of which are Turkic and Muslim; (2) Central Asia; (3) Islamic states on the periphery of the former Soviet Union; and (4) in the Middle East. **(3 cr)**

AREA III:

POLITICAL THEORY AND BEHAVIOR

PSC 6000 Early Political Theories The relevance of the classics of political thought for understanding modern politics from the Greeks to the modern era. **(3 cr)** *Prereq: PSC 1100.*

PSC 6100 Modern Political Theories The structure of modern political thought and developments of twentieth century political thought as an aid to understanding our age. **(3 cr)** *Prereq: PSC 1100.*

PSC 6120 Principles of Politics An analytical, rather than historical, approach to the principles of politics. Justice, liberty, equality, purpose of the state, constitutionalism, political prudence, separation of powers, etc. **(3 cr)** *Prereq: PSC 1100.*

PSC 6130 Theories of War and Peace The major political theories about war and peace, and the importance of ideas of justice for them in ancient, non-Western, modern and contemporary theories. **(3 cr)** *Prereq: PSC 1200.*

PSC 6140 Theories of Religion and Politics The relation of religion and politics found in either classical, modern, or contemporary literature from the Western or non-Western, American or Latin American experience. **(3 cr)** *Prereq: PSC 1100.*

PSC 6150 Politics and Literature Politics in classical and modern literature. Sophocles, Thucydides, Plutarch, Shakespeare, Twain, Melville, Austen, Huxley, Orwell. **(3 cr)** *Prereq: PSC 1100.*

PSC 6200 American Political Theory Significant political ideas in the American experience from their European origins to the present with attention to the influence of these ideas in the development of

American political institutions. **(3 cr)** *Prereq: PSC 1100.*

PSC 6250 Introduction to Jurisprudence The nature and origin of law from historical and/or analytical perspectives. *Prereq: PSC 1100.*

PSC 6325 American Liberalism and Conservatism The main strands of American liberal and conservative thought and political practice. Rawls, Galbraith, Schlesinger to Goldwater, Kirk, and Buckley. *Prereq: PSC 1100.*

PSC 6650 Using Political Science: A Hands-on Approach Research methods, no prior knowledge expected. Design and conduct study of political and social attitudes in the Villanova community, probability and random sampling, research design, hypothesis testing and intelligent use of statistics, tests of significance, and basic data analysis. *Prereq: PSC 1100.*

PSC 6800 Political Violence and Conflict The nature of political violence and conflict emphasizing the human perspective. Origins and causes of political violence; socio-psychological explanations. Manifestations include terrorism, rebellion, revolution, and war. *Prereq: PSC 1200.*

Topics, Seminars, Independent Studies.
(Not Area III Courses)

PSC 6875 Topics in Political Science Selected area of special interest. **(3 cr)** *Permission of chair required.*

PSC 6900 Political Science Seminar Individual research and report on contemporary problems in political science. **(3 cr)** *For seniors. Required of political science majors; permission of chair required.*

PSC 6950 Independent Study and Research Individual students with specific interests work on a tutorial basis with an appropriate professor. **(3 cr)** *Permission of the chair is required.*

PSYCHOLOGY

Chair and Professor: Klieger

Professors: Blewitt, Brown, Bush, Long, Toppino, B. Ward, I. Ward, Ziegler

Associate Professors: Folk, Kendzierski, Tuck

Assistant Professors: Krauss, Kurtz, Sheldon

Office: 334 Tolentine, tel. 519-4720

MAJOR: PSY 1000 plus 28 additional credits including PSY 4000, 4050, 4100, 4150, 4200, 4500, and 12 elective credits (four electives). PSY 4000 and 4050 are corequisites taken together. Specific prerequisites for each course are enumerated below. Freshmen and sophomores who contemplate majoring in psychology may begin the major early by taking PSY 1000, plus any elective courses for which PSY 1000 is the only prerequisite.

To choose psychology as a major, a student must have earned a "C+" or higher in General Psychology (PSY 1000) or have a cumulative QPA of 3.00 or better. Because of course prerequisites, students should expect that completion of the major will require four semesters after their formal declaration of the major.

MINOR: PSY 1000 plus any combination of 12 undergraduate credits in psychology. Courses taken pass/fail cannot be used to satisfy requirements for the major or minor.

PSY 1000 is a prerequisite for all other courses in psychology.

PSY 1000 General Psychology Introductory examination of the fundamental concepts of psychology, with particular emphasis on the description of normal human behavior and those factors that underlie it. **(3 cr)** *Sem 1&2. Prereq: to all other courses in psychology.*

PSY 2200 Developmental Psychology Theory and research on social/personality, physical, and cognitive/ intellectual changes from infancy through old age. **(3 cr)** *Sem 1&2.*

PSY 2400 Cross-Cultural Psychology Theory and research on cultural influences on human diversity in behavior and psychological processes. **(3 cr)** *Sem 1.*

PSY 2500 Psychology of Personality Theories, dynamics, and structure of personality. Intended for non-psychology majors. **(3 cr)** *Sem 1&2.*

PSY 2600 Social Psychology Survey of theory and research on altruism, attraction, social cognition, the self, attitudes and attitude change, social influence, affiliation, personal control, and aggression. **(3 cr)** *Sem 1&2.*

PSY 2700 Industrial/Organizational Psychology Applications of psychological data, theories, research methods, and testing procedures to individuals in organizational settings. **(3 cr)** *Sem 1&2.*

PSY 2800 Human Factors Application of theories of human performance (perception, cognition, and motor control) to the design of products and systems. **(3 cr)** *Sem 2*

PSY 2993 Psychology Internship Supervised work experience in agency, hospital, school, or company. **(3 cr)** *Sem 1&2. Prereq: Psychology major, minimum 3.2 QPA in psychology courses, and permission of Internship Coordinator. Apply in Psychology Department Office. Graded P/F.*

PSY 2996 Psychology Internship Supervised work experience in agency, hospital, school, or company. **(6 cr)** *Sem 1&2. Prereqs: Same as PSY 2993. Graded P/F.*

PSY 3000 Special Topics Selected topics in psychology: motivation, comparative psychology, health psychology, the self, psychology and law, psychology of women, etc. **(3 cr)** *Sem 1&2.*

PSY 4000 Introductory Statistics Basic concepts, assumptions, and applications of descriptive statistics and inferential statistics. (3 cr) *Sem 1. Coreq: PSY 4050.*

PSY 4050 Research Methods in Psychology Introduction to the reading, design, and reporting of psychological research. (3 cr) *Sem 1. Coreq: PSY 4000.*

PSY 4100 Foundations of Modern Psychology Overview of the major concepts and theories of psychology presented in a historical context. (1 cr) *Sem 1.*

PSY 4150 Seminar in Professional Development Overview of ethical and professional issues in psychology. (3 cr) *Sem 2. Psychology Major.*

PSY 4200 Physiological Psychology Theoretical and laboratory examination of basic neural and hormonal processes underlying behavior. (3 cr) *Sem 2. Prereq: PSY 4000 and PSY 4050, or consent of instructor.*

PSY 4400 Perception Theory and application of sensory and perceptual processes such as distance perception, color vision, illusion and deafness. (3 cr) *Sem 1&2. Prereq: PSY 4000 and PSY 4050 or consent of instructor; laboratory to be arranged.*

PSY 4500 Cognitive Psychology Theory and research on human learning, memory, and cognitive processes. (3 cr) *Sem 1&2. Prereq: PSY 4000 and PSY 4050 or consent of instructor.*

PSY 5000 Psychology Seminar Overview and summary of current research, ethical issues, and professional issues in psychology. (1 cr) *Sem 1. Prereq: Senior status in psychology major.*

PSY 5100 Animal Learning and Cognition (3 cr)

Cognitive mechanisms responsible for simple behavior and behavioral change as they have been studied using animal subjects. *Sem 2. Prereq: PSY 4050 or consent of instructor.*

PSY 5200 Personality Theory and Research Contemporary theories of personality and the scientific investigation of personality variables. Intended for psychology majors. (3 cr) *Sem 2. Prereq: PSY 4050 or consent of instructor.*

PSY 5300 Psychological Measurement Basic principles and problems of psychological measurement in the assessment of behavior. (3 cr) *Sem 2. Prereq: PSY 4050 or consent of instructor.*

PSY 5400 Clinical and Counseling Psychology Fundamental concepts, basic areas of professional functioning and contemporary issues in the mental health field. (3 cr) *Sem 2. Prereq: PSY 4050 or consent of instructor.*

PSY 5500 Abnormal Psychology Classification, etiology, and treatment of mental and behavioral disorders with emphasis on contemporary theory and research. (3 cr) *Sem 1&2. Prereq: PSY 4050 or consent of instructor.*

PSY 5600 Computer Use for Social Scientists Statistical packages (statistical software) in the analysis of social science data. Prior computer experience not necessary. (3 cr) *Sem 2. Prereq: PSY 4000 or consent of instructor.*

PSY 5900 Undergraduate Research Supervised research project and report. Student may register for PSY 5900 more than once; however, only 3 hours of research can be applied toward the degree requirements in psychology. (3 cr). *Sem 1&2. Consent of Chair and instructor.*

SOCIOLOGY

Chair and Associate Professor: Waegel

Professors: Gallagher, Jones, Juliani, Knapp, McFalls, McKenna

Associate Professors: Arvanites, Eckstein, McGarry, Malik, Pattnayak, Shai

Assistant Professor: McKenzie

Office: 204 St. Augustine Center, tel. 519-4740

MAJOR: The Sociology major requires completion of 10 courses. Four courses are required of all majors, while the remaining 6 are selected by students on the basis of their interests or career aspirations. Introduction to Sociology (Soc 1000) is required of all majors and is the first course that students should take. In addition, 3 courses are required in the theory-methods area (5000 level courses). There are 3 sociological theory course offerings (Soc. 5000, 5050, and 5100) and 3 research methods course offerings (Soc. 5200, 5300, and 5400). Students are required to take 2 courses from one group and 1 course from the other group.

Majors who wish to structure their Program toward a specific career objective can choose courses from one of the following areas, each of which provides training for a different occupational career.

1. Business and Management Skills:

SOC 2700 Sociology of Organizations

SOC 2800 Sociology of Occupations

SOC 2900 Political Sociology

SOC 3600 Race and Ethnic Relations

SOC 3900 Social Stratification

SOC 3950 Social Change and Modern
Society

2. Criminology and Penology:

SOC 2000 Social Problems

SOC 2200 Sociology of Deviance

SOC 3020 Criminal Law and the
Community

SOC 3100 Juvenile Delinquency

SOC 3200 Penology and Corrections

SOC 3300 Sociology of Law

SOC 3450 Social Psychiatry

3. Social Services and Social
Administration:

SOC 2000 Social Problems

SOC 2300 Sociology of the Family

SOC 2400 Sociology of Social Work

SOC 2500 The Sociology of the
Community

SOC 2700 Sociology of Organizations

SOC 3400 Medical Sociology

SOC 3450 Social Psychiatry

SOC 3600 Race and Ethnic Relations

SOC 3700 Urban Sociology

4. Pre-Law:

SOC 2200 Sociology of Deviance

SOC 3000 Criminology

SOC 3020 Criminal Law and the
Community

SOC 3100 Juvenile Delinquency

SOC 3300 Sociology of Law

5. Graduate School: Two theory courses and two research methods courses plus 12 additional credit hours in upper division courses.

Majors who do not wish to select one of these specialized areas may take the 4 required courses identified above plus 6 additional courses selected in consultation with their advisor.

MINOR: SOC 1000 and four other courses chosen from the offerings of the department. The student must inform the chair of his or her intention to minor and request certification of the minor when it has been completed. A concentration in Criminal Justice is available for interested students.

A student may take an internship in a field setting in the second semester of the junior year or during the senior year. Students should consult with the Chair and Director of the Internship Program.

SOC 1000 Introduction to Sociology Introduction to the analysis of sociocultural behavior; emphasis upon the development of the social individual, collective and group behavior, social institutions and culture. (3 cr) *Sem 1&2.*

SOC 2000 Social Problems Significant problems of American society; the sociocultural basis of social problems, the conditions facilitating their incidence, and approaches to therapeutic intervention. (3 cr) *Sem 1&2.*

SOC 2100 Cultural Anthropology Principles of cultural anthropology; ethnological variations in language, techniques, customs and values; problems of cultural development and change. (3 cr) *Sem 1&2*

SOC 2200 Sociology of Deviance A sociological examination of rule-breaking behavior; causal theories of deviance; types of deviance and their distribution in contemporary society. (3 cr)

SOC 2300 Sociology of the Family Institutional organization of mate selection, courtship, and marriage relationships in American society; family relationships and functions; family disorganization and change. (3 cr)

SOC 2400 Sociology of Social Work History and development of social welfare; basic issues in social welfare planning and administration. The major methods of social work, practice; social casework, group work and community organization, in such areas as child welfare, family service and counseling, probation and corrections. (3 cr)

SOC 2500 Sociology of the Community Concentration on the changes in the structure of the community from container to network types. Emphasis on the necessity of community as rooted in social nature. (3 cr) *Sem 1&2.*

SOC 2600 Sociology of Religion The interaction between society and religion; religion and scientific claims; investigation of human nature as social and the concept of oneness in religion. (3 cr)

SOC 2700 Sociology of Organizations The structure of complex organizations and their relationship to other social institutions. Emphasis on the modern corporation, how corporations interact with labor and government, and how corporations and organizations affect our everyday lives. (3 cr) *Sem 2.*

SOC 2800 Sociology of Occupations Influence of the social milieu upon internal organizations of occupations and professional modes of selection, entrance, and training; occupational mobility and career patterns; occupational influences upon individual behavior. (3 cr) *Sem 2.*

SOC 2900 Political Sociology Relationships between state and society from a comparative perspective. Focuses primarily on the United States, with frequent references to the experiences of other developed nations as well as those of third world countries. (3 cr) *Sem 1&2.*

SOC 2993 Internship *To be arranged.* (3 cr)

SOC 2996 Internship *To be arranged.* (3 cr)

SOC 3000 Criminology The nature and extent of crime; the factors related to criminal behavior; theories of the treatment and control of offenders; crime prevention programs. (3 cr) *Sem 1&2.*

SOC 3010 Crime and Criminal Justice Crime and criminal justice in America with emphasis on law enforcement and administration of justice; a lecture-discussion course with a socio-legal focus. (3 cr) *Sem 1.*

SOC 3020 Criminal Law and the Community Survey of the aims of the criminal law in the community; the common-law and statutory law definitions of crimes; the problem of criminal responsibility; sentencing; and the comparison of criminal and civil laws in the social order. (3 cr) *Sem 2.*

SOC 3100 Juvenile Delinquency Meaning and scope of delinquency; delinquency theories; role of

social institutions and social agencies; prevention, control, and treatment programs. **(3 cr)** *Sem 1&2.*

SOC 3200 Penology and Corrections Survey of the historical and contemporary treatment of convicted offenders; analysis of the prison social system; analysis of the theory, practice and function of correctional programs. **(3 cr)** *Sem 2.*

SOC 3300 Sociology of Law The nature, scope and place of law in society. Law viewed as a collectivistic-individualistic process as a reflector of social values and culture. **(3 cr)** *Sem 1&2.*

SOC 3400 Medical Sociology Sociocultural patterns in illness and accidents; social structure of training in medical professions; relations of practitioner with patients, community and society; sociocultural variation in treatment and in use of medical facilities. **(3 cr)** *Sem 2.*

SOC 3450 Social Psychiatry Cultural and social patterns in the causation, incidence and treatment of mental health problems; emphasis upon current approaches to mental illness and the relation of mental illness to criminal, antisocial and deviant behavior. **(3 cr)** *Sem 1&2.*

SOC 3500 Sociology of Gender Roles Sex roles examined from a social learning and developmental perspective; recent changes in related attitudes and behaviors, consequences for interpersonal relationships and societal organization. **(3 cr)** *Sem 1&2.*

SOC 3600 Race and Ethnic Relations Development of race and ethnic relationships in America; the impact of power-conflict relations on race and ethnic patterns; particular attention given to development from early 1950's to present. **(3 cr)** *Sem 1&2.*

SOC 3700 Urban Sociology The nature of the city; history of urban settlement; urban form; institutions, organizational structures and processes; major problems of living in urban America. **(3 cr)** *Sem 1.*

SOC 3750 Human Populations The composition of and change in human populations; analysis of fertility; mortality and migration; emphasis on

current population, principles, problems and policies as well as practical applications. **(3 cr)** *Sem 2.*

SOC 3800 Collective Behavior and Social Movements Significant features of crowd, mob, and audience behavior; an analysis of their social basis and influence; examination of fads, fashions, and organized social movements as sociocultural behavior. **(3 cr)** *Sem 2.*

SOC 3900 Social Stratification Development and influence of class structures; emphasis upon modern stratification systems and their relation to community and societal power structures. **(3 cr)** *Sem 1.*

SOC 3950 Social Change and Modern Society The process of social change by which modern society and its dominant characteristics have developed. **(3 cr)**

SOC 4000 Special Topics in Sociology Topics addressing special or emerging interests, chosen for their current importance and the specific expertise of an instructor. **(3 cr)** *Sem 1&2.*

SOC 4100 Special Topics in Sociology Topics addressing special or emerging interests, chosen for their current importance and the specific expertise of an instructor. **(3 cr)** *Sem 1&2.*

SOC 5000 Nature and History of Sociological Theory The nature of sociological theory and the major theoretical developments which have shaped the field of sociology. **(3 cr)** *Sem 2. Prereq: SOC 1000.*

SOC 5050 Sociological Theory and Public Policy Explores how important sociological ideas can, and perhaps should, influence social policies. Students will be expected to design a theoretically driven empirical study which impacts on some public policy. **(3 cr)** *Prereq: SOC 1000 and consent of chair.*

SOC 5100 Contemporary Sociological Theory and Research Significant contemporary contributions to sociology theory and research. **(3 cr)** *Sem 1. Prereq: SOC 1000 and consent of chair.*

SOC 5200 Design of Sociological Research Basic methods of sociological research including the collection and organization of data, statistical analysis, testing hypotheses and the interpretation of data. (3 cr) *Sem 1. Prereq: SOC 1000 and consent of chair.*

SOC 5300 Data Analysis for Social Scientists This course is designed to provide students with a basic overview of research methods and statistics. Using real data, and statistical techniques commonly used in governmental agencies the link between theory and research will be emphasized. Students will develop the skills necessary to formulate a research question, collect, analyze, interpret and present data. (3 cr) *Prereq: SOC 1000 and consent of chair.*

SOC 5400 Applied Research Methods in Sociology

The development of real-world research skills through the application of sociological methods and statistics. Special emphasis is given to sampling, measurement, applied statistics, data management and evaluative research. (3 cr) *Sem 2. Prereq: SOC 1000 and consent of chair.*

SOC 6000 Independent Study and Research Supervised project or research culminating in research report or major paper. (3 cr) *Sem 1&2. Prereq: junior or senior status, consent of supervisor and chair.*

SOC 6500 Seminar in Sociology Advanced course for seniors focusing on particular substantive area; topics rotate. (3 cr) *Sem 1&2. Prereq: this course requires consent of chair.*

STUDIO ART AND MUSIC

Office: 205 St. Augustine Center, tel. 519-4760

Courses in Studio Art and Music are administered by the chair of the Theatre Department.

SAR 2020 Basic Watercolor Techniques Techniques of transparent watercolor painting with concentration on still life. (3cr) *Sem 1&2*

SAR 2021 Basic Drawing Techniques A foundation course in drawing, emphasizing visual concepts through work in a variety of media including charcoal, pencil and ink. Direct observation of the model, composition, perspective, and theory. (3 cr) *Sem 1&2.*

SAR 2022 Basic Oil Painting Basic techniques in the oil medium, with emphasis on understanding the nature of canvas as a vehicle, and color theory (3 cr) *Sem 1&2.*

SAR 2113 The Charm of Music A listening study approach to the many-faceted world of music from the great classics and their masters to the cultural explosion of the twentieth century. (3 cr) *Sem 1&2.*

SAR 2114 We Write the Songs Fundamentals of rhythm, harmony, melody, and formal design will be covered, followed by a student composition. (3 cr) *Sem 1. No previous musical study needed.*

SAR 2115 Orchestral Music The major literature of the symphony, symphonic poem and concerto from Haydn through mid-twentieth century. (3 cr) *Sem 1.*

SAR 2118 The Broadway Musical The art form of American musical theatre, beginning with roots in late 19th century operetta, the emergence of jazz, folklore, big band era, up to the present. (3 cr) *Sem 2.*

SAR 2119 Jazz: Born in the USA A listening study of the greats of American Jazz, beginning with Ragtime, New Orleans, Big Band, Swing, Fusion and current trends. (3 cr) *Sem 2.*

THEATRE

Chair and Assistant Professor: Donohue
Professor: Christy
Associate Professor: Rotte, Cannuli
Assistant Professors: Power, Stagliano, Lloyd
Instructor: Maloney-Truitt
Office: 205 St. Augustine Center, tel. 519-4760

MINOR: Students may fulfill a Theatre Minor by completing five theatre courses (three required/two elective) and a theatre practicum. Interested students should request further information through the Theatre Department Office in St. Augustine Center for the Liberal Arts, Rm. 484.

Students majoring in Communication may declare Theatre as their Area of Emphasis. Students majoring in Education may declare an English/Communication Arts concentration with Theatre as the Area of Emphasis.

Any student may educate himself/herself in the art and craft of theatre through Electives and through participation in the department's Theatrical Productions. Auditions and backstage positions are open to all undergraduates for the entire academic theatre season.

THE 2019 The Theatrical Experience The variety of arts and crafts that combine to create theatre. Through hands-on experience, discussion, and performance, the interrelations among dramatic idea, stage direction, acting, design and technical elements that harmonize in a theatrical production are discovered. **(3 cr)**

THE 2025 Improvisational Theatre Improvisation to explore non-verbal communication strategies and the study of theatre as a communication medium. Readings in non-verbal communication and modern theatre theory. **(3 cr)**

THE 2029 Fundamental Principles of Acting Traditional acting theories and basic techniques: games, improvisation, sensory awareness exercises and beginning work on scenes. **(3 cr)**

THE 2030 Advanced Principles of Acting Expands the use of acting theory and techniques through advanced exercises and scene work. Emphasis on the development of imagination, artistic conceptualization and characterization. **(3 cr)**

THE 2032 Elements of Dance The broad range of dance styles, dance theory, vocabulary, and body

placement. **(3 cr)**

THE 2033 Advanced Elements of Dance Expanded study of dance styles, dance theory, vocabulary, and body placement. **(3 cr)**

THE 2034 Musical Theatre Explores the conventions of musical theatre. Practical work in the application of musical performance theory to specific song, movement and stylized acting techniques. **(3 cr)**

THE 2040 Theatre Practicum Significant and responsible participation in the department's production program. **(0 cr)**

THE 2051 Creativity in the Theatre Employing writing, acting, directing, movement, film, music and mixed-media elements, the course creates an experimental definition of theatre including content, structure and form. **(3 cr)**

THE 3006 Shakespeare on Stage Shakespeare texts as theatrical experiences, including both traditional and modern approaches to directing Shakespeare. Practical scene work to make complex language accessible to beginning students. **(3 cr)**

THE 3008 Black Theatre Focuses on the development of Black theatre as an outgrowth of African-American historical evolution with an emphasis on those plays which are enduring. **(3 cr)**

THE 3020 The Teaching of Acting A laboratory course for teachers of dramatic arts at the junior and senior high school levels. Emphasis is on the development of teaching skills, including exercises in movement, improvisation and scene study. **(3 cr)**

THE 3030 Special Topics in Theatre A specialized area of theatre studies (e.g., avant-garde, feminist, Asian, Melodrama), combining elements of theatre history, dramatic literature and criticism, as well as performance and production aspects of live theatre. **(3 cr)**

THE 4014 Women and Theatre The contribution of women artists to the American theatre, discussing the particular social issues, and the pertinent historical perceptions and problems encountered by women in the arts. **(3 cr)**

THE 4020 Directed Studies in Theatre Reading and practical work in a specialized area of theatrical production or scholarship under the direction of a faculty artist or scholar. **(3 cr)**

THE 7002 Directing The process of stage directing, including script interpretation. Emphasis is on the use of action, movement, design and rhythm in staging techniques. **(3 cr)** *Open to seniors only. Prereq: THE 2019 and THE 2029 and consent of chair.*

THE 7003 Acting/Directing Styles Acting and

directing employing the techniques used to approach classical texts. For actors, emphasis will be on the relationship between performance style and the language of classic texts; for directors, the requisite stage imagery. **(3 cr)** *Open to seniors only. Prereq: THE 2019, 2029 and consent of chair.*

THE 7010 Scenography Investigation of the stage metaphor and image for the director/actor and beginning designer. Emphasis on translating intellectual production concepts into visual ones. **(3 cr)** *Open to juniors and seniors. Prereq: THE 2019, 2029 and consent of chair.*

THE 7051 Playwriting The principles of playwriting as seen through structural analysis of selected plays in a variety of genres. Assignments include scene writing and playwriting. **(3 cr)** *Open to undergraduate juniors and seniors. Prereq: THE 2019, 2029 and consent of chair.*

THE 7052 Voice and Movement for the Actor Eastern and Western theories of voice production and body work. Application of techniques to integrate the components of the performing artist's physical instrument. **(3 cr)** *Open to undergraduate juniors and seniors. Prereq: THE 2019, 2029 and consent of chair.*

THE 7500 Stage/Arts Management Tools for stage management within a variety of theatrical settings including auditions, rehearsals and theatre productions, and the relationship of the stage manager to the artistic, and technical personnel, box office manager, and audience. **(3 cr)** *Open to undergraduate juniors and seniors. Prereq: THE 2019 and consent of chair.*

THEOLOGY AND RELIGIOUS STUDIES

Chair and Assistant Professor: Chappell

Professors: Binns, Conn, Dobbin, Prusak, Scanlon, Van Allen

Associate Professors: Benavides, Eigo, Inati, Lazor, Loya, Ommen, Toton, Werpehowski

Assistant Professors: Agnew, Danove, Doyle, Enright, Godzieba, Hadley, Makowski, Martin, Pohlhaus, Veverka

Instructors: Laferty, Ruscil
Office: 107 St. Augustine Center, tel. 519-4730

MAJOR: Thirty credit hours *exclusive* of the required introductory course, THL 1050, which students in the College of Liberal Arts and Sciences must take in the sophomore year. Twenty-four credit hours are to be taken from among the following: THL 2725 and 2726 (to be taken as soon as possible after the major is declared); one course in Biblical Studies; THL 3100 or 3500; THL 3200; a choice of one among THL 3300, 3325, 3400, 3600; a choice of one among THL 5100 through 5300 plus 5500 and 5510. A student may choose the remaining six credit hours from any of the other Theology and Religion Studies courses. THL 3500 is especially recommended.

MINOR: Eighteen credit hours *inclusive* of the required introductory course (see above). Normally, a minor should be declared in the sophomore year or no later than the second semester of junior year. All courses required for the major are highly recommended for minors, especially THL 2725 and 2726; at least one Scripture course; THL 3500; and a selection from among THL 5100, 5150, 5260, 5270, 5280, 5700.

THL 1050 is a prerequisite for all other courses in Theology and Religious Studies.

INTRODUCTION

THL 1050 Christianity: Traditions and Transitions Required introductory course; a critical, academic introduction to the major themes of the Christian traditions from historical, scriptural and theological perspectives, including themes such as: God, Jesus, the human response to God. **(3 cr)** *Required for all students at the University; prerequisite for all other courses.*

BIBLE STUDIES

THL 2000 Introduction to the Bible Critical analysis of biblical books; general scriptural themes; use of textual, source, form, redaction, and literary criticism. **(3 cr)**

THL 2050 Introduction to the Old Testament Critical analysis of Old Testament books; Creation, Covenant, Ten Commandments, Exodus, Conquest, Prophets, Apocalyptic Literature; historical and archaeological focus; use of textual, form, redaction, source and literary criticism. **(3 cr)**

THL 2100 Pentateuch and Early History Moses, Abraham, Jacob, Adam and Eve, David, Solomon, Samson, Samuel and others; social, political and religious life situations of these; relevant ancient Near Eastern beliefs and customs. **(3 cr)**

THL 2200 Hebrew Prophets and Wisdom Literature Isaiah, Jeremiah, Ezekiel and "the 12"; the meaningfulness of the Prophets in today's

world; Hebrew Wisdom Literature; influence of Egyptian and Greek culture. **(3 cr)** *Prereq: introductory Bible course or permission of instructor.*

THL 2300 Introduction to the New Testament Critical analysis of New Testament texts: structure, meaning, historical development, continuing vitality and application; introduction to transmission of traditions, formation of New Testament canon, use of textual, source, form, redaction, and literary methods. **(3 cr)**

THL 2310 Synoptic Gospels Critical analysis of Matthew, Mark and Luke: structure, meaning, historical development, continuing vitality and application; use of textual, source, form, redaction, and literary methods. **(3 cr)** *Prereq: introductory Bible course or permission of instructor.*

THL 2320 New Testament Letters Critical analysis of Pauline and Catholic epistles: structure, meaning, continuing vitality and application; use of textual, source, form, redaction, and literary methods. **(3 cr)** *Prereq: introductory Bible course or permission of instructor.*

THL 2330 Johannine Literature Critical analysis of the Gospel and Letters of John: structure, meaning, historical development, continuing vitality and application; use of textual, source, form, redaction and literary methods.

(3 cr) *Prereq: introductory Bible course or permission of instructor.*

THL 2400 Archaeology of the Bible

Contributions of archaeology to biblical study; the cultural context of people and places depicted in the Bible; explanation of archaeological methodology and history of excavations in the ancient Near East and the Holy Land; discoveries relating to the Bible. **(3 cr)** *Cross-listed with Honors.*

THL 2420 Women in the Bible Analysis of stories about women in the Bible: traditional and feminist readings examined; use of textual, source, form, redaction and literary methods. **(3 cr)** *Diversity; cross-listed with Women's Studies.*

THL 2480 Themes in Bible Studies

Interdisciplinary approach to biblical texts. **(3 cr)**

THL 2490 Advanced Topics in Bible Studies

Critical exegesis of biblical texts: use of scholarly methods of analysis. **(3 cr)** *Prereq: Introductory Bible course or permission of instructor.*

HISTORICAL STUDIES

THL 2500 The Formation of Tradition: Ancient Christianity Early Christian writings, controversies, councils and events; growth of Christianity from persecution to official acceptance in the Roman Empire; God, creation, evil, Jesus Christ, Church, Christian living, Holy Spirit, culture. **(3 cr)**

THL 2525 Miracles, Mystics and Monks:

Medieval Christianity Christianization of Europe during the Middle Ages (500-1500): conversion of the Barbarians, the cult of the saints, Monasticism, the sacraments, popular religion, the Crusades, Heresy and Church Reform. **(3 cr)**

THL 2550 Protestantism and Catholicism:

Reformation Christianity The break-down of the Medieval Church (1500-1700) inaugurated by Martin Luther; the creation of Protestant Churches; the formation of Tridentine Catholicism; the beginnings of the Enlightenment. **(3 cr)**

THL 2575 Christianity and the Modern World

Christianity from 1648 to the present; emphasis on the impact from science, philosophy, psychology, socio-political theories, and criticism. **(3 cr)**

THL 2590 Themes in Historical Studies

Courses of varying content in historical studies offered on occasional basis. Topics include: Religion in the Age of Romanticism; Roman Catholic Modernism; Vatican II: Evolution or Revolution. **(3 cr)**

THL 2725 Christian Classics I

Major theological themes in classic texts of Christian history from the early Church to Reformation; status and interpretation of biblical literature, grace and freedom, faith and reason, Christ and culture; texts from Augustine, Aquinas, Luther and others. **(3 cr)** *Required for majors.*

THL 2726 Christian Classics II

Christian history from seventeenth century to present: hermeneutics and relation between Christian commitment and Culture; texts from diverse theological works of Kierkegaard, Rahner, Teilhard, Barth, etc. **(3 cr)** *Required for majors.*

THL 2750 St. Augustine: Life and Message

Historical context for the life and message of Augustine; significant theological issues, controversies and events, elements of influence. **(3 cr)**

THL 2790 Themes in Patristic Studies

Courses of varying content in patristics offered on occasional basis. **(3 cr)**

THL 2900 Catholicism in the United States

The history and development of Catholicism in the United States; emphasis on understanding the present and investigating the future from the perspective of the past. **(3 cr)**

DOCTRINAL STUDIES

THL 3100 Christian Anthropology

The relationship between God and the human person from a variety of viewpoints: human origins; the purpose of life; the problem of evil and the human condition; salvation as divinization — insights and approaches of recent writers. **(3 cr)**

THL 3200 Understanding Jesus the Christ The historical Jesus and questions of method; christologies of the early Christian sources and councils; the later tradition of Christological reflection; contemporary trajectories. (3 cr)

THL 3300 Church: Unity and Diversity The origins of church as community and its relation to Jesus; development of the church within history; the ministry of the baptized and the ordained; teaching, leadership, service functions; the role of women; the church's relation to public discourse and practice. (3 cr)

THL 3325 Authentic Life in the Church Ecclesiological and pastoral issues in contemporary Christian community; authority and shared ministry; obstacles and future possibilities from perspectives of scripture, tradition and phenomenology. (3 cr)

THL 3350 Catholic Cult and Catholic Creed Consideration of the relationship between Catholic belief and practice as updated and applied in the light of past and present church doctrine. (3 cr)

THL 3400 Sacraments: Worship and its Symbols History of Christian sacraments; sacraments as celebrations of life in God; theology of worship as fulfillment of being human; present and future shapes of Christian liturgy; applications to particular sacraments, e.g., baptism, reconciliation, eucharist. (3 cr)

THL 3500 God and the Future of History The process of history as a cooperative venture of divine and human activity; creation and incarnation—God's initiatives within a future-oriented process; human suffering, the cross, resurrection; human freedom and redeemed optimism; Christians as critical participants in society. (3 cr)

THL 3550 Presence and Absence of God Theism and the atheistic critiques of the nineteenth and twentieth centuries; the problem of God in western culture; contemporary retrieval of the doctrine of God as Trinity. (3 cr)

THL 3600 Christians at Prayer What Christians

do or say at prayer; prayer as the dynamic of the Christian community; Jewish roots; liturgy as prayer; prayer as the ground of theology. (3 cr)

THL 3700 Catechism of the Catholic Church Theological analysis of the most recent official statement (*Catechism of the Catholic Church*, 1992, ET 1994) of the practices and beliefs of Roman Catholicism. (3 cr)

THL 3710 Roman Catholic Identity A critical exploration of the Roman Catholic tradition in the light of the student's personal experience; identity issues and church membership of young adults. (3 cr)

THL 3720 Apocalypse Then and Now The end of the world in present-day imagination; Christian hope/anxiety through the centuries; biblical apocalyptic; endtime views in the early church; significant figures and movements; beyond the millennium. (3 cr)

THL 3730 Feminist Theology Feminist theological methods and goals; theological reconstructions of Christian understandings of nature, humanity, God, sin and salvation, the church and its mission from the perspective of women's experiences. (3 cr)

THL 3740 Liberation Theologies Theologies emerging from specific struggles for liberation in Latin America, Africa, Asia, and North America; their context, content, and critique. (3 cr)

THL 3750 Art and Religious Imagination Art as orchestration of transcendence; critiques of traditional images of God; role of religious imagination in society, spirituality, and sacramentality. (3 cr)

THL 3790 Themes in Doctrinal Studies Courses of varying content in doctrinal studies offered on occasional basis. (3 cr)

THL 3795 Themes in Roman Catholic Studies Courses of varying content in Roman Catholic studies offered on occasional basis. (3 cr)

STUDIES IN CHRISTIAN
MORAL LIVING

THL 4100 Christian Ethical Traditions and Contemporary Life Christian moral commitment; current moral problems facing the Catholic; the nature of the human person; Jesus as the model and source of moral life; the development of teachings in morality and the role of the authority of the Church. (3 cr)

THL 4200 Ethics of Life and Death Explorations of selected issues in biomedical ethics (e.g., abortion, euthanasia). (3 cr)

THL 4300 Ethical Issues in Peace and Justice Intensive study of one or two timely issues or problems in moral theology: Christian teaching on war, conscientious objection, pacifism, poverty, social justice. (3 cr)

THL 4310 War and Morality Just war, pacifism, and feminist critique--three Christian traditions of reflection on ethics and warfare; conflict and overlap across these traditions; close examination of historical illustrations of the conduct of war. (3 cr)

THL 4320 The Social Teachings of the Christian Churches Historical and systematic examination of major modern Christian movements in social ethics, e.g., the Social Gospel, Christian realism, Catholic social thought; the relevance of these schools to current reflection on war and peace, justice and injustice. (3 cr)

THL 4330 Theology, Ethics, and Christian Tradition The methods and sources of Christian theological ethics; classic approaches of Augustine, Aquinas, Luther, Calvin and contemporary representatives; the meaning of Christian love; Christ and the moral life; the relations between church and world. (3 cr)

THL 4340 Ethics, Justice and the Family Interdisciplinary investigation of the moral and theological importance of the family in Christian ethics; traditional and revisionist approaches to sexuality and marriage; the family as a school for justice and virtue. (3 cr)

THL 4350 Service and Education for Justice The integration of action and critical reflection; U.S. poverty, hunger, and homelessness: its victims, roots, and remedies; the Christian moral imperative to love the neighbor; service, advocacy and solidarity (3 cr) (15 hours of service required). Permission of instructor; cross-listed with *Peace & Justice*; diversity.

THL 4400 Christian Marriage Christian marriage in the 20th century; scriptural, historical, legal, and moral issues; preparations for the wedding liturgy and Christian married life. (3 cr)

THL 4500 Christian Spirituality The Christian spiritual experience through the centuries. (3 cr)

THL 4600 North/South: Development Ethics Promoting equitable, sustainable development: challenges and choices; Colonialism, trade, aid, investment, population, consumption, militarism, race and gender equality, ecology. (3 cr)

THL 4690 Themes in Christian Living Courses of varying content offered on an occasional basis. (3 cr)

ECUMENICAL AND CULTURAL
STUDIES

THL 5100 The Heritage of Judaism Development of the religious tradition of the Jewish people; the Torah, the Talmud and other commentaries; Jewish ideals in ethnic literature. (3 cr) Diversity

THL 5150 Introduction to Islam Islam: history and development; beliefs and rituals; sects and intellectual movements. (3 cr) Diversity, *Africana Studies*, concentration or minor in *Arab/Islamic Studies*.

THL 5160 Islamic Mysticism Islamic mysticism: sources; development and principles; contribution and influence. (3 cr) Diversity, concentration or minor in *Arab/Islamic Studies*; cross-listed with *Philosophy*.

THL 5170 Islamic Philosophy and Theology Islamic rationalism and the crisis of moderate and conservative Muslim theologians; the dialectical

struggle between Islamic philosophy and theology. **(3 cr)** *Diversity, concentration or minor in Arab/Islamic Studies; cross-listed with Philosophy.*

THL 5180 Islamic Political Thought Integration of Islamic philosophy, religion, political science and history; the state in pre-Islamic Arabia, the Qur'anic concept of the state, the crisis of succession, Muslim theorists, revival and reform. **(3 cr)** *Diversity, concentration or minor in Arab/Islamic Studies, cross-listed with Philosophy.*

THL 5190 The Problem of Evil Formulations of the problem and historical attempts to solve it. **(3 cr)** *Diversity, medieval philosophy, concentration or minor in Arab/Islamic Studies.*

THL 5260 Mysticism: East and West A comparison of non-institutional forms of religion through the mystical texts from the Indian, Chinese, Buddhist and Christian traditions. **(3 cr)**

THL 5270 Religion in India and Southeast Asia The doctrinal and social history of the religious traditions of India and Southeast Asia: Hinduism, Buddhism, Jainism, Islam and Sikhism; the role of these religions in contemporary Indian and Southeast Asian societies. **(3 cr)**

THL 5280 Religion in China and Japan The doctrinal and social history of the religious traditions of East Asia: Confucianism, Taoism, Shinto, Buddhism; popular religion and state cults; the role of these religions in contemporary Asian societies. **(3 cr)**

THL 5285 The Buddhist Tradition The doctrinal and social history of Buddhism: its origins in India, its current forms in Central, East and Southeast Asia; the role of Buddhism in contemporary Asian societies. **(3 cr)**

THL 5300 Eastern Christian Life and Thought The historical and theological developments of the Eastern Christian tradition, relationship with other contemporary religious traditions. **(3 cr)**

THL 5400 Science and Religion The interaction

of science and religion from Galileo to the contemporary period. Theological implications of recent developments in the natural sciences. **(3 cr)**

THL 5500 One Church, Many Churches The issues that divided Christians in the past; developments in the major traditions since the divisions; factors which may aid in the reunion of Christians; confront issues at this time. **(3 cr)**

THL 5510 Religion in Russia An introduction to the history, mind, spirit and life of Russian Orthodoxy; its influence in its adherents in the modern, complex and pluralistic world. **(3 cr)** *Diversity; Russian Concentration.*

THL 5700 Black Religious Experience Black religious experience and heritage; African and Afro-American perspectives. **(3 cr)** *Diversity.*

THL 5800 Religion and Contemporary Literature Religious attitudes and experience in contemporary literature. **(3 cr)**

THL 5820 Religion and Education in American Culture The role of religion and education in the formation of American Culture; historical perspectives on Catholic and Protestant strategies in the education of the public; contemporary issues of religious pluralism and the search for the common good; religion and education in a culture of disbelief. **(3 cr)**

THL 5840 Feminist Ethics: Women, Identity and Moral Development Theories of moral development and the cultural construction of identity. Impact of women's ways of being and knowing on ethical decision making. **(3 cr)** *Diversity, Women's Studies.*

THL 5850 Women in Religion and Society Examination of women's experiences in religious traditions with special emphasis on Christianity. **(3 cr)** *Diversity, Women's Studies.*

THL 5900 Religion and Psychology Attempts of James, Freud, Jung, Fromm, Allport, Maslow, Erikson and others to relate religion and psychology. **(3 cr)**

THL 5950 Death and Dying Psychological, philosophical, and theological contributions to the search for meaning regarding dying, death, and belief in afterlife; practical issues; biblical perspectives; the views of other religions; contemporary Christian theological reflections. (3 cr)

THL 5990 Themes in Ecumenical and Cultural Studies Courses of varying content of ecumenical and cultural studies offered on an occasional basis. (3 cr)

THL 6400 Independent Study (3 cr)

WOMEN'S STUDIES

Director: Wall

Associate Director: Asher

Office: 442 St. Augustine Center, tel. 519-4798

The Women's Studies Program is an interdisciplinary program providing courses, a minor and a concentration in Women's Studies. It is open to students in all degree programs.

MINOR: an Integrating Seminar and 5 additional courses of which at least 2 must be from Category A. The Integrating Seminar is required of all students and is offered every spring.

CONCENTRATION: An Integrating Seminar and 7 additional courses of which at least 3 must be from Category A. The Integrating Seminar is required of all students and is offered every spring.

Category A:

CA 3200 - Gender and Communication
ENG 2300 - Women in Literature
HIS 2296 - Changing Roles for Women in American Society
or
HIS 3361 - Women and Society in Modern Europe

PHI 2425 - Philosophy of Women
PJ 5300 - Race, Class and Gender
SOC 3500 - Sociology of Gender Roles
THL 5850 - Women in Religion and Society
WS 5000 - Integrating Seminar

Category B:

AAH 3001 - Women in Art
CA 2015 - Women in Film
CA 2018 - Families on Fil
CLA 3051 - Women in Classical World
ECO 3118 - Women in the Economy
NUR 4800 - Women's Health Issues
PHI 2430 - Eco-feminism
PSC 2700 - Women and Politics
PSY 3000 - Psychology of Women

SOC 2300 - Sociology of the Family
THE 4014 - Women and Theatre
WS 3000 - Independent Study
TOPICS - Courses in several departments are offered each semester. (Please see Director, Women's Studies.)

WS 5000 Required Integrating Seminar An interdisciplinary course that focuses on a topic

through a methodology that requires Women's Studies minors to provide input from the research

areas of their majors. **(3 cr)** *Prereq: permission of the director.*

COLLEGE OF COMMERCE AND FINANCE

Thomas F. Monahan, Ph.D., CPA, Dean
Matthew J. Liberatore, Ph.D., Associate Dean

“Rapid changes in contemporary society have forced us to rethink our understanding of the world of business. Even an introductory grasp of business requires an understanding of changing domestic and foreign realities, a broad and flexible intellectual approach, and a sensitivity to complex and challenging ethical issues. The study of business is thus an immensely rewarding activity which prepares the learner for virtually any endeavor.”

HISTORY

The College of Commerce and Finance was founded in 1922. Since that time, it has attracted outstanding undergraduate and graduate students from across the nation and the world. Current undergraduate enrollment is approximately 1900. Graduate enrollment in the MBA program stands at 650 part-time and full-time students, while the Master of Tax program, offered jointly with the Villanova Law School, enrolls approximately 200 part time students.

The undergraduate business and MBA programs of the College are fully accredited by AACSB-the International Association for Management Education. In addition, the accounting program is separately accredited by the AACSB and, as such, is among a select number of collegiate programs so designated.

The College faculty consists of 83 full time professors, with over ninety percent holding the doctoral degree in their area of expertise. Approximately 20 adjunct professors drawn from industry are also part of the faculty contingent. The faculty is widely recognized for their excellence in teaching, research and professional service.

OBJECTIVES

We seek to be a leader among business schools in fostering a learning environment that enables members of our community to develop the knowledge, experience, values and capabilities needed for a life time of learning consistent with the moral vision of St. Augustine. Strengthened by our liberal arts foundation, we also strive to collaborate with the business and academic communities to create, share, and apply knowledge.

We value and support:

- ? the rich tradition of Catholic Social Teaching and the guidance it provides for all College activities
- ? an environment of mutual respect, professional development, and continuous improvement
- ? a quest to achieve educational distinctiveness in the markets in which we choose to compete
- ? active partnership with other units of the University
- ? the mutually supportive activities of teaching, research, and service

Villanova University

- ? innovation and experimentation by faculty and staff in achieving continuous improvement in the educational delivery process
- ? all dimensions of scholarship, including teaching, discovery, integration, and application
- ? stakeholder-based perspectives in decision-making
- ? life-long relationships with our graduates
- ? a learning environment for both students and faculty
- ? diversity of opinion and thought, as they relate to the development of operational strategies and tactics chosen to accomplish our mission

The College of Commerce and Finance awards both undergraduate and graduate degrees signifying the accomplishment of an education that empowers the student to effectively compete in the global marketplace. Attaining a Bachelor of Science degree in Accountancy or Economics; a Bachelor of Business Administration in Finance, Management, or Marketing; a Master of Business Administration, or Master of Taxation clearly identifies the holder as a technologically competent, internationally aware, ethical and socially responsive, adaptive problem solver who is skilled in the effective and efficient use of communication arts and strengthened through practical experience.

The keystone initiative of the College's strategic plan, technological competence, is enhanced in several ways during the students' academic experience. ALL INCOMING FRESHMEN ARE ISSUED A NOTEBOOK COMPUTER BEFORE THE START OF FRESHMAN CLASSES. THIS NOTEBOOK COMPUTER IS REPLACED PRIOR TO THE STUDENT'S JUNIOR YEAR TO INSURE THE AVAILABILITY OF STATE-OF-THE-ART TECHNOLOGY. This technology program also provides extensive software programs, technical support, and introductory training. The College is one of a very select number of institutions nationwide providing this level of extensive exposure to technology.

SPECIAL PROGRAMS

BUSINESS MINORS

Business Minors for Students who are not enrolled in the College of Commerce and Finance

1. Traditional Track (Spread over several semesters)

Students enrolled in other colleges of the University may seek a general business minor upon application to, and approval by, the Dean of the College of Commerce and Finance. Generally, students begin their studies in their sophomore year. Enrollment is determined on a competitive basis. Required business courses are: ACC 1001 and either ACC 1101 or ACC 1102; BL 1090; ECO 1001, 1002; FIN 1113; MGT 1102; MKT 1137; MAT 1230 and 1235. MAT 2310 or 4310 may be substituted for students who have completed a calculus sequence. Business minors are required to purchase a notebook computer with a configuration specified by the College.

2. Villanova Summer Business Institute (One full summer; two sessions)

The Villanova Summer Business Institute (SBI) is an innovative, intensive program of instruction seeking to provide the motivated non-business student with broad exposure to the major foundational areas of business education, and is recognized as a business minor by the College. The Institute's unique aspect is the integrated, cross-functional teaching approach employed throughout. Faculty from each of the two relevant subjects covered in the course will be present in all class meetings, thereby effecting a truly interdisciplinary teaching approach.

Specific course work will include:

BUS 1102 *Integrated Principles of Finance & Financial Accounting*

BUS 1103 *Integrated Principles of Marketing and Organizational Management*

BUS 1104 *Integrated Principles of Operations Management and Managerial Accounting*

BUS 1105 *Integrated Principles of Micro and Macro Economics*

Recognizing the pervasive influence of law through the totality of business, appropriate Business Law topics are integrated into all courses of the Institute.

Students must be in good academic standing and have completed 60 credits to apply to SBI. Included within these 60 credits should be either MAT 1230, 1250 or STA 2107, or their equivalent. Students who have not taken either of the above, but believe they have demonstrated sufficient skill in another quantitative discipline, may petition the Director of the Summer Business Institute (Room 325, Bartley Hall) for a waiver of this requirement. Each case will be decided on its own merits. Failure to gain admission in one summer will not prejudice a student seeking admission in the future after remedying the deficiency. Full details on the Summer Business Institute are available from the Director, Room 325, Bartley Hall.

Business Minors for Commerce and Finance Students

Students in the College of Commerce and Finance may pursue a minor in the following business areas with the requirements listed.

1. Economics: ECO 2101, 2102 and any two Economics courses above 3000.
2. Finance: FIN 1113 plus any three other Finance courses not including FIN 3350 and FIN 3360.
3. International Business: MGT 2410 plus three courses from the following: ECO 3109; FIN 2335; BL 2160; MKT 2280; MGT 2350. Completion of two semesters of a foreign language at or above the intermediate level and an international experience are required.
4. Management Information Systems: CSC 1051, MGT 2165, MGT 2170, and MGT 2175
5. Marketing: MKT 1137 plus three (3) other MKT courses, one of which must be either MKT 2120 or 2197. Graduates of the Summer Business Institute may also minor in Marketing, with the same requirements.

NON-BUSINESS MINORS FOR COMMERCE AND FINANCE STUDENTS

Students enrolled in the College of Commerce and Finance may pursue minors in programs offered by other colleges of the University, including the Honors Program. The minors are described in the appropriate section of this *catalog*, and detailed information on the process for approval may be obtained in the departments of the minors being pursued.

INTERNATIONAL STUDY

The College of Commerce and Finance supports an International Student Exchange Program. Alliances have been developed between Villanova and several international institutions. The International Studies Office (SAC 415) provides assistance to students desiring to study in a foreign country, and offers a variety of semester, year-long, and summer programs. Courses at international universities must be approved in advance by the chair of the student's major department.

VILLANOVA INTERNSHIP PROGRAM (VIP)

The intent of the Villanova Internship Program is to provide meaningful pre-professional work experience for students. The VIP is a partnership among the student interns, the company and supervisor, the sponsoring faculty member and the College of Commerce and Finance. The overriding goal is to better prepare students to compete in the job market. Additionally, students may explore several career fields and make more informed decisions regarding their initial job search. The Office of Business Relations works with students and companies to structure appropriate internship experiences. Students should contact the Office for complete details regarding minimum QPA, application procedures, academic credit, etc. The Office is located in Room 325, Bartley Hall.

Villanova University

DEGREES OFFERED

The College of Commerce and Finance offers the Bachelor of Science degree in Accountancy, Economics, and Business Administration.

BACCALAUREATE DEGREE REQUIREMENTS

The Bachelor of Science degree in the College of Commerce and Finance has the following requirements:

- ? Completion of all *core curriculum and academic* major course requirements for the degree with an overall cumulative quality point average (QPA) of not less than 2.00. Students transferring into the College of Commerce and Finance must attain a QPA of 2.0 or better for all work attempted at Villanova University.
- ? The final 30 hours of one's academic program must be completed at Villanova (residence requirement).
- ? Students are responsible for the degree requirements as determined for the class in which they would normally graduate. If they are formally readmitted to the College, they must meet the requirements of their new graduating class. Transfer students' degree requirements are determined at time of transfer.
- ? A student's eligibility for graduation is determined by the Dean. **NOTE: it is the personal responsibility of the student to meet all requirements for graduation.** The staff in the Dean's Office is available to assist the student in making this determination.
- ? Discharge of all financial obligations to Villanova University.

BASIC CURRICULUM

The curriculum outlined below provides a suggested sequence to complete the baccalaureate degree requirements. It incorporates some modifications based on particular majors. However, this suggested sequence should not be viewed as limiting since individual adjustments are made to meet desired educational objectives. For example, a student interested in continuing his/her study of a foreign language in freshman year would postpone either BL 1090, ENG 1010 and/or PHI 1050.

FRESHMAN YEAR

ACC 1001 ¹	Computer Applications in Accounting	3 crs.
BL 1090 ¹	Legal Environment of Business and Society	3
CHS 1000 ²	Ancient Medieval Renaissance Thought	3
CHS 1001 ²	Modern Thought: Enlightenment to Present	3
ECO 1001, 1002	Intro to Microeconomics/Macroeconomics	6
ENG 1010 ³	Composition	3
MAT 1330, 1335	Calc/Quan Ana Bus I, Calc/Quan Ana Bus II	6
PHI 1050 ^{3,4}	Intro to Philosophy	3

¹ Students in ACC 1001 in the Fall will take BL 1090 in the Spring and vice-versa.

² Students in CHS 1000 in the Fall will take CHS 1001 in the Spring and vice-versa.

³ Students in PHI 1050 in the Fall will take ENG 1010 in the Spring and vice versa.

⁴ A foreign language (Humanities Elective) can be substituted in freshman year for PHI 1050 for students who want to continue their foreign language study. PHI 1050 would then be taken in the junior or senior year. In addition, an Overload will be permitted for students interested in pursuing a foreign language.

SOPHOMORE YEAR

ACC 1101	Principles of Financial Accounting	<i>credits</i> 3
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College of Commerce and Finance

ACC 1102	Principles of Managerial Accounting	3
Social Science ⁵	Social Science Elective	3
CA 1100	Public Speaking	3
ENG 1050	The Literary Experience	3
ETH 2050 ⁶	Ethics of Tradition & Contemporary Life	3
HISTORY ^{6,7}	History Elective	3
MGT 2006	Information Systems for MGT	3
STA 2107, 2108	Intro to Statistics I/ II	6
THL 1050	Christianity: Tradition & Transitions	3

⁵ Social Science: Choose from Geography, Sociology, Political Science or Psychology.

⁶ Economics majors: Students who major in Economics will take two courses in their major (ECO 2101, Macro-Economic Theory - and ECO 2102 – Micro-Economic Theory) during their sophomore year. For these students, ETH 2050 is taken during the junior year, while a History course requirement is fulfilled during the senior year.

⁷ History: Choose from any offering from the Department of History.

JUNIOR YEAR

		<i>credits</i>
FIN 1113	Principles of Finance	3
MGT 1102	Organization & Management	3
MGT 1141	Operations Management	3
MKT 1137	Principles of Marketing	3
ECO Elective ⁸		3
Major courses		6
Natural Science ⁹		4
Non-Business Electives ^{10,11}		6

⁸ Economics Elective: Choose from ECO 2101, 2102 or ECO 3109. Economics Major take ETH 2050 in lieu of this elective.

⁹ Natural Science: Choose from AST, BIO, CHM or PHY with appropriate lab.

¹⁰ Accounting majors: Students majoring in Accounting take a third required accounting course during the junior year in place of a non-business elective course, which is taken during the senior year.

¹¹ MIS Majors: Substitute CSC 1051 for a non-business elective.

SENIOR YEAR

		<i>credits</i>	
Humanities Elective ¹³		3	
Major courses ¹⁶		9	
MGT 3301	Policy Formulation Administration	3	
Social/Natural Science ¹³		Elective	3
THL Elective		3	
Free Electives ^{14, 15}		9	

¹² Humanities: choose from Art History, Classical Studies, English, Modern Languages, Philosophy or Theater.

¹³ ECO majors: a history elective is substituted for a major course.

¹⁴ Social/Natural Science: choose from Geography, Political Science, Psychology, Sociology, or the Natural Sciences.

¹⁵ MIS Majors: a major course is substituted for a free elective.

¹⁶ ACC Majors: it is recommended that BL 2185 be substituted for one free elective.

ACADEMIC POLICIES AND INFORMATION

Unless otherwise noted, the College of Commerce and Finance follows the general university academic policies and regulations listed in the University section of this Catalog. *It is the responsibility of the student to know and comply with all academic policies and regulations of the University and of the College of Commerce and Finance. Such policies may change without prior notice.* Policies specific to the College follow:

ACADEMIC STANDING AND PROBATION

The academic records of all Commerce and Finance students will be reviewed at the end of each semester (including summer) by the Commerce and Finance Academic Standing Committee for appropriate action .

Any student falling below 2.0 QPA is automatically on academic probation and is subject to possible dismissal. Appropriate action is determined by the Committee on an individual basis and letters are sent at the end of each semester to the students being reviewed.

A student who is dropped from the College may appeal the decision by submitting additional information to the Committee. This must be done in writing before a specified date. *NOTE:* Student-athletes must meet the same criteria.

ADVISING

Students in the College of Commerce and Finance receive career and academic advising through the academic departments of their major either from the Chair or from an assigned faculty adviser. Freshmen (undeclared major) are advised by assigned faculty and peer student advisers. Freshmen advising is coordinated through the Business Law Department.

Advising is very important to Villanova faculty. During the semester, faculty members will be available to review tests and examinations, to assist students in understanding material in the course, and to discuss career opportunities in their field of specialty. Appointments with individual faculty members can be arranged with the department secretary or the instructor.

CLASSROOM EXPECTATIONS

Faculty members in the College of Commerce and Finance are expected to state on their syllabus at the beginning of each semester policies on such matters as academic integrity, class attendance, frequency of tests and examinations, use of notes and textbooks during examinations, submission and grading of written assignments, and the basis for determining the final grade.

COURSES AT OTHER INSTITUTIONS

Prior permission in writing must be obtained from the Dean of the College to transfer courses from other colleges and universities to Villanova. Courses must be equivalent to the Villanova course as to content, credit value and objective; and the grade must be a "C" or better. Credits only, and not quality points, are transferrable. Students must have a 2.0 QPA to apply for transfer of credit from other institutions.

FAILURE IN COURSES

When a student who has failed a course at Villanova presents evidence of subsequently passing an equivalent course in another institution, the right is reserved to withhold credit until the student passes a qualifying examination set by the department chair and dean of the college.

HONORS AND AWARDS

Awards for distinguished scholarship and service in the College are made annually at the Beta Gamma Sigma dinner. Other awards by professional organizations and departments are distributed on a regular basis at appropriate times.

College of Commerce and Finance

Beta Gamma Sigma. Beta Gamma Sigma is the national scholastic honor society in the field of business administration. Villanova's chapter is one of 157 from among 700 institutions offering undergraduate degrees in business. Each year qualified juniors, seniors, and recent graduates are eligible for membership in Beta Gamma Sigma.

Dean's List. A Commerce and Finance student achieves the Dean's List with a 3.50 semester average on his/her final grade report for the semester with full time status. The cumulative average does not apply.

ORGANIZATIONS

The objectives of collegiate education include proper social development and social leadership. Accordingly, Villanova University offers to the students a variety of extracurricular and co-curricular activities – religious, athletic, social and cultural. Student activities are under the jurisdiction of the Dean of Student Activities, the Dean's staff, and the Faculty Moderator of the individual organization. The College of Commerce and Finance sponsors the following organizations: Accounting Society, American Production and Inventory Control Society, Beta Gamma Sigma, Economics Society, Financial Management Association, Gamma Phi Honor Society, International Business Society, Marketing Society, Omicron Delta Epsilon – Economics Honor Society, Pi Sigma Epsilon (Marketing Profession Fraternity), Small Business Consultants, Association of Information Technology Professionals, and Society for the Advancement of Management.

SATISFACTORY/UNSATISFACTORY OPTION

Junior or Senior C & F students with a Quality Point Average of 2.5 or better may take free electives on a satisfactory/unsatisfactory basis. Only one satisfactory/unsatisfactory course may be taken per semester. The "S" grade is the equivalent of a "C" or better. The satisfactory/unsatisfactory grade will be shown on the transcript but will not be reflected in the quality-point average. Failures in the satisfactory/unsatisfactory option need not be repeated. *Note: a student must declare election of the satisfactory/unsatisfactory option by the end of the drop/add period at the office of the Registrar.*

SCHOLASTIC LOAD

A student must take a minimum of 12 and a maximum of 19 credits per semester to be a full-time student. Permission to take fewer than 12 hours or a course in excess of 18 credits may be obtained in exceptional circumstances with the approval of the Dean. No student may take more than one course overload in any semester. A 3.0 QPA is necessary for a student to be granted an overload with the exception of seniors who must have a 2.2 QPA.

TRANSFER CREDITS

Students planning to transfer to Villanova University's College of Commerce and Finance should review the section on Transfer Students appearing in this catalog. Note: transfer credits will not be granted for upper level professional courses if taken at the other institution at a freshman or sophomore level.

TUTORING

Gamma Phi Honor Society provides a tutoring service open to all C&F students. A list of available tutors in various courses is maintained in the office of the freshman adviser.

WITHDRAWAL FROM A COURSE (WX)

After the Friday following the mid-term break period, a student seeking to withdraw from a course without penalty must present to the Dean a written request with supportive evidence and recommendations from the course instructor and the instructor's department chairperson. The Dean of the College is the final authority for granting or refusing the exception on the basis of the documentation and recommendations submitted.

DEPARTMENTS

Villanova University

NOTE: In the courses listed below, the semester listings indicate which semester the course is offered. If there is no semester listing, the course is offered on an occasional basis only.

ACCOUNTANCY

Chair and Professor: Stout

Professors: Bremser, Clay (Emeritus), Derstine, Monahan

Associate Professors: Borden, Dougherty, Emig, Hildebeitel, Licata, O'Mara

Assistant Professors: Barsky, Catanach, Devine, Frank, Pelesh, Rhoades, Stiner, West

Office: 316 Bartley, tel. 519-4340

BACHELOR OF SCIENCE IN ACCOUNTANCY: The program is designed to provide academic preparation for those who seek employment in a wide-range of accounting, tax, and accounting-related areas. The program is also designed to provide a solid background for those individuals who intend to pursue graduate studies in business, law, or independent research. The program is separately accredited by the AACSB – the International Association for Management Education.

Certified Public Accountant Examination: Students planning to sit for the Uniform Certified Public Accountant (CPA) Examination are advised to contact the State Board of Accountancy in the state in which they plan to qualify for specific educational and experience requirements mandated by that state. For example, students who plan to become certified in the states of New Jersey or New York are required to take for credit an additional finance course beyond the single finance course (FIN 1113) required to complete the accounting major at Villanova University.

150 Hour Program: In January 1988, the general membership of the American Institute of Certified Public Accountants (AICPA) voted to require all new members after the year 2000 to have completed a minimum of 150 semester hours of college/university education. As of today, a majority of states have passed a 150-hour requirement for CPA certification purposes. In December of 1996, the State of Pennsylvania passed a new law that does not require 150 hours of education to sit for the Uniform CPA exam or to become certified in the State. What the Pennsylvania law did do, however, was reduce the experience requirement in half (one year versus two years for candidates who do not have a minimum of 150 credit hours of academic credit). For students entering with the class of 2000 and beyond, Villanova will provide three options for those students who wish to become eligible to sit for the CPA exam in those states that have a 150-hour requirement: enrollment in the College's MBA program, enrollment in the Master of Taxation program sponsored jointly by the College and Villanova University's Law School, or enrollment in a Master of Science in Accountancy program to be offered by the College.

Required courses for the major: ACC 2310, 2320, 2430, 2460, and 2470.

ACC 1001 Computer Applications and Accounting

Use of computer technology in managerial and financial accounting; spreadsheet and database applications, educational resources and the Internet, Web-page design, and presentation software. **(3 cr)**
Sem 1&2.

ACC 1101 Principles of Financial Accounting

Introduction to Financial Accounting, with a focus on financial statement analysis and the use of technology. **(3cr)** *Sem 1&2. Prereq: ACC 1001.*

ACC 1102 Principles of Managerial Accounting

Introduction to Managerial Accounting, including

the use of technology to facilitate managerial planning, control, and decision making. **(3 cr)**
Sem 1&2. Prereq: ACC 1001 & ACC 1101.

ACC 2310 Intermediate Accounting I Accounting principles applied to asset balance sheet valuation and financial statement presentation; current pronouncements and regulations of pertinent professional organizations and government regulatory bodies. Internet and web-based assignments. **(3 cr)** *Sem 1. Prereq: ACC 1102.*

ACC 2320 Intermediate Accounting II A continuation of ACC 2310: application of accounting principles to income determination and financial statement presentation; valuation of liabilities and equities; issues regarding financial statement analysis. Internet and Web-based assignments. **(3 cr)** *Sem 2. Prereq: ACC 2310.*

ACC 2430 Auditing Generally accepted auditing standards employed in verification of financial statements, evaluation of internal controls, statistical sampling, procedural testing, and professional standards of ethics. Includes appropriate use and application of computer technology. **(3 cr)** *Sem 2. Prereq: ACC 2320 and senior standing.*

ACC 2450 Advanced Accounting Theories and techniques used for specialized accounting problems, with emphasis on partnerships, business combinations, consolidations, multi-national corporations, not-for-profit entities, and issues related to solvency and liquidation. Writing-enriched course. **(3 cr)** *Sem 1. Prereq: ACC 2320.**

ACC 2460 Federal Income Tax Introduction to income tax law, including determination of

deductions and taxable income. Emphasis on tax planning, including choice of business entity and cash flow impacts. **(3 cr)** *Sem 1. Prereq: Senior standing.*

ACC 2470 Cost Accounting, Analysis and Control Introduction to product costing and the accounting information needs of managers, including: costing approaches (job-order, process, standard, and absorption); cost behavior analysis and cost estimation; differential costs for decision-making; activity-based costing and activity-based management; performance evaluation; and, issues related to quality. Group work and case analyses (including oral presentations). Writing enriched course. **(3 cr)** *Sem 1. Prereq: ACC 1102 and junior or senior standing.*

ACC 2480 Advanced Taxes Advanced federal income tax problems and issues as they pertain to individuals, partnerships, corporations, and estates and trusts. Emphasis on tax planning, including use of appropriate computer software. **(3 cr)** *Sem 2 Prereq: ACC 2460 and senior standing.**

ACC 3430 Accounting Internship Employment with approved accounting firms and business organizations; varied auditing experience with appropriate training, instruction, and supervision. **(3 cr)**

Course does not fulfill the requirements for major. *Sem 2 Prereq: Accounting major with junior or senior standing, a minimum QPA of 2.5, approval of the Chair and the Director of Business Relations. Satisfactory/unsatisfactory only. Paper required.**

*Elective courses.

Villanova University

BUSINESS LAW

Chair and Associate Professor: Ward

Associate Professors: Kuhn, Rainone, Rongione, Walsh

Assistant Professors: Cerino, DiLullo

Office: 327 Bartley, tel. 519-4360

Business Law provides the student with an understanding of individual legal responsibilities arising from the interaction of persons, property and government, and creates an awareness of the legal environment of business. Students who plan to apply for admission to a school of law may arrange for pre-legal curricular counseling through the chair of the Business Law Department.

BL 1090 The Legal Environment of Business and Society

The sources, nature and substantive principles of American Law; its moral and ethical dimensions; the judicial process; comparison with other legal systems; impact of government regulations both domestic and global. (3 cr) *Sem 1 & 2.*

BL 2100 Labor Legislation Modern legislation governing activities of employers and unions in labor disputes and relations between unions and their members; comparison with labor legislation internationally. (3 cr) *Sem 1. Prereq: Junior or senior standing.*

BL 2135 Business Associations and Commercial Transactions The law of agency, partnerships and corporations; personal property; the Uniform Commercial Code sections dealing with secured transactions and negotiable instruments; moral and ethical dimensions; comparison with other legal systems. (3 cr) *Sem 1. Prereq: Junior or senior standing.*

BL 2150 Real Estate-Principles and Practices Ownership, possession and management of land and

buildings; landlord and tenant, transfer of rights; title insurance; moral and ethical dimensions; comparison with other legal systems. (3 cr) *Sem 1&2.*

BL 2160 International Business Law Designed to explore the nature, sources, functions and practical applications of International Law, approached from a perspective of the individual, governments and business entities. Emphasis on the “rules” that govern doing business globally and resolving disputes. (3 cr) *Sem 1&2.*

BL 2185 The Law of Contracts and Sales Elements for legal agreements; Uniform Commercial Code Article 2; moral and ethical dimensions; comparison with other legal systems (3 cr) *Sem 1. Prereq: Junior or senior standing.*

BL 3160 Estate Planning Emphasis is placed on the use of estate planning principles in establishing estate objectives and plans, and the development of a faculty for using the tools of estate planning, including an awareness of ethical issues.

ECONOMICS

Chair and Professor: Mathis

College of Commerce and Finance

Professors: DeFina, Thanawala, Zech

Associate Professors: Clain, Donziger, Farrell, Giordano, Kroch, Wolnicki, Zaleski

Assistant Professors: Alexandrin, Asher, Casario, Mao, Matthews, Taylor, Walsh, Webster

Office: 342 Bartley, tel. 519-4370

BACHELOR OF SCIENCE IN ECONOMICS: The Economics major offers a challenging intellectual experience designed for those who intend to enter business, government, legal, or teaching professions. It offers sound training in economic theory and institutions which foster the ability to analyze the problems of business and society through use of modern quantitative methods. The curriculum for the Economics major combines grounding in fundamentals with the opportunity to pursue individual interests in the selection of advanced courses. Beyond ECO 1001 and 1002 taken in the Freshman year, the major requires 6 credits in micro and macro economic theory (ECO 2101, 2102) taken in the sophomore year and 12 credits chosen from the courses listed below, with course numbers 3000 and above.

BACHELOR OF ARTS IN ECONOMICS: Students in the College of Liberal Arts and Sciences who specialize in Economics earn the degree of Bachelor of Arts in Economics. Such students must take MAT 1330 (Quantitative Analysis for Business) either to satisfy their math requirement or as a free elective. They should take ECO 1001 and ECO 1002 as two of the three social science courses in the Sophomore year. In addition, students must successfully complete: ECO 2101, 2102; STA 2107, 2108; and 15 elective Economics credits.

MINOR: In order to earn a minor in Economics, students must take MAT 1330 (Quantitative Business Analysis) and complete a total of 18 credits consisting of ECO 1001, 1002, 2101, 2102, and 6 economics elective credits chosen from courses listed below, with course numbers 3000 and above.

ECO 1001 Principles of Microeconomics The price system; demand and supply analysis; the production process; analysis of market structures. (3 cr) *Sem 1&2.*

ECO 1002 Principles of Macroeconomics The economic system and its fundamental principles. The economic functions of government, monetary and fiscal policy, and international trade. (3 cr) *Sem 1&2.*

ECO 1103 The Economics of Social Issues Major economic and social problems facing the American economy: evaluation of the various policy alternatives for solving these problems. Topics include population, discrimination, environment, poverty and international trade. *Students may receive credit for either this course or ECO 1002, not both.* (3 cr).

ECO 1104 The Environment and the Economy Environmental problems and strategies to deal with them: environmental damage and economic growth;

pollution and technology; pollution; air, water, and solid waste disposal. (3 cr)

ECO 2101 Macro-Economic Theory The components of aggregate economic growth. Theories underlying public policies which attempt to achieve the objectives of price stability, full employment and economic growth in the United States. (3 cr) *Sem 1&2. Prereq: ECO 1001 and 1002.*

ECO 2102 Micro-Economic Theory Economic and mathematical analysis of the equilibrium conditions of the household, the firm, and industry, in various market structures, together with a brief examination of the general equilibrium of the economy; emphasis upon developing a working knowledge of elementary mathematical analysis as it applies to present economic theory. (3 cr) *Sem 1&2. Prereq: ECO 1001 and 1002.*

ECO 2110 Problems of the American Economy Alternative policy choices facing the American

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economy analyzed within the context of the total economic system; the impact of inflation, unemployment, international trade and payments, etc., on business enterprises, the implication of the American tax system; the causes of fluctuations in the level of economic activity. **(3 cr)** *Sem 1&2. Prereq: ECO 1001 and 1002, or consent of instructor. Open to Economics Majors and Minors as a non-economics, free elective only.*

ECO 3106 Economics of Money and Banking Principles of money, banking and financial markets; the relationship of the monetary and banking system to the functioning of the economy; the theory and practice of monetary policy; the function of money in international payments. **(3 cr)** *Sem 1&2. Prereq: ECO 1001 and 1002.*

ECO 3109 International Economics Comparative advantage; gains from foreign trade; Heckscher-Ohlin doctrine; technology and product cycles; tariff theory and policy; Other protection measures; economic integration; foreign exchange rates; fixed and flexible rates; balance of payments; multinational corporations. **(3 cr)** *Sem 1. Prereq: ECO 1001 and 1002.*

ECO 3111 History of Economic Thought The evolution of economic analysis within the context of contemporary economic institutions and associated social, ethical, and political thought. This is a writing enriched course. **(3 cr)** *Sem 2. Prereq: ECO 1001 and 1002.*

ECO 3112 Public Finance The economic role of government and the theory and practice of public expenditure and taxation. Government's impact on the allocation of resources and the distribution of income in a mixed economy. Topics include economic welfare, public expenditure analysis, tax incidence, public choice analysis, cost-benefit analysis. **(3 cr)** *Prereq: ECO 1001.*

ECO 3115 Alternative Economic Systems Presentation, comparative analysis and discussion of the structure, performance, efficiency and growth aspects of various economic systems. *This is a writing enriched course.* **(3 cr)** *Sem 1. Prereq: ECO 1002.*

ECO 3118 Women and the Economy The role of women in the economy and its implications. Economics of the household, marriage, fertility, divorce, unemployment, earnings of women and occupational choice. International comparisons and current public policy issues. **(3 cr)** *Sem 2. Prereq: ECO 1002.*

ECO 3123 Labor Economics Economic theories concerning the employer's labor demand, the individual's labor supply, educational/occupational choices, labor unions, on-the-job training, discrimination, labor market mechanisms and wage determination. Public policies which affect the market. **(3 cr)** *Sem 1. Prereq: ECO 1002.*

ECO 3125 Industrial Organization and Public Policy Economics of American industrial organization; market structure, conduct, and performance; the workability of competition in selected industries; the application of public policy and anti-trust law. **(3 cr)** *Sem 1. Prereq: ECO 1001.*

ECO 3126 American Economic Development Growth of the American economy in terms of its various sectors and their interrelations; the evolution of important economic institutions and ideas and of the role of the entrepreneurs. *This is a writing enriched course.* **(3 cr)** *Prereq: ECO 1001.*

ECO 3127 Development Economics Structural change in the process of development; growth patterns and income distribution; determinants and role of saving, investment, technological change; strategy and methods of development planning; the role of government; social institutions. *This is a writing enriched course.* **(3 cr)** *Sem 2. Prereq: ECO 1002.*

ECO 3128 Introduction to Mathematical Economics Variables and functions, matrices and determinants, difference equations, and calculus. Applications to economic and business problems, including market equilibrium, revenue and cost functions, marginal theory, maximization problems, input-output analysis, and selected deterministic models. **(3 cr)**

Sem 1. Prereq: ECO 1001 AND 1002 and one-year college level course in the fundamentals of mathematics.

ECO 3135 Case Studies in American Industry

Structure and conduct of selected industries in the U.S. Economy chosen from the manufacturing, finance, energy, public utility, and transportation sectors. Effects of government policies such as regulation, deregulation, antitrust, subsidization, and protection from foreign competition. *This is a writing enriched course. (3 cr) Sem 2. Prereq: ECO 1001.*

ECO 3137 Introduction to Econometrics

Intermediate course in stochastic methods with emphasis on applications; estimation, hypotheses testing, regression analysis, economic forecasting, time series analysis and probabilistic formulation of economic relationships such as consumption and production functions. **(3 cr) Sem 1. Prereq: ECO 1001 and 1002, STA 2108.**

ECO 3141 Urban Economics Economic structure of urban areas and problems associated with it; growth of urban areas; urban and suburban economic interdependence, finances, tax base and burden, urban poverty, social welfare, housing and transportation problems. *This is a writing enriched course. (3 cr) Sem 2. Prereq: ECO 1001 AND 1002.*

ECO 3150 Collective Bargaining Union-management relations in the American economy; development and impact of collective bargaining examined from economic and public policy viewpoints; its relation to the administrative decision-making process. **(3 cr) Prereq: ECO 1001.**

ECO 4132 Seminar in Economics Capstone course requiring students to utilize the tools of analysis and expression, including not only economic theory and applications, but also writing, speaking and mathematics. Computer skills expanded. *This is a writing intensive course. (3 cr) Sem 1&2. Prereq: ECO 2101, 2102 & STA 2108*

ECO 4200, 4300 Topics in Economics Selected topics in economics currently of interest to faculty and students. **(3 cr) Sem 1&2. Prereq: ECO 1001 and 1002, or consent of instructor.**

ECO 4500 Independent Study in Economics

Students with specific interests work on a tutorial basis with faculty. A departmental independent Research Proposal form must be approved by the directing faculty member and the department chairman prior to registration. **(3 cr) Sem 1&2. Prereq: senior standing and consent of chair.**

STA 2107 Introduction to Statistics I Descriptive statistics, elements of probability, distributions including the binomial, Poisson, hypergeometric and normal; Bayesian inference and sampling distributions; confidence intervals; index numbers; use of statistical methodology to solve business problems. **(3 cr) Sem 1&2. Prereq: a college level course in the fundamentals of mathematics.**

STA 2108 Introduction to Statistics II Estimation techniques, hypothesis testing, correlation and regression analysis employing computer applications, time series analysis, analysis of variance, and non-parametric methods, application of statistical techniques. **(3 cr) Sem 1&2. Prereq: STA 2107.**

FINANCE

Chair and Associate Professor: McWilliams

Professor: Lamm-Tennant, Nawrocki

Associate Professors: Clarke, Cochran, Dellva, Heck, LeClair, Olson

Assistant Professors: DeMaskey, Howton

Office: 341Bartley, tel. 519-7395

The Finance major is designed for those students interested in domestic and international business finance, financial institutions, and investments. The curriculum also provides a solid foundation for individuals interested in pursuing post graduate study in business and law. All finance majors are required to take designated courses in Advanced Financial Management, Financial Markets, and Investments. In addition, elective courses are selected from other offerings in the Finance Department with the exception of Finance Internship and Independent Study.

MAJOR: FIN1113 plus 15 credits including FIN 2227, 2323, and 2114 and 6 credits from other department course offerings except FIN 3350 and 3360.

MINOR: FIN 1113 plus 9 credits from other Finance course offerings except FIN 3350 and 3360

FIN 1113 Principles of Finance The theory and techniques of financial management. Time value of money; risk and return; financial analysis and planning; working capital management, capital budgeting; cost of capital; strategic long term financing decisions. **(3 cr)** *Sem 1&2. Prereq: ACC 1102 and junior or senior standing.*

FIN 2114 Advanced Financial Management Risk and return relationships; valuation models; cost of capital; capital structure; capital budgeting; dividend policy; international financial transactions; financial statement analysis and forecasting; working capital management. **(3 cr)** *Sem 1&2. Prereq: FIN 1113 and junior or senior standing.*

FIN 2227 Financial Markets An introduction to the structure and operation of the money, capital, mortgage, derivatives, and international financial markets; flow of funds from savers to borrowers; efficiency of financial markets; theories of interest rates; term structure of interest rates. **(3 cr)** *Sem 1&2. Prereq: ACC 1102 and junior or senior standing.*

FIN 2230 Financial Institutions The structure, operation, management, and regulation of commercial banks, savings and loan associations, mutual savings banks, credit unions, insurance companies, finance companies, pension funds, investment companies, and international financial institutions; structure and operation of the Federal Reserve system; measurement and management of the risks of financial institutions. **(3 cr)** *Sem 1&2. Prereq: FIN 1113 and junior or senior standing.*

FIN 2323 Introduction to Investments Risk and return; organization of securities markets; term structure of interest rates; valuation of bonds; bond trading; valuation of common stock using fundamental and technical analysis; options, warrants, and financial futures; real estate; precious metals. **(3 cr)** *Sem 1&2. Prereq: FIN 1113 and junior or senior standing.*

FIN 2324 Portfolio Management Advanced investment management with an emphasis on portfolio management; forecasting economic conditions; risk-return characteristics of securities;

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asset allocation (optimization) techniques; selecting investment goals; evaluating portfolio performance; international diversification; portfolio management with options and futures; computer applications in investment management. **(3 cr)** *Sem 1&2. Prereq: FIN 2323 and senior standing.*

FIN 2335 International Financial Management

The financial operations of multinational corporations and financial institutions with an emphasis on the international financial environment, foreign exchange risk management, multinational working capital management, foreign investment analysis, financing foreign operations, and international banking. **(3 cr)** *Sem 1&2. Prereq: FIN 1113 and junior or senior standing.*

FIN 2340 Contemporary Topics in Finance

Contemporary issues and topics in Financial Management, Financial Markets, Investments, or

International Finance. **(3 cr)** *Sem 1&2. Prereq: FIN 1113 and junior or senior standing.*

FIN 3350 Finance Internship Employment with an approved firm in the area of Finance where experience is gained with appropriate training, instruction, and supervision. Course does not fulfill the requirements for major. **(3 cr)** *Sem 1&2 and summer. Prereq: Finance major with junior or senior standing, a minimum QPA of 2.5, approval of the Chair and the Office of Business Relations.*

FIN 3360 Independent Study-Finance Independent study under a faculty member's guidance in an area of special interest to the student. The area of interest must be discussed with the faculty member prior to registration. **(3 cr)** *Sem 1&2. Prereq: Senior Finance majors.*

Villanova University

MANAGEMENT

Chair and Professor: Najdawi

Professors: Liberatore, Pearce, Wolek

Associate Professors: Burke, S. Chaudhry, Hopeman, Nydick, Sipior, Varano

Assistant Professors: Arvanites, P. Chaudhry, Fitzpatrick, Klingler,

Otto, Rusinko, Tymon, Wagner

Office: 323 Bartley, tel. 519-4395

The Department of Management offers a major in Management and a major in Management Information Systems, "MIS". The Management major prepares students for success after graduation in either the pursuit of further study in Business or Law, or their entry into the business world. All Management Majors must complete specific courses in the areas of: Organizational Behavior, International Business, Systems Analysis and Design and two Elective courses from such fields as: Operations Research, Management Practice, Small Business Management, Human Resource Management, and International Comparative Management.

The MIS Major prepares students to better understand and utilize information technology in the Management and Operation of Business Organizations. All MIS majors must complete specific courses in Computer Programming, Database Management Systems, Systems Analysis and Design, Data Communications and Networking, and Applied Decision Support Systems.

MGT MAJOR: MGT 2155, MGT 2410, MGT 2165, and two (2) MGT Electives.

MIS MAJOR: CSC 1051, MGT 2165, MGT 2170, MGT 2175, MGT 2180 and MGT 2185

MIS MINOR: CSC 1051, MGT 2165, MGT 2170, and MGT 2175 (*All courses Required*)

MGT 1006 Microcomputer with Applications

Provides students with necessary background and skills to understand and use microcomputers. Topics include operating system, windows, spreadsheets, and word processing. **(1 cr)** *Pass/Fail; Sem 1&2.*

MGT 1102 Organization and Management

Introduction to organizational structures and functions; management processes and behavior of individuals and groups in organizations. **(3cr)** *Sem 1&2. Prereq: junior or senior standing.*

MGT 1141 Operations Management Concepts and techniques for problems in manufacturing and service organizations. Topics: decision making, forecasting, resource allocation, project management, quality, materials management, technology, and strategy. **(3 cr)** *Sem 1&2.*

Prereq: STA 2108 and junior or senior standing.

MGT 2006 Information Systems for Management

Structure and applications of computer-based Management Information Systems in organizations. Topics: impact of information technology on organizations, ethical issues, technical foundations of hardware/software, management of data, and telecommunications. **(3 cr)** *Sem 1&2. Prereq: MGT 1006.*

MGT 2150 Operations Planning and Control

Concepts and techniques for problems in production, planning and scheduling, inventory control and maintenance management. **(3 cr)** *Sem 2. Prereq: MGT 1141 and junior or senior standing.*

MGT 2153 Introduction to Human Resources Management Role of Human Resources

Management in corporate strategy and success. Staffing, compensation, work design, performance measurement, individual and career development, safety, health, and separation. Focus on HR as critical success factor in organizations. (3 cr)

Sem 2. Prereq: junior or senior standing, MGT 1102 or permission of the instructor.

MGT 2155 Organizational Behavior Human behavior in organizations; research and theoretical writing on organizational behavior; case discussions. (3 cr) *Sem 2. Prereq: MGT 1102 and junior or senior standing.*

MGT 2160 Introduction to Decision Sciences Integrate behavioral science and quantitative approaches to decision-making; descriptive and prescriptive models in individual, group, and organizational settings, expected value, utility theory, the analytic hierarchy process, and risk analysis. (3 cr) *Sem 2. Prereq: MGT 1141 and junior or senior standing*

MGT 2165 Systems Analysis and Design This course includes tools and techniques used to document information systems. Classical and structured methodologies for describing data flow, data structure, process flow, file design, input and output designs, and program specifications are applied to documenting systems. Data gathering and reporting, project management, and cost/benefit analysis are surveyed. (3 cr) *Sem 1. Prereq: MGT 2006 and junior or senior standing.*

MGT 2170 Database Management Theoretic and practical issues related to the management of a database in a business environment including: the role of databases and database applications in contemporary organizations; data modeling using the entity-relationship and semantic object models; fundamentals of the relational data model and its implementation along with SQL; and characteristics of distributed databases and Client/Server database technologies. (3 cr)

MGT 2175 Applied Decision Support Systems Computer-based decision analysis and support models in a business environment. Potential topics include: decision analysis and support; group

decision support systems; and intelligent support systems. (3 cr)

MGT 2180 Data Communications Data communication technologies to support the effective and efficient management of information in an organization. Topics will include: the different competing data communication architectures and protocols; an overview of different network topologies and technologies such as LAN, WAN, intranets, and Value-added networks. (3 cr)

MGT 2185 Advanced Topics in MIS State-of-the-art topics in information technology. Possible topics include: expert systems and applied artificial intelligence, advanced networks, etc. (3 cr)

MGT 2206 Management Practice Application of management theory to problem identification and solutions. Motivation, leadership, discipline and shaping organizational cultures. Emphasis on jobs and the work students will enter after graduation. (3 cr) *Sem 2. Prereq: MGT 2155 and junior or senior standing.*

MGT 2210 Small Business Management The environment and significance of small business in the economy, entrepreneurship, and factors leading to success or failure. Extensive interviews with entrepreneurs, writing a business plan, consulting for local small business through Small Business Institute. (3 cr) *Sem 1. Prereq: senior standing.*

MGT 2341 Operations Research Techniques of operations research for business application; topics: mathematical programming, decision analysis, waiting lines, and simulation. (3 cr) *Sem 1. Prereq: MGT 1141 and junior or senior standing.*

MGT 2350 International Comparative Management An elective topic dealing with the cross-cultural aspects of management. Student cases will address how politics, religion, social customs, and history shape and influence management practices. (3 cr) *Sem 2. Prereq: MGT 1102 and junior or senior standing.*

MGT 2410 Introduction to International Business Introduces students to international business

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environment by providing managerial understanding of the marketing, finance, and cross-cultural disciplines. Supplemented with cases, the course is designed to explore ways to collect international information through on-line databases. **(3 cr)** *Sem 1. Prereq: junior or senior standing.*

MGT 3301 Policy Formulation and Administration

Strategic management of organizations. Strategic planning and cross-functional decision making. Lecture, case analysis, and computerized business simulations are employed. **(3 cr)** *Sem 1&2. Prereq: MGT 1102, 1141, FIN 1113, MKT 1137 and senior standing.*

MGT 3305 International Study Tour Class work, enrichment activities and projects at a selected international academic institution, including visits to businesses in the surrounding region. Three week requirements include a comprehensive research paper worthy of publication. **(3 cr)** *Prereq. MGT 2206.*

MGT 3310 Business Administration Internship

Employment with approved business firms where various meaningful assignments are performed with appropriate training, instruction, and supervision. **(3 cr)** *Sem 1&2. Prereq: B.A. Major, junior*

standing with 3.0 cumulative average.

MGT 3320 Independent Study-Administrative Science

Study with faculty member's guidance in area of special interest to student. **(3 cr)** *Sem 1&2. Prereq: Management senior; faculty member approval prior to registration.*

MGT 3330 Independent Study-Operations Management

Study with faculty member's guidance in area of special interest to student. **(3 cr)** *Sem 1&2. Prereq: Management senior; faculty member approval prior to registration.*

MGT 3340 Independent Study-International Business

Study with faculty member's guidance in area of special interest to student. **(3 cr)** *Sem 1&2. Prereq: Management senior; faculty member approval prior to registration.*

MGT 3350 Independent Study in Small Business

The environment and significance of small business in the economy. Problems in starting a small business and factors that contribute to success or failure. **(3 cr)** *Sem 1&2. Prereq: Management senior; faculty member approval prior to registration.*

MARKETING

Chair and Associate Professor: Bonner

Professors: George, Sanchez

Associate Professors: Schmitt, Taylor

Assistant Professors: Bang, Ellinger, O'Neill

Office: 340 Bartley, tel. 519-4350

The Marketing major focuses on a systematic and analytic study of the marketing process for goods and services in consumer, industrial, governmental, and international markets, with particular emphasis on the development and implementation of products, pricing, promotion, and physical distribution programs. All marketing majors must complete specific courses in the areas of marketing research and marketing management, along with electives from such fields as advertising management, buyer behavior, business-to-business marketing, international marketing, marketing of services, retailing management, and sales management.

MAJOR: MKT 1137, 2197, 2375 and 3 Marketing electives.

MINOR: MKT 1137 plus three (3) other MKT courses, one of which must be either MKT 2120 or 2197. Graduates of the Summer Business Institute may also minor in Marketing, with the same requirements.

MKT 1137 Principles of Marketing Description and evaluation of the ways in which goods and services are developed to meet customer and consumer needs and distributed for domestic and international consumption; economic, government, social, and other environmental forces in relation to the marketing function; emphasis on relevant social problems and responsibilities. **(3 cr)** Sem 1&2; *Prereq: junior or senior standing.*

MKT 2120 Buyer Behavior Consumer orientation in the development and attainment of organizational goals within the framework of human behavior and its relationship to the field of marketing. Theory from psychology, sociology, and social psychology, with an emphasis on application to marketing problems in consumer and industrial environments. **(3 cr)** Sem 1; *Prereq: MKT 1137, 2197 and junior or senior standing.*

MKT 2197 Marketing Research The principal internal and external procedures used in collecting, processing, and evaluating both quantitative and qualitative data; research design; management of information for decision making. **(3 cr)** Sem 2; *Prereq: Sta. 2108 and junior or senior standing.*

MKT 2220 Advertising Management Management of advertising within business firms and nonprofit organizations; production of advertisements for various media; role of the advertising agency; analysis of the impact of economic, market, ethical, and government factors on the advertising function. **(3 cr)** Sem 2; *Prereq: MKT 1137 and junior or senior standing.*

MKT 2225 Sales Management Policies and procedures for managing a sales organization; the role and characteristics of the personal selling function; techniques for selecting, training, supervising, and evaluating salespeople; ethical and legal considerations in sales force management. **(3 cr)** Sem 1&2; *Prereq: MKT 1137 and junior or senior standing*

MKT 2230 Marketing of Services Application of marketing principles to service organizations; differences between goods and services marketing and how these differences influence marketing strategy and the tactical design of the marketing mix variables. **(3 cr)** Sem 2; *Prereq: MKT 1137 and junior or senior standing.*

MKT 2277 Channel Structures and Institutions Channel structure and institutional theory at both the domestic and international levels, using selected topics in economics, sociology, psychology, statistics, and marketing. Time series forecasting techniques as they relate to inventory management throughout the channel. **(3 cr)** Sem 1&/or 2; *Prereq: MKT 1137 and junior or senior standing.*

MKT 2280 International Marketing and Trade The world market and its implications for multinational and international marketing; the relationships of imports and exports to policies; impacts of major national cultures on foreign advertising and sales programs will be researched through multidimensional sources. **(3 cr)** Sem 1&2; *Prereq: MKT 1137 and junior or senior standing.*

MKT 2375 Marketing Management Analytic procedures to understand and integrate effective policies applied to demand, product research, channel selection and development, promotion, and pricing on both domestic and international levels; concentration on decision making. **(3 cr)** Sem 1; *Prereq: MKT 1137, and senior standing.*

MKT 2349 Contemporary Topics in Marketing Contemporary issues and topics which affect a firm's marketing strategies. **(3 cr)** *Prereq: MKT 1137 and Junior or Senior standing.*

MKT 3350 Independent Study-Marketing Independent study under faculty guidance in an area of student's special interest. **(3 cr)** Sem 1&2; *Prereq: Senior standing; approval of faculty member before registration.*

Villanova University

MKT 3450 Marketing Internship Employment with approved firm where varied marketing experience is gained with appropriate training, instruction and supervision. **(3 cr)** *Sem 1,2 & Summer. Course does not fulfill the requirements*

for the Marketing major. Prereq: Marketing major with junior/senior standing, 2.5 QPA, and approval of the Chair and the Director of Business Relations.

COLLEGE OF ENGINEERING

Robert D. Lynch, Ph.D., Dean
Lynda A. Capuzzi, BCE, Assistant Dean

“Analysis and practical creativity do not preclude emotional fulfillment; they are pathways to such fulfillment. They do not *reduce* experience, as is so often claimed; they *expand* it. At the heart of engineering lies existential joy”

THE CIVILIZED ENGINEER by Samuel C. Florman

HISTORY

The first engineering students were enrolled at Villanova University in the fall term of 1905. Four years later in 1909, the first degrees were awarded: two in Civil and one in Electrical Engineering. During the next ten years, programs in Chemical and Mechanical Engineering were added.

In the period of 1953 through 1960, graduate programs in Chemical, Civil, Electrical, and Mechanical Engineering were instituted. During the same period, evening undergraduate programs in Electrical and Mechanical Engineering were also added. In 1993, an undergraduate program in Computer Engineering was established.

OBJECTIVES

The College of Engineering is committed to providing a modern, relevant, high quality education that prepares its graduates to understand their role in today’s and tomorrow’s technological society, to make constructive engineering contributions, and provide ethical leadership to the engineering profession. The College pursues these objectives by stressing:

- ? The integration of the morality and values of the University’s Augustinian heritage into the engineering curriculum.
- ? Faculty development by participation in high quality research which contributes to the body of knowledge used by the engineering profession.
- ? Emphasis on the engineering design process in order to motivate, stimulate, and educate students. In this approach, the problem solved or the need met is less important than the design process used to develop an optimum solution.
- ? A spirit of mutual respect, pride, confidence and cooperation among the engineering faculty, students, and graduates in their pursuit of knowledge and wisdom.

The undergraduate program seeks to develop the following specific attributes in all graduates:

- ? An ability to apply scientific and mathematical concepts and principles to solve problems in real-world situations.
- ? A fundamental understanding of mathematics, physical sciences and the scientific method.
- ? An ability to identify and define a problem, develop and evaluate alternative solutions, and effect one or more designs to solve the problem.
- ? An effectiveness in communicating ideas and information.
- ? A motivation and capability to acquire, evaluate, and assimilate knowledge and continue the learning experience.
- ? High professional and ethical standards.
- ? An ability to use computers for communication, analysis and design.
- ? An ability to be an effective member of a project team.
- ? An appreciation of the interrelationships of people within society and the role of the individual in society.
- ? An appreciation of humanistic concepts in literature, the arts and philosophy.

DEGREES OFFERED

The College of Engineering offers full-time (day) academic programs leading to the following degrees: Bachelor of Chemical Engineering, Bachelor of Civil Engineering, Bachelor of Computer Engineering, Bachelor of Electrical Engineering, and Bachelor of Mechanical Engineering.

The undergraduate engineering programs offered by Villanova University are fully accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

DEGREE REQUIREMENTS

The undergraduate engineering curriculum provides the foundation for careers in engineering as well as the basis for further study in engineering and other professions such as law, medicine, and management. The first two years of study concentrate on mathematics, physics, chemistry, and engineering science, while the last two years stress engineering analysis and design within a particular engineering discipline.

The curriculum places special emphasis upon developing oral and written communication skills, and it offers opportunities to develop an appreciation of the social sciences and humanities, and flexibility to pursue minors. Courses in the humanities are included in each curriculum to make the student engineer more fully aware of social responsibilities and better able to consider non-technical factors in the engineering decision making process. Extensive hands-on laboratory experience leads to required independent study projects for all seniors to ensure professional preparation in the fundamentals of the design process within the real constraints of problem solving.

In order to qualify for a Bachelor's Degree in the College of Engineering, undergraduate engineering students must successfully complete all of the first year **core curriculum** courses, those **major** courses required for the particular engineering degree sought, and a series of **electives**, as indicated in the following sections. They must also achieve cumulative overall and technical grade point averages of at least 2.00 in their course work.

At least half of all the engineering courses and, normally, the final 30 credits of an engineering bachelors degree program, must be taken at Villanova University. All undergraduate degree requirements should normally be completed within a six-year period. *NOTE: It is the responsibility of each student to know and to fulfill all degree requirements. In order to keep the curriculum abreast of the latest engineering developments, Villanova University reserves the right to change the program requirements without prior notice.*

CORE CURRICULUM

FRESHMAN YEAR

College of Engineering

<i>First Semester</i>		<i>Credits</i>
CHM 1151	General Chemistry	4
CHM1103	General Chemistry Laboratory I	1
CHS 1000 ¹	Ancient Medieval and Renaissance Thought	3
EGR 1611	Engineering Analysis	3
MAT 1500	Mathematical Analysis I	4
THL 1050	Christianity: Traditions and Transitions	3

<i>Second Semester</i>		<i>Credits</i>
CHM 1152	General Chemistry II	4
CHS 1001 ¹	Modern Thought: Enlightenment to Present	3
EGR 1610	Engineering Design Graphics	3
MAT 1505	Mathematical Analysis II	4
PHY 2400	Physics I, Mechanics	3

¹ NOTE: This course may be taken in either semester.

DECLARATION OF MAJOR

All engineering students are enrolled in a common freshman year curriculum. Prior to the end of their freshman year all undergraduate engineering students are required to *declare their major field of study*, i.e., Chemical, Civil, Computer, Electrical, or Mechanical Engineering.

Engineering *students who wish to change their major* within the College of Engineering must make this request in writing to the Dean of Engineering. Engineering students who wish to change their major to an area outside of engineering must apply for admission to the Dean of the College offering that program.

DEGREE PROGRAMS

BACHELOR OF CHEMICAL ENGINEERING

The chemical engineer typically uses the principles of mathematics, chemistry, physics and engineering sciences to solve creatively technical and commercial problems arising in industries which manufacture products by chemical reactions. These solutions must respond to economic constraints as well as social, ethical and safety implications. The chemical engineer may also apply these principles in related fields where the management of chemical transformations is important, such as preservation of the environment, bio-engineering or the creation of new medical technology. Finally, the chemical engineer can apply understanding of fundamental principles to fields that interact indirectly with chemical technology, such as industrial management and patent law.

The early years of the chemical engineering curriculum emphasize the basic principles of natural and engineering sciences. Later courses use these principles to develop skill in chemical engineering design -- the solving of non-routine, open-ended problems requiring the exercise of judgment, and constrained by economic, safety, reliability or other requirements. Courses gradually develop the students' abilities, with the complexity of design experiences systematically increasing throughout the required courses in chemical engineering science, and culminating in the senior process design course.

Technical electives in the junior and senior years allow the student to tailor the program toward career goals. In the senior year, the student develops the ability to work independently by carrying out a chemical engineering project. All stages of the curriculum apply computers in various modes, ranging from programming personal computers for the solution of simple problems, through the use of computers for process monitoring and control, to the use of sophisticated software packages for process design.

The curriculum includes several technical electives, to be chosen from a list of approved courses under the guidance of a faculty member designated as the student's academic adviser. At least three of these electives must

emphasize advanced chemical engineering fundamentals and design. The student must also elect at least one in another engineering discipline, but no more than two courses outside the Chemical Engineering Department, as described in the guidance manual. (A copy of the guidance manual which lists acceptable elective courses and describes the advising process is available from the CHE academic advisers or from the department).

Program of Studies

SOPHOMORE YEAR

<i>First Semester</i>		<i>Credits</i>
CHE 2041	Chemical Process Calculations	4
CHE 2011	Introduction to Chemical Engineering	1
CHM 3411	Physical Chemistry I	3
CHM 3401	Physical Chemistry Lab I	1
MAT 2705	Differential Equations with Linear Algebra	4
PHY 2402	Physics II: Electricity and Magnetism	3
Elective	Humanities/Social Science	3

<i>Second Semester</i>		<i>Credits</i>
CHE 2032	Chemical Engineering Thermodynamics I	3
CHE 2232	Fluid Flow Operations	3
CHE 2022	Statistical Methods of Data Analysis	2
CHE 2122	Numerical Methods in Differential Equations	2
CHM 3412	Physical Chemistry II	3
CHM 3402	Physical Chemistry Lab II	1
PHY 2403	Physics Lab for Engineering	1
Elective	Humanities/Social Science	3

JUNIOR YEAR

<i>First Semester</i>		<i>Credits</i>
CHE 3031	Heat Transfer Operations	3
CHE 3131	Chemical Engineering Thermodynamics II	3
CHE 3921	Chemical Engineering Lab I	2
CHE 4811	Professional Development	1
CHM 2211	Organic Chemistry I	3
CHM 2201	Organic Chemistry Lab I	1
Elective - Technical	3
Elective- Humanities/Social Science	3

<i>Second Semester</i>		<i>Credits</i>
CHE 3032	Principles of Mass Transfer	3
CHE 3232	Dynamic Simulation and Control Applications	3
CHE 3922	Chemical Engineering Lab II	2
CHM 2212	Organic Chemistry II	3
CHM 2202	Organic Chemistry Lab II	1
Elective - Technical	3
Elective - Humanities/Social Science	3

SENIOR YEAR

<i>First Semester</i>		<i>Credits</i>
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College of Engineering

CHE 4131	Process Equipment Design	3
CHE 4911	Chemical Engineering Lab III	1
CHE 4831	Chemical Engineering Project	3
CHE 5131	Chemical Reaction Engineering	3
Elective	Technical	3
Elective	Humanities/Social Science	3

<i>Second Semester</i>		<i>Credits</i>
CHE 4812	Seminar	1
Electives	Technical	9
Elective	Humanities/Social Science	3
Elective	Free	3

BACHELOR OF CIVIL ENGINEERING

Civil Engineers are involved in the planning, design, construction, and operation of facilities essential to modern life such as dams, bridges, highways, buildings, airports, harbors, river and shore protection, clean water supplies, treatment and disposal of wastes, offshore structures, and space platforms. Because these projects are often of a magnitude which affect large segments of the population, the responsibility of the civil engineer extends beyond mere physical facilities into the social, political, and economic welfare of those they serve.

The civil engineering program prepares men and women confidently to enter the profession as well as to continue into graduate level studies. Emphasis is placed on recognizing societal needs and creative problem solving to meet those needs. The curriculum develops the concept of design coupled with engineering judgement, enhances communication skills, and stresses computer fluency. The broad-based curriculum permits all students to take at least one course in five traditional civil engineering areas - structural analysis and design, transportation, hydraulics and hydrology, geotechnical, environmental - but also provides flexibility and meets student needs through a selection of electives in the junior and senior years. Under special circumstances, and with the approval of the student's adviser and chairperson, a course taken outside the department may be substituted for the Civil Engineering Elective. Total credits to earn the degree are 136.

Design concepts and methodology are integrated throughout the curriculum culminating in a year-long senior level major comprehensive design experience. This team approach design project includes the solution of open-ended problems, normally incorporates multiple specialty areas of civil engineering, and includes some practitioner involvement. Social, political, ethical, legal, economic, and technical aspects are examined. Field trips, written and oral progress and final reports, and project planning procedures are an integral part of the two course sequence.

Each student is assigned a faculty adviser at the beginning of the sophomore year; the adviser provides academic and career guidance for that student until graduation. Ten civil engineering faculty have earned professional registration.

Program of Studies

SOPHOMORE YEAR

<i>First Semester</i>		<i>Credits</i>
CEE 2101	Engineering Mechanics I - Statics	3
CEE 3702	Civil Engineering Numerical Analysis	3
CEE 2602	Civil Engineering Measurements	3
MAT 2500	Mathematical Analysis II	4
PHY 2402	Physics II, Electricity and Magnetism	3

<i>Second Semester</i>		<i>Credits</i>
CEE 2102	Engineering Mechanics II - Dynamics	3

Villanova University

CEE 2103	Mechanics of Solids	3
GLY 2805	Geology for Engineers	3
MAT 2705	Differential Equations with Linear Algebra	4
ME 2950	Materials Testing	1
ME 3100	Thermodynamics I	3

JUNIOR YEAR

<i>First Semester</i>		<i>Credits</i>
CEE 3111	Fluid Mechanics	3
CEE 3211	Transportation Engineering	3
CEE 3401	Structural Mechanics	3
CEE 2702	Probability in Civil Engineering Design	3
CEE 3911	Fluid Mechanics Laboratory	1
Elective	Theology/Philosophy	3

<i>Second Semester</i>		<i>Credits</i>
CEE 3101	Soil Mechanics	3
CEE 3501	Environmental Engineering I	3
CEE 3511	Hydraulic Engineering and Hydrology	3
CEE 3901	Soil Mechanics Laboratory	1
Elective	CEE Design Elective ¹	4
Elective	Theology/Philosophy	3

SENIOR YEAR

<i>First Semester</i>		<i>Credits</i>
CEE 4605	Civil Engineering Design Project I	3
CEE 4701	Economy and Risk	3
Elective	CEE Design Elective ²	4
Elective	CEE Design Elective ²	4
ECE 6020	Introduction to Electrical Systems	3
Elective	Humanities	3

<i>Second Semester</i>		<i>Credits</i>
CEE 4606	Civil Engineering Design Project II	3
Elective	CEE Elective ³	3
Elective	Free	3
Elective	Theology/Philosophy	3
Elective	Social Science	3

¹CEE students select one from the following design course sequences:

CEE 3224	Transportation Facilities Design	3
CEE 3924	Transportation Facilities Design Laboratory	1
or		
CEE 3422	Structural Design	4

²CEE students select two from the following design course sequences:

CEE 4522	Environmental Engineering II	3
CEE 4922	Environmental Engineering Laboratory	1
or		
CEE 4523	Water Resources Engineering Design	4

College of Engineering

or

CEE 4821	Geological Engineering	4
³ CEE students select one from the following:		
CEE 4225	Advanced Transportation Engineering	3
CEE 4423	Computer-Aided Structural Engineering	3
CEE 4723	Modeling of Civil Systems	3
One of the Civil Engineering Design Course Sequences not selected previously		4

BACHELOR OF COMPUTER ENGINEERING

Students in the Computer Engineering program study basic science, mathematics, computer science, electrical engineering, design, communication skills, and the humanities in order to prepare for a professional career or advanced study in computer engineering or computer science. The computer engineering program includes courses from the programs of computer science and electrical engineering, providing balanced coverage and integration of the hardware and software aspects of computer systems. In addition, this program emphasizes theoretical concepts, laboratory skills, computer fluency, simulation skills, and the design process.

The design process is emphasized throughout all four years, and design projects are included in the laboratory courses. The sophomore and junior years include core courses in computer algorithms, digital system design, computer architectures, microprocessor systems, computer interfacing, and the C programming language. This provides a foundation for the senior year which includes electives and an in-depth two-term design project. Students can tailor their senior year towards a variety of objectives by carefully choosing electives in computer engineering, the humanities, and other subjects. The Electrical and Computer Engineering Department provides these specialized areas: very large scale integrated (VLSI) circuits, computer communications, software engineering, neural networks, and artificial intelligence.

Senior electives can also be used to complement the computer engineering requirements with studies in fields outside of the department. Possibilities include a computer science minor, a mathematics minor, a business minor or a business concentration. Selection of specializations and study options require each student to assume an active and responsible role in the planning and decision making as the program unfolds. To aid in this, detailed information is available from the departmental office and can be discussed with the chairperson or the Computer Engineering program adviser.

Program of Studies - class of 2001

SOPHOMORE YEAR

<i>First Semester</i>		<i>Credits</i>
CSC 1051	Algorithms and Data Structures I	4
ECE 2190	Electrical Circuits	4
ECE 2409	Fundamentals of MATLAB	2
ECE 2490	Digital Systems and Computers	4
MAT 2705	Differential Equations with Linear Algebra	4

<i>Second Semester</i>		<i>Credits</i>
CSC 1052	Algorithms and Data Structures II	4
CSC 1300	Discrete Structures I	3
ECE 2210	Electrical Circuits and Systems	3
PHY 2402	Physics II, Electricity and Magnetism	3
Elective	Social Science	3

JUNIOR YEAR

<i>First Semester</i>		<i>Credits</i>
CSC 1700	Design and Analysis of Algorithms	3
ECE 2510	Electronics I	3
ECE 2915	Electrical Engineering Laboratory I	2
ECE 3790	Signal Processing	4
Elective	Humanities	3

<i>Second Semester</i>		<i>Credits</i>
CSC 1600	Operating Systems	3
CSC 4700	Software Engineering	3
ECE 3420	Expert Systems Programming	3
ECE 3490	Microcomputer System	4
ECE 3951	Computer Engineering Design Seminar	2

SENIOR YEAR

<i>First Semester</i>		<i>Credits</i>
ECE 3480	Digital Systems Engineering	4
ECE 3720	Engineering Probability and Statistics	3
ECE 4951	Computer Engineering Project I	2
Elective	Technical Elective ¹	3
Elective	Free	3
Elective	Humanities	3

<i>Second Semester</i>		<i>Credits</i>
ECE 4991	Computer Engineering Project II	4
Electives	Technical Electives ¹	6
Elective	Free	3
Elective	Humanities	3

¹Technical electives must be chosen from the approved list of computer engineering or computer science courses.

BACHELOR OF ELECTRICAL ENGINEERING

Students in the Electrical Engineering program study basic science, mathematics, engineering science, electrical engineering, design, measurements, communication skills, and the humanities in order to prepare for a professional career and advanced study in electrical engineering. The program emphasizes theoretical concepts, laboratory skills, computer fluency, simulation skills, and the design process.

The design process is emphasized throughout all four years, and design projects are included in the laboratory courses. The sophomore and junior years include core courses that provide a foundation for the senior year which includes electives and an in-depth two-term design project. Students can tailor their senior year towards a variety of objectives by carefully choosing electives in electrical engineering, the humanities, and other subjects. The Electrical and Computer Engineering Department provides these specialized areas: communications and signal processing; systems and control; computer engineering; microelectronics; electromagnetics and applied physics; and digital systems.

Seniorelectives can also be used to complement the electrical engineering requirements with studies in fields outside of the department. Possibilities include a computer science minor, a mathematics minor, a physics minor, a business minor or a business concentration.

All students acquire a working knowledge of computers and their applications by studying algorithms, programming, and the design and interfacing of computers. The microcomputer laboratory program provides hands on experience with software and hardware interfacing techniques. Senior electives provide applications of

College of Engineering

computer-aided analysis and design, simulation, and real-time laboratory processing in areas such as systems, control, communications, signal processing, and microwave circuits. Selection of specializations and electives requires each student to assume an active and responsible role in the planning and decision making as the program unfolds. To aid in this, detailed information is available from the departmental office and can be discussed with the chairperson or the student's faculty adviser.

Program of Studies – class of 2001

SOPHOMORE YEAR

<i>First Semester</i>	<i>Credits</i>
ECE 2190 Electrical Circuits	4
ECE2409 Fundamentals of MATLAB	4
ECE 2490 Digital Systems and Computers	4
MAT 2705 Differential Equations with Linear Algebra	4
PHY 2402 Physics II, Electricity and Magnetism	3

<i>Second Semester</i>	<i>Credits</i>
ECE 2210 Electrical Circuits and Systems	3
ECE 2420 Engineering Programming and Applications	3
ECE 2510 Electronics I	3
ECE 2915 Electrical Engineering Laboratory I	2
MAT 2500 Mathematical Analysis III	4
PHY 2403 Physics Lab for Engineering	1

JUNIOR YEAR

<i>First Semester</i>	<i>Credits</i>
ECE 3490 Microcomputer Systems	4
ECE 3510 Electronics II	3
ECE 3690 Engineering Electromagnetics	4
ECE 3915 Electrical Engineering Laboratory II	2
Elective Social Science	3

<i>Second Semester</i>	<i>Credits</i>
ECE 3590 Semiconductor Materials and Devices	4
ECE 3720 Engineering Probability and Statistics	3
ECE 3790 Signal Processing	4
ECE 3950 Electrical Engineering Design Seminar	2
Elective Humanities	3

SENIOR YEAR

<i>First Semester</i>	<i>Credits</i>
ECE 4290 Engineering System Models and Control	4
ECE 4790 Electrical Communications	4
ECE 4950 Electrical Engineering Project I	2
Elective Technical Elective ¹	3
Elective Humanities	3

<i>Second Semester</i>	<i>Credits</i>
ECE 4990 Electrical Engineering Project II	4
Electives Technical Electives ¹	6
Elective Free	3

Elective Humanities 3

¹Technical electives must be chosen from the approved list of electrical engineering courses.

BACHELOR OF MECHANICAL ENGINEERING

Mechanical Engineering is concerned with applying the principles of solid mechanics, fluid mechanics, thermodynamics, heat transfer, material science, dynamics and control to the analysis and design of machines and systems of all types. In applying this technical knowledge, the mechanical engineer must consider economic constraints and the social and ecological implications of solutions imposed. The mechanical engineering curriculum offers the student an opportunity to pursue educational objectives within the framework of this broad theme.

The first two years of the mechanical engineering program are devoted to laying a foundation of mathematics, physical science, and the general engineering sciences. The junior and senior years are devoted primarily to mechanical engineering topics. The required courses span the field of mechanical engineering, and career/ME electives provide the opportunity to pursue specific areas of the discipline in greater depth. The student chooses three courses (9 credit hours) of technical electives plus an additional three credits of a career/free elective. The design process is emphasized throughout the program and culminates with a senior year project that requires a synthesis of basic principles learned in previous courses.

All Mechanical engineering students are required to take at least one of the elective courses offered by the department, designated as the ME elective in the program of studies. Ordinarily students will take two more such courses, designated career/ME electives and one other course, designated the career/free elective, which can be any three credit course. However, the career/ME and the career/free elective slots may be applied to a minor or concentration in Liberal Arts & Sciences or to a minor in Business. The specific courses must be selected in conjunction with the appropriate departmental office and the student’s academic adviser. A concentration requires that the student complete fifteen credit hours of appropriate courses. Requirements for a minor are set by the appropriate department. All concentrations and minors must be approved by the Chair of Mechanical Engineering.

Any course which meets a Mechanical Engineering curriculum requirement and also a requirement for a concentration or minor, may be counted for both. However, a concentration or minor will usually require taking one or more courses in addition to those needed for the Bachelor of Mechanical Engineering degree.

Throughout the curriculum the technical courses are balanced by a careful selection of humanities and religious studies courses to ensure that the effects of technology on society are given due consideration in design.

3+2 Bachelors-Masters Program.

A full-time student also has the option of pursuing a 3+2 Bachelors-Masters Program. Admission to this program is contingent upon the student’s achievement of an acceptable QPA at the start of the senior year. If admitted to the program, three career/ME electives must be taken from 7000-level ME courses during the senior year. These three courses will also count toward the requirements for a Master of Mechanical Engineering degree. During both the senior and fifth year, the admitted student must meet all graduate engineering requirements. Once the BME degree requirements have been completed, the student will receive a Bachelor of Mechanical Engineering degree. Upon the completion of graduate work during the fifth year, the student will receive a Master of Mechanical Engineering degree. Graduate work must be completed at Villanova in order to earn the degree.

A faculty adviser is assigned to each student at the beginning of his/her sophomore year to provide academic and career guidance for the remainder of the student’s years in the program until graduation. The adviser should be consulted regarding such topics as career electives, minors or concentrations, and completion of degree requirements for graduation.

Program of Studies

SOPHOMORE YEAR

First Semester

Credits

College of Engineering

CEE 2101	Engineering Mechanics I Statics	3
MAT 2500	Mathematical Analysis II	4
ME 2500	Mechanical Engineering Analysis & Design I	3
PHY 2402	Physics II: Electricity and Magnetism	3
PHY 2403	Physics Lab for Engineers	1
C.A. 1100	Fundamentals of Public Speaking	3

Second Semester

Credits

CEE 2102	Engineering Mechanics II - Dynamics	3
CEE 2103	Mechanics of Solids	3
MAT 2705	Introduction to Differential Equations	4
ME 2901	Mechanical Engineering Laboratory I	2
ME 2501	Mechanical Engineering Analysis & Design II	3
ME 2113	Manufacturing Engineering	3

JUNIOR YEAR

First Semester

Credits

ME 3300	Materials Science I	3
ME 3500	Mechanical Engineering Analysis & Design III	3
ME 3902	Mechanical Engineering Laboratory II	2
ME 3401	Stress Analysis I	3
ME 3100	Thermodynamics I	3
Elective	Theology/Philosophy ³	3

Second Semester

Credits

CEE 3111	Fluid Mechanics	3
ECE 6020	Introduction to Electrical Systems	3
ME 3200	Machine Design	4
ME 5202	Vibrations	3
ME 3101	Thermodynamics II	3
ME 3903	Mechanical Engineering Laboratory III	2

SENIOR YEAR

First Semester

Credits

ME 4800	Design Seminar in Mechanical Engineering I	1
ME 4901	Mechanical Engineering Laboratory IV	2
ME 4101	Heat Transfer I	3
ME 4102	System Dynamics ³	3
Elective	Theology/Philosophy	3
Elective	Social Science	3
Elective	ME Elective	3

Second Semester

Credits

ME 4801	Design Seminar in Mechanical Engineering II	3
Elective	Theology/Philosophy ³	3
Elective	Professional Development ¹	3
Elective	Career/ME Electives	6
Elective	Career/ME or Free ²	3

¹Select one of the following: EGR 2001, ME 6621, PHI 1600, PHI 2150, PHI 3820, or PHI 3825.

²This is a career elective for those students pursuing a concentration as described above; for all other students it serves as a free elective.

³See Theology and Philosophy under Humanities and Social Science Electives.

HUMANITIES AND SOCIAL SCIENCE ELECTIVES

Theology and Philosophy

In addition to required courses specified for each degree program, candidates for degrees in engineering must successfully complete 12 credits from the following:

- ? THL 1050 (Christianity: Traditions and Transitions).
- ? One 3-credit THL course at the 2000 level or above.
- ? Two additional 3-credit courses chosen from among the following:
 - ? THL courses at the 2000 level or above
 - ? Any Philosophy courses, including PHI 2150 (Engineering Ethics)
 - ? EGR 2001 Engineering: The Humanistic Context
 - ? Any Peace and Justice Course
 - ? ETH 2050 College Ethics

Humanities and Social Science

All students select their remaining humanities and social science electives from among the courses listed in this catalog and offered by the following departments. All students must take at least one course from a Social Science Department.

Humanities

Arab & Islamic Studies
Art History (except skills courses)
Classical Studies
Communication (except skills courses)
English (Literature)
History
Honors Program (for eligible students only)
Modern Languages (except courses
in native language)
Philosophy
Theology and Religious Studies (2000 and above)

Social Sciences

Economics
Geography
Peace and Justice
Political Science
Psychology
Sociology
Women's Studies (selected courses only)

Theatre (except skills courses)

In selecting their humanities and social science electives, students should select a series of related courses that provide breadth and depth of understanding, rather than a series of unrelated introductory courses. Courses primarily emphasizing skills (such as acting, painting, sculpting, public speaking, etc.) are not acceptable.

SPECIAL PROGRAMS AND OPTIONS

MINORS AND CONCENTRATIONS

College of Engineering

The College of Engineering provides the flexibility for its students to pursue various program additions and options. These include a dual degree program leading to a Bachelor of Arts Degree; academic minors in Business, Chemistry, Computer Science, Mathematics, and Physics; the Honors Program; and the Naval Science (NROTC) Program. See details below and in the appropriate departmental listings.

Bachelor of Arts - Dual Degree Program

Under this program it is possible for undergraduate engineering students to earn a Bachelor of Arts Degree in addition to a Bachelor's Degree in Engineering. Depending on the student's engineering major, the student must successfully complete 14 to 17 additional courses beyond those required for the engineering degree. Engineering students wishing to enter this Dual Degree Program must write a letter to the Dean of Engineering requesting admission into the program.

More specific information on this program is available to interested engineering students in the office of the Dean of Engineering.

Business Minor

Students may earn a minor in Business by successfully completing the following eight courses: ACC 1001 or 1101, 1102; BL 1090; ECO 1001, 1002; FIN 1113; MGT 1102; MKT 1137. The mathematics requirements for a Bachelors Degree in Engineering also satisfy the mathmatics requirements for the business minor. *NOTE:* some of these courses carry prerequisites. Also, see the college of Commerce and Finance concerning specific requirements for a laptop computer.

Since the number of engineering students in this program is restricted, admission to it is on a limited basis, and *interested students must request admission prior to the beginning of their sophomore year*. All courses for the business minor must be taken at Villanova University. Credit for the above courses may not be obtained by means of the Credit By Examination Program. Additional information on this program is available to interested engineering students in the *College of Engineering Student Handbook*.

Computer Engineering Concentration/Computer Engineering Minor

Students may earn a concentration in computer engineering by successfully completing the following seven courses: ECE 2190, ECE 2420, ECE 2490, ECE 3480, ECE 3490; and two of the following: ECE 5430, ECE 5443, ECE 5447, ECE 5450, ECE 5484.

Students may earn a minor in computer engineering by successfully completing: ECE 2190, ECE 2420, ECE 2490, ECE 3490; and one of the following: ECE 3480, ECE 5430, ECE 5443, ECE 5447, ECE 5450, ECE 5484.

Pre-requisite courses must be satisfied prior to taking a course.

ACADEMIC POLICIES AND INFORMATION

Unless otherwise noted, the College of Engineering follows the general university academic policies and regulations listed in the University section of this *Catalog*. *It is the responsibility of the student to know and comply with all academic policies and regulations of the University and of the College of Engineering. Such policies may change without prior notice.* Policies specific to the College of Engineering follow:

ACADEMIC STANDING

In order to remain in good academic standing, undergraduate engineering students must maintain a cumulative Quality Point Average (QPA) of at least 2.00 and a cumulative Technical Quality Point Average (TQPA) of at least 2.00. Technical courses are defined as all engineering, science, and mathematics courses.

ADVANCED ACADEMIC CREDIT

Advanced Placement. Information on advanced placement credit is found in the current issue of the *College of Engineering Student Handbook*.

ADVISING

During the freshman year a student is encouraged to learn more about the engineering profession in order to make a more informed choice of a major field of study. Assistance necessary to arrive at this decision (which is made at the end of the freshman year) is provided by the College of Engineering in the following ways:

- ? As a freshman, a student is assigned to an engineering adviser, who provides career planning advisement and when appropriate, referrals. In addition, the College of Engineering sponsors Fall and Spring Seminars which inform freshmen students about career opportunities available in each major field of engineering.
- ? Academic advisement for freshmen, i.e. class scheduling and course adjustments, is provided by the Assistant to the Dean of Engineering.
- ? Advising for upper class engineering students is provided by each of the engineering departments for the students who are majoring in the program offered by the department.

AUDIT

A student may elect to audit a course to reinforce and strengthen his/her current knowledge or to explore new areas without the pressure of tests and grades. No academic credit is earned for auditing a course. However, the audited course is noted on the student's official record. Permission to audit a course must be obtained from the student's adviser.

AWARDS AND HONORS

Full-time engineering students who achieve a semester Quality Point Average of 3.25 or higher qualify for the Dean's List in the College of Engineering.

The Dean's Award for Academic Achievement is presented to engineering seniors in recognition of outstanding academic performance in their undergraduate studies in the College of Engineering. Seniors with a cumulative Quality Point Average of 3.50 or more are eligible for this award.

The Dean's Award for Meritorious Service is presented to engineering seniors in recognition of exceptional dedication and service unselfishly given to the College of Engineering over an extended period of time. The quality and consistency of the service to the College are recognized by means of this award.

In order to recognize and encourage excellence in scholarship, chapters of the following national honorary engineering societies are maintained by the college: Tau Beta Pi, for all engineers; Chi Epsilon, for Civil Engineers; Eta Kappa Nu, for Electrical Engineers and Computer Engineers; and Pi Tau Sigma, for Mechanical Engineers.

COMPUTING

College and University Computing.

The campus is networked with an ETHERNET backbone which is also linked to the World Wide Web (WWW) and Internet networks. In addition to the several public computing sites located around the campus, the Computer-Aided Engineering (CAE) Centers provide workstations specifically dedicated to meeting the computing needs of engineering students. Access to these workstations is provided 24 hours a day, 7 days a week. The workstations provide network access as well as microcomputer capabilities, using DOS, Windows, Macintosh, and UNIX operating systems.

Departmental Computing

There are more than 100 microcomputer workstations located in engineering classrooms, laboratories, and the four engineering departments.

The **Chemical Engineering** Department makes available a number of personal computers for student use in carrying out classroom assignments. It has also dedicated several personal computers to data acquisition and control in laboratory experiments. Chemical Engineering students utilize the mainframe University computer system to run large-scale packaged software for process systems and distillation column design, including SimSci's PROCESS, Aspentech's MAX, and TTOT. The departmental computer laboratory also provides a wide range of special-purpose software prepared by the CHE department faculty in the sciences of material and energy balances, thermodynamics, process control, fluid flow and heat/mass transfer.

The **Civil and Environmental Engineering** Department's computer facilities include personal computers and associated printers and plotters. A variety of commercial and in-house developed software including MATLAB, ANSYS, STAAD-III, HEC-RAS, HEC-HMS, HCS, KERN, KYPIPES, HY8 and AUTOCAD are used in the curriculum. Student exposure to computer-based applications include spreadsheet and economic analysis, structural design of buildings and bridges, simulation of operating piping-pumping systems, sensitivity and matrix analysis of civil engineering systems, generation of hydrographs, culvert hydraulics, and transportation system planning.

The **Electrical and Computer Engineering** Department utilizes a Sun file server with Sun workstations and DEC graphics terminals, which are available in the VLSI Laboratory. The Electrical and Computer Engineering Macintosh Laboratory has six Mac IIci's and eighteen Mac IIx's. In addition the department has PC's, HP CAE workstations and a Motorola 68000 microprocessor system. The department software includes UNIX, SMP, ILS, FORTH, HP ECE Design Center software, MATLAB, SIMULINK, and PSpice. This software is used for digital signal processing, real-time control and robotics, microwave measurement, and the design of analog and digital circuits and systems.

The **Mechanical Engineering** Department has personal computers, that are equipped with data acquisition systems and software for graphing, designing, and calculating. Software includes MATLAB, FLUENT, MATHCAD, ANSYS, AUTOCAD, ALGOR, PCDEFORM™, DADS, Working Model 3D™ and other applications programs used for finite element analysis, heat transfer and fluid flow, and multi body dynamic analysis.

INTERNATIONAL STUDIES

The College of Engineering, in recognizing the continued changes globally in both the learning and practicing of the skills of engineering, encourages all its majors to consider studying in an overseas university some time during their four years at Villanova. In enhancing language and communication skills, in addition to taking courses in engineering where appropriate, Villanova Engineers will strengthen their own liberal arts program so integral to a Villanova Engineering degree.

Students may consider applying directly into overseas universities, going through Villanova approved sending institutions, or studying overseas for a year as part of a student exchange, such as the present exchange program with the Victoria University of Manchester in Manchester, UK. Interested students should see the detailed discussion of International Studies in the Villanova University section of this catalog or contact the Office of International Studies, St. Augustine Center, Room 415, (phone 610-519-6412).

LABORATORY FACILITIES

Dedication of the Center for Engineering Education and Research (CEER) took place in June 1998. The multi-million dollar facility provides leading edge technological support for teaching and research in the College of Engineering.

The 88,400-square-foot structure houses 30 instructional and research laboratories, a computer-aided engineering center, an interdisciplinary student projects laboratory, 12 student group study rooms, and a multi-media lecture hall seating 140. Each of the building's four levels has a student advising room and a conference room.

The **Chemical Engineering** Department maintains modern laboratory facilities to support the Bachelor of Chemical Engineering curriculum. Experiments in the three Chemical Engineering Laboratory courses range from the demonstration of fundamental principles in bench-scale or pilot plant equipment, to hands-on experience with fully integrated, industrial scale process equipment. In addition, the department maintains extensive general-purpose laboratory capabilities for those students who carry out an experimental investigation as part of their senior Independent Study project.

The **Civil and Environmental Engineering** Department is committed to "hands-on" education in its experimental, computational, and design laboratories. Facilities are currently dedicated to instruction and research capabilities in materials (soils, concrete), environmental, geology, structural, measurements, fluid mechanics and hydraulics.

The **Electrical and Computer Engineering** Department laboratory facilities are available to serve as important components of study in specialized areas as well as for core studies. Laboratories are currently in place for instruction and research in Control Systems, Digital Systems and Microprocessors, Electronics, Signal Processing, Intelligent Systems, Solid State Devices, Microwaves, Microcontrollers, Audio, Advanced Electronics, Advanced Computer Systems, Antenna Anechoic Chamber, Antenna Research, Communications, Student Projects.

The **Mechanical Engineering** Department laboratories provide an environment for students to reinforce their understanding of the fundamental principles of mechanical engineering and apply that knowledge in experimental analysis and problem-solving. Laboratories currently available include Manufacturing Processes, Thermodynamics, Engine Testing, Materials Testing and Material Science, Vibration, Stress, Heat Transfer, and Wind Tunnel.

SATISFACTORY/UNSATISFACTORY POLICY

Upperclass engineering students may elect to take on a Satisfactory/Unsatisfactory basis one course per semester which meets all of the following criteria: 1) it is not specifically designated by course number in the curriculum of the student's major; 2) it is not being given by the department in which the student is majoring; 3) it is not designated as a Technical Elective in the curriculum of the student's major; 4) permission to take the course has been specifically granted by the chair of the department in which the student is majoring.

To take a course on a Satisfactory/Unsatisfactory basis, the student must first register for the course by the normal procedure. After registration has been completed, the student must complete a Satisfactory/Unsatisfactory form (supplied by the Registrar's Office); this form must be signed by the student's department chair.

Other pertinent information is found under the "Grading System" policies in the University section of this *Catalog*.

REGISTRATION OPTIONS

Qualified undergraduate engineering students are permitted and encouraged to enroll in more challenging courses than those specified in their standard curriculum, provided that they obtain approval from their department chairperson and other appropriate individuals where necessary, as indicated below.

Engineering students wishing to utilize advanced placement consideration to take more advanced courses in English or Modern Languages may do so upon discussion with the Assistant to the Dean of Engineering and the chairperson of the respective department offering the course.

Required and elective courses in the humanities and social sciences may be taken through the **Honors Program** for those students who qualify. Application should be made directly to the Director of the Honors Program.

Undergraduate students wishing to enroll in an engineering **graduate course** must have written approval from their department chairperson and the chairperson of the department offering the course. Permission will normally be granted only to seniors who have a cumulative Grade Point Average of 3.0 or higher. Permission to enroll in graduate courses offered by other Colleges within the University must be obtained from the Dean of that College as well as the chairperson of the department offering the course and the student's department chairperson.

SCHOLASTIC LOADS AND OVERLOADS

The individual engineering majors are comprised of appropriately sequenced course groupings referred to as "regular semester course loads." Students enrolled in the College of Engineering may take up to four credits, or one course overload, in any given semester provided that (1) a freshman has permission from the Dean of Engineering, or (2) an upperclassman has approval from his adviser and chairperson.

STUDENT ORGANIZATIONS

In order to encourage close contact between our engineering students and practicing professional engineers, the College of Engineering maintains student chapters of the following major engineering societies: American Institute of Chemical Engineers (AIChE), American Society of Civil Engineers (ASCE), Institute of Electrical and Electronics Engineers (IEEE), and the American Society of Mechanical Engineers (ASME). These groups, with

the cooperation and support of the faculty and practicing professional engineers, organize and sponsor meetings and field trips of interest to engineering students.

The Villanova chapter of the Society of Women Engineers promotes the social growth and professional development of women in all fields of engineering. VUMES (Villanova University Minority Engineers & Scientists) promotes the social growth and professional development of minorities in the fields of engineering.

The broader professional and social interests of all engineering students are served by the Villanova University Engineering Joint Council. Membership in this organization is open to all undergraduate engineering students.

STUDENT PUBLICATION

The *Villanova Engineer* magazine is published by a staff of undergraduate engineering students twice a year. Its purpose is to provide a forum for communication of student ideas and concerns in both technical and non-technical areas.

TECHNICAL ELECTIVES

Students who are required to select technical electives as part of their departmental program are required to select these electives from among the courses listed in this *Catalog* and offered by the following departments: Astronomy, Biology, Chemistry, Chemical Engineering, Civil and Environmental Engineering, Computing Sciences, Electrical and Computer Engineering, Mathematical Sciences, Mechanical Engineering, and Physics. The selection must be done with the advice and approval of the student's adviser and chairperson.

TRANSFER OF CREDIT

With recommendation of their department chair, and approval of the Dean, engineering students are permitted to earn course credit at other schools. In order to initiate a request to do this, the student must obtain and complete a Course Elsewhere Form, available in the Office of the Dean of Engineering. A complete description of the substitute course content in the form of a copy of the other institution's official course catalog must be attached to this form. The student should allow 7-10 days for final action to be taken on the request. After that time, the student making the request should contact the Dean's Office to determine the outcome.

Students who have completed approved courses elsewhere must request that institution to forward a transcript to the Office of the Dean of Engineering. *NOTE:* only courses in which a grade of "C" (or the equivalent) or better is received will be transferred for credit. Grades of courses taken elsewhere are *not included* in the calculation of the Quality Point Average (QPA) or Technical Quality point Average (TQPA) at Villanova University.

College-level work done prior to high school graduation may be awarded transfer credits upon receipt of evidence that the course was/is taken beyond the minimum requirements for high school graduation, according to the curriculum requirements of the school. In addition, all other University admission requirements must be fulfilled.

WITHDRAWAL FROM COURSES

Engineering student requests for authorized withdrawal from a course without penalty (WX) will be granted automatically until the Friday after mid-term break. After that date the student must present a valid reason for the request, such as insufficient information to determine standing in the course, (i.e., grades on tests and assignments), or serious personal or medical problems. The Dean of Engineering will decide whether or not to grant these requests based on the information supplied by the student and recommendations from the faculty member teaching the course and, in the case of upperclass students, the chairperson of the department in which the student is majoring. The Dean will inform the student of his decision and the reason for it.

WITHDRAWAL FROM THE UNIVERSITY

Engineering students who decide to withdraw voluntarily from the university must complete and submit a withdrawal form to the Dean of the College of Engineering. Withdrawal forms are available in the Dean's Office. After the form has been submitted, the student may also be interviewed by an administrator in the College of Engineering.

DEPARTMENTS

NOTE: In the courses listed below, the semester listings indicate which semester the courses is offered. If there is no semester listing, the course is offered on an occasional basis only.

CHEMICAL ENGINEERING

Chair and Professor: Kelly

Professors: Joye, Punzi,

Associate Professor: Skaf

Assistant Professors: Ritter, Muske

Office: 217 Chemical Engineering Annex, tel. 519-4950

CHE 2011 Introduction to Chemical Engineering

Overview of chemical engineering: elements of chemical manufacturing processes, engineering economics, engineering design and the role of the chemical engineer. **(1 cr)** *Sem 1. Prereq: Soph. Standing in engineering.*

CHE 2022 Statistical Methods of Data Analysis

Statistical methods for design of experiments and analysis of data: variance, precision and accuracy, standard statistical distributions, comparison of data, interpretation of statistical analyses. **(2 cr)** *Sem 2. Prereq: MAT 1505.*

CHE 2032 Chemical Engineering

Thermodynamics I Thermodynamics of single component systems: applications of first and second laws, steady-state and transient energy balances, equations of state, thermodynamic properties of fluids, thermo-chemistry. **(3 cr)** *Sem 2. Prereq: CHE 2041.*

CHE 2041 Chemical Process Calculations

Application of physical and chemical principles to

the solution of steady-state and transient material balances. **(4 cr)** *Sem 1. Three lecture periods and three laboratory hours per week. Prereq: CHM 1151 and 1152, MAT 1505, EGR 1611. Coreq: CHM 3411.*

CHE 2122 Numerical Methods in Differential

Equations Finite difference approximations to ordinary and partial differential equations, solution by forward-integrating, matrix inversion and iterative techniques using digital computers, error propagation, stability and convergence considerations. **(2 cr)** *Sem 2. Prereq: MAT 2705.*

CHE 2232 Fluid Flow Operations Fluid statics, fluid properties, flow of incompressible fluids in conduits, friction factors, meters, pumps, external flow, drag, flow in packed and fluidized beds. **(3 cr)** *Sem 2. Prereq: CHE 2041.*

CHE 3031 Heat Transfer Operations Principles of heat flow, mechanisms of conduction, convection and radiation, correlations for heat transfer coefficients, heat transfer equipment and process

applications. (3 cr) Sem 1. Prereq: CHE 2032, 2232.

CHE 3032 Principles of Mass Transfer

Fundamentals of interphase mass transfer: mechanisms, driving force and resistance to transfer, design and analysis of continuous and staged contacting processes, gas absorption and stripping, binary distillation, liquid extraction. (3 cr) Sem 2. Prereq: CHE 3031, 3131.

CHE 3131 Chemical Engineering

Thermodynamics II The fundamental property relation, thermodynamic properties of single and multiple pure phases, homogeneous multicomponent phases, ideal and non-ideal liquid solutions, phase equilibria, chemical reaction equilibria, problem solving techniques, applications. (3 cr) Sem 1. Prereq: CHE 2032.

CHE 3232 Dynamic Simulation and Control

Applications Introduction to process control concepts and applications, computer simulation of processes during transient change, real-time analysis of controlled systems. (3 cr) Sem 2. Prereq: CHE 2122, 3031.

CHE 3921 Chemical Engineering Laboratory I

Illustration of chemical engineering principles using laboratory and pilot scale equipment, analysis and correlation of data, effective communication and reporting of outcomes, and principles of laboratory safety. (2 cr) Sem 1. Six laboratory hours per week; Coreq: CHE 3031.

CHE 3922 Chemical Engineering Laboratory II

Continuation of CHE 3921. (2 cr) Sem 2. Six laboratory hours per week; Prereq: CHE 3921. Coreq: CHE 3032.

CHE 4131 Process and Equipment Design

Application of fundamental principles of chemical engineering to design of industrial processes; use of process simulators (such as AspenTech MAX and SimSci Process) for process and equipment design. (3 cr) Sem 1. Prereq: CHE 3032, 3232.

CHE 4811 Professional Development Seminars with staff and guest speakers to develop professional outlook: ethics, social responsibility,

employer-employee relationships, career paths, interviewing. (1 cr) Sem 1. Prereq: Jr. Standing in Chemical Engineering.

CHE 4812 Chemical Engineering Seminar Guided practice in use of published sources of technical information. Literature investigation of a technical topic outside of core chemical engineering, including oral presentation. (1 cr) Sem 2. Prereq: Sr. Standing in Chemical Engineering.

CHE 4831 Chemical Engineering Projects I

Independent investigation of a chemical engineering problem, under supervision of a faculty adviser, including a written comprehensive report. (Nine hours per week of independent study). (3 cr) Sem 1&2. Prereq: Sr. Standing in Chemical Engineering.

CHE 4832 Chemical Engineering Projects II

Continuation of CHE 4831. May include further investigation of same problem or a different topic. (3 cr) Sem 2. Prereq: Sr. Standing in Chemical Engineering.

CHE 4911 Chemical Engineering Laboratory III

Continuation of CHE 3922. (1 cr) Sem 1. Three laboratory hours per week. Prereq: CHE 3922. Coreq: CHE 5131.

CHE 5001 Industrial Liquid and Solid Waste

Treatment Industrial waste management: nature and sources of waste streams, principles underlying chemical and physical treatment methods, case studies of treatment technology. (3 cr) Sem 2. Prereq: Jr. Standing in engineering.

CHE 5002 Principles of Air Pollution Control

Causes, effects and control of air pollution, emphasizing fundamental mechanisms: pollutant generation, atmospheric dispersion, sampling/analysis and data interpretation, air pollution control technology. (3 cr) Sem 2. Prereq: Jr. Standing in engineering.

CHE 5031 Modeling and Numerical Methods in

Chemical Engineering Application of rate laws and conservation equations to modeling by differential equations of physical systems, numerical solution of ordinary and partial differential equations

by finite difference approximations. **(3 cr)** *Sem 1. Prereq: CHE 2122, Jr. Standing in Chemical Engineering.*

CHE 5032 Process and Equipment Design II

Continuation of CHE 4131, with emphasis on equipment design. **(3 cr)** *Sem 2. Prereq: CHE 4131.*

CHE 5131 Chemical Reaction Engineering I

Principles and methods of chemical kinetics and reactor design applied to homogeneous reactive systems of industrial importance: stoichiometry and rate laws for simple and complex reactions, analysis of reaction rates, isothermal reactors, introduction to temperature effects. **(3 cr)** *Sem 1. Coreq: CHE 4131.*

CHE 5132 Transport Phenomena

Unified study of heat, mass and momentum transport: underlying physical laws, mathematical representation of transport laws, analogies between different transport modes, estimation of transport properties, applications. **(3 cr)** *Sem 2. Prereq: Jr. Standing in engineering.*

CHE 5231 Engineering Economics and

Optimization Methods of economic evaluation and decision making, applied to engineering problems: cost estimation and indexing, time value of money, depreciation, comparison of alternatives, optimization techniques with single and multiple variables. **(3 cr)** *Sem 1. Prereq: Jr. Standing in engineering.*

CHE 5232 Chemical Reaction Engineering II

Principles and methods of chemical kinetics and reactor design applied to heterogeneous reactive

systems of industrial importance: catalysis and catalytic reactors, catalyst deactivation, diffusion effects, design of heterogeneous catalytic and non-catalytic chemical reactors. **(3 cr)** *Sem 2. Prereq: CHE 5131.*

CHE 5331 Introduction to Process Control Theory

Mathematical tools for control Systems analysis: linear open- and closed-loop systems, frequency response techniques, multi-variable process control, sampled-data control techniques, other advanced topics. **(3 cr)** *Sem 1. Prereq: CHE 3232 .*

CHE 5332 Special Topics in Chemical Engineering

Selected topics in chemical engineering: recent developments, new technology, applications of other disciplines to chemical engineering problems. **(3 cr)** *Sem 1&2. Prereq: Jr. Standing in Chemical Engineering.*

CHE 5532 Introduction to Biotechnology

Production of commercially useful materials by living organisms, emphasizing emerging technology: biologically important compounds, their relationships to genetics and metabolic pathways, controlled growth of microbes, separation and purification of products. **(3 cr)** *Sem 2. Prereq: Jr. Standing in Ch. E., Sr. Standing in engineering or physical sciences.*

CHE 5632 Polymer Science and Engineering

Basic principles of polymer science: nature and structure of organic high-polymers, polymerization reactions, physical and chemical properties, mechanical testing, viscoelasticity, flow and processing applications. **(3 cr)** *Sem 2. Prereq: CHE 2232, CHM 3412; Coreq: CHM 2212.*

CIVIL AND ENVIRONMENTAL ENGINEERING

Chair and Professor: Mathers

Professors: Chadderton, Christensen, McNichol, Schuster

Associate Professors: Lynch, Traver

Assistant Professors: Abruzzo, Glynn, Nassif, Suri

Office: 139 Tolentine, tel. 519-4960

CEE 2101 Engineering Mechanics I - Statics

Vector analysis of force systems on particles and rigid bodies with particular emphasis on mathematical and physical formulation of principles underlying the solution of engineering problems; vector algebra; friction; centroids and moments of inertia. **(3 cr)** *Sem 1&2. Prereq: PHY 2400, MAT 1505.*

CEE 2102 Engineering Mechanics II - Dynamics

Kinematic and kinetic analysis of particles and rigid bodies using vector calculus; work and energy; impulse and momentum. **(3 cr)** *Sem 2. Prereq: CEE 2101.*

CEE 2103 Mechanics of Solids Stress resultants in bodies from tension, compression, shear, flexure, torsion and temperature stress and strain transformations; combined stresses; load deformation relationships; Euler buckling. **(3 cr)** *Sem 2. Prereq: CEE 2101.*

CEE 2602 Civil Engineering Measurements Two major group projects: environmental study of local stream and test model of bridge truss; "as needed" topics include map skills, photo interpretation, plane surveying, water quality, stream hydraulics, material properties and testing, beam flexure; field trips. Two lecture periods and one laboratory period a week. **(3 cr)** *Sem 1. Prereq: or Coreq: PHY 2400*

CEE 2603 Elementary Surveying (Free Elective) Fundamentals of land surveying as they relate to instrumentation; measurements, elevation determinations; topographic and plot land development; limited construction applications; property surveys and development; deed descriptions. Two lecture periods and one demonstration period a week. **(3 cr)** *Sem 2. Prereq:*

Knowledge of basic trigonometry and plane geometry.

CEE 2702 Probability in Civil Engineering Design

Data reduction techniques, fundamental probability theory, analytical models, resampling techniques and simulation applied to problems in civil engineering. **(3 cr)** *Sem 1. Prereq: or Coreq: MAT 1505, CEE 2101.*

GLY 2805 Geology for Engineers Development and composition of minerals, rocks and soils; geologic structure and deformation of rock masses; weathering, mass wasting, erosion, groundwater, streams, ocean currents and glaciers. **(3 cr)** *Sem 2. Prereq: CEE 2602.*

CEE 3101 Soil Mechanics Properties of soil as an engineering material, stresses in soil masses, slope stability, consolidation and settlement, bearing capacity, seepage and soil stabilization. **(3 cr)** *Sem 2. Prereq: CEE 2103, GLY. 2805; Coreq: CEE 3901.*

CEE 3111 Fluid Mechanics Fluid properties; fluid statics; kinematics of flow; conservation of mass, energy, momentum; dynamic similarity; fluid resistance, boundary layer theory; flow in conduits; lift and drag; potential flow; compressible flow. **(3 cr)** *Sem 1&2. Prereq: CEE 2102, MAT 2500.*

CEE 3211 Transportation Engineering Transportation planning; system modes and roles of government agencies. Facility design: alignment, geometrics, pavement, economic evaluation of alternatives. Operations: capacity, level of service, traffic control, queuing, safety. Rail, air, public and future modes of transportation. **(3 cr)** *Sem 1. Prereq: CEE 2102, CEE 2602.*

CEE 3224 Transportation Facilities Design (Design Elective) Systems engineering application of the planning/design process including conceptual design philosophies, environmental impact evaluations, design of highway and transit facilities. Communication processes and software applications stressed. **(3 cr)** *Sem 2. Prereq: CEE 3211. Coreq: CEE 3924.*

CEE 3401 Structural Mechanics Concepts of stability and determinacy; moment area, conjugate beam and energy principles; indeterminate analysis by method of consistent deformation, slope deflection, moment distribution. **(3 cr)** *Sem 1. Prereq: CEE 2103.*

CEE 3422 Structural Design (Design Elective) Principles of design; limit state design logic and procedures; behavior and design of reinforced concrete and structural steel members; design for tension, compression, shear, and moment; serviceability; design for multiple constraints. Three lecture periods and one analysis-design period a week. **(4 cr)** *Sem 2. Prereq: CEE 2702, CEE 3401.*

CEE 3501 Environmental Engineering I Review of fundamental physical/chemical principles for environmental remediation; environmental regulations; water pollution, eutrophication, dissolved oxygen modeling, computer applications; solid and hazardous waste generation and management. **(3 cr)** *Sem 2. Prereq: CHM 1152, MAT 2500.*

CEE 3511 Hydraulic Engineering and Hydrology Pressure conduits, water and waste water transport, pumping; open channel flow, hydraulic structures; principles of hydrology; computer-aided analysis and design. **(3 cr)** *Sem 2. Prereq: CEE 2702, CEE 3111.*

CEE 3702 Civil Engineering Numerical Analysis Development, application, and programming of algorithms for civil engineering problems. Numerical methods for root finding, simultaneous equations, curve finding, interpolation, integration, and differentiation. **(3 cr)** *Sem 1. Prereq: EGR 1611.*

CEE 3901 Soil Mechanics Laboratory Soil classification; techniques for determining

properties of soil and soil aggregate; case histories in geotechnical engineering; computer applications. **(1 cr)** *Sem 2. One period a week. Coreq: CEE 3101.*

CEE 3911 Fluid Mechanics Laboratory Experiments and demonstrations illustrating principles of flow behavior including computer-aided analysis and interpretation. **(1 cr)** *Sem 1. One period a week. Prereq or Coreq: CEE 3111.*

CEE 3924 Transportation Facilities Design Laboratory (Design Elective) Design making under uncertainty; problems related to geometric design, highway and intersection capacity, and site planning; route location and feasibility study. Software applications. **(1 cr)** *Sem 2. One analysis-design period a week. Coreq: CEE 3224.*

CEE 4225 Advanced Transportation Engineering (CE Elective) Applications of statistics and probability theory to solution of urban and rural transportation problems and the design of systems with software applications and model development. **(3 cr)** *Sem 2. Prereq: CEE 3211.*

CEE 4423 Computer-Aided Structural Engineering (CE Elective) Advanced structural analysis techniques for trusses, beams and frames; energy theorems, matrix formulations and finite element modeling with a commercial software package. **(3 cr)** *Sem 2. Prereq: CEE 3401.*

CEE 4522 Environmental Engineering II (Design Elective) Analysis and design of unit processes in water and wastewater treatment plants including sedimentation, coagulation and flocculation, adsorption, filtration, disinfection, activated sludge, trickling filters, sludge processing and disposal; clean water and safe drinking water acts. **(3 cr)** *Sem 1. Prereq: CEE 3111 and CEE 3501 or permission of instructor; Coreq: CEE 4922.*

CEE 4523 Water Resources Engineering Design (Design Elective) Design storms, open channel hydraulics, design fundamentals using production-level programs, hydraulic structures, flood control works, design projects. Three lecture periods and one analysis-design period a week. **(4 cr)** *Sem 1. Prereq: CEE 3511, CEE 3702.*

College of Engineering

CEE 4605 Civil Engineering Design Project I The principles and techniques of civil engineering design; project planning and proposals; information gathering, storage, organization and retrieval; scheduling; technical writing, oral presentations. **(3 cr) Sem 1. Prereq:** One civil engineering design elective. **Coreq:** One civil engineering design elective.

CEE 4606 Civil Engineering Design Project II The completion, and final written report on approved design projects. **(3 cr) Sem 2. Prereq:** CEE 4605 and two civil engineering design electives.

CEE 4607 Selected Topics in Civil Engineering Independent study or research on a current engineering topic. **(3 cr) Sem 2. Prereq:** Sr. Standing, permission of Chair.

CEE 4701 Economy and Risk Value theory, interest formulas, equivalence calculations, inflation and taxes, comparison among alternatives; decision criteria, risk and uncertainty. **(3 cr) Sem 1. Prereq:** CEE 2702.

CEE 4723 Modeling of Civil Systems (CE Elective) Modeling and decision making techniques applied to specific infrastructure problems; statistics,

simulation, reliability analysis, and optimization. **(3 cr) Sem 2. Prereq:** CEE 3702.

CEE 4821 Geological Engineering (Design Elective) Engineering problems and design in rock masses; geologic structure; rock mechanics; hydrogeology; rock engineering and design. **(4 cr) Sem 1. Three lecture periods and one analysis-design period a week. Prereq:** CEE 3101, CEE 3111.

CEE 4922 Environmental Engineering Laboratory (Design Elective) Physical, chemical, and microbiological analyses of water and wastewater; quantitative analysis of several unit operations and processes for water and wastewater treatment plants design and control; field trips to solid waste, water, and wastewater processing facilities. **(1 cr) Sem 1. Coreq:** CEE 4522.

CEE 5602 Architecture and Engineering in Building Design (Free Elective) Role and relation between the architect and engineer in the design of buildings using real world building design applications; architectural design requirements; relation of engineering systems to building design. **(3 cr) Sem 2. Prereq:** Senior Standing.

ELECTRICAL AND COMPUTER ENGINEERING

Chair and Professor: Rao

Professors: Amin, Buckley, Zygmunt

Associate Professors: Bukowski, Caverly, DiMeo, Hoorfar, Kozikowski,
Kresch, Mattis, Mobasseri, Perry, Singh

Assistant Professors: Jupina, Konyk, McKeough, Mercedes

Office: 411 Tolentine, tel. 519-4970

ECE 2190 Electrical Circuits Kirchhoff's laws, circuit elements, sources, op-amps; node and mesh analysis, circuit theorems; phasors, impedance, ac power. Practicum includes laboratory experience, computer simulations, problem solving, and circuit design. **(4 cr)** *Sem 1. Prereq: MAT 1505, PHY 2400; three lecture hours and a two-hour practicum a week.*

ECE 2210 Electrical Circuits and Systems AC circuit analysis, three-phase circuits, transfer functions, Bode plots, filters, natural response, step and impulse response, Laplace transforms, two-port networks. **(3 cr)** *Prereq: ECE 2190, ECE 2409, MAT 2705.*

ECE 2290 Electrical Circuits and Systems Three-phase circuits, transfer functions, Bode plots, filters, natural response, step and impulse response, state equations, convolution, Laplace transforms, two-port networks. Practicum includes laboratory experience, computer simulations using MATLAB, problem solving, and open-ended projects. **(4 cr)** *Sem 2. Prereq: ECE 2190, MAT 2705. Three lecture hours and a two-hour practicum a week.*

ECE 2409 Fundamentals of MATLAB Use of MATLAB, a matrix oriented, high level programming language, for the simulation and modeling of physical systems. Matrix operations, extensive 2-dimensional and 3-dimensional graphing, introduction to MATLAB toolboxes. Lectures are conducted in parallel with hands-on-programming and computer simulations. **(2 cr)** *Sem 1. One lecture hour and one laboratory period a week.*

ECE 2420 Engineering Programming and Applications Topics in C programming; file

input/output, error recovery, bit operators, pointers, dynamic memory allocation, structures, functions and function operators. Applications: engineering numerical computations, Boolean algebra, circuits, signal processing. **(3 cr)** *Sem 2. Prereq: EGR 1611, ECE 2490, or permission of instructor.*

ECE 2490 Digital Systems and Computers Computer arithmetic, Boolean algebra, logical design, assembly language programming, basic concepts of computer architecture. Practicum includes laboratory exercises on logic design and programming the 68000 microprocessor. **(4 cr)** *Sem 1. Three lecture hours and a two-hour practicum a week.*

ECE 2510 Electronics I Diodes, bipolar and field-effect transistors, rectifiers, waveshapers, power supplies, timing circuits, logic design, discrete and IC digital circuits. Computer simulations. **(3 cr)** *Sem 1&2. Prereqs: ECE 2190, 2490*

ECE 2915 Electrical Engineering Laboratory I Introduction to CAE tools; operation of advanced instruments; measurement and study of diodes, bipolar transistors and MOS devices; implementation of logic functions using digital integrated circuits; troubleshooting techniques. **(2 cr)** *Sem 1&2. Prereqs: ECE 2190, 2490. Coreq: ECE 2510. One lecture hour and one laboratory period a week.*

ECE 3420 Expert Systems Programming Functional, rule-based, and object-oriented features of CLIPS. Forward chaining using CLIPS. Backward chaining using PROLOG. **(3 cr)** *Sem 2. Prereq: EGR 2420.*

ECE 3480 Digital Systems Engineering Advanced logic design, state machines, digital

systems design, computer-aided design. Emphasis on VLSI circuits. **(4 cr)** *Sem 1. Prereqs: ECE 2420, 2490. Three lecture hours and a two-hour practicum a week.*

ECE 3490 Microcomputer Systems Assembly language programming and hardware interfacing of a 16-bit micro-processor. Practicum includes laboratory exercises in assembly language programming, and the interfacing and programming of peripheral elements. **(4 cr)** *Sem 1&2. Prereq: ECE 2490. Three lecture hours and a two-hour practicum a week.*

ECE 3510 Electronics II Analog electronic circuits such as amplifiers, power circuits, filters, and oscillators. Computer simulation. **(3 cr)** *Sem 1. Prereqs: ECE 2290, 2510.*

ECE 3590 Semiconductor Materials and Devices Physics of atoms and electrons, crystal structures, energy bands, charge carriers in semiconductors, Fermi level, pn junction, space charge, diodes, bipolar junction transistors and field effect transistors. **(4 cr)** *Sem 2. Prereqs: ECE 2510, PHY 2402. Three lecture hours and a two-hour practicum a week.*

ECE 3690 Engineering Electromagnetics Maxwell's equations, plane waves, dissipative media, reflection and transmission of waves at an interface, metallic and optical wave-guides, transmission lines, linear and array antennas. Practicum includes computer projects, laboratory demonstrations and problem solving. **(4 cr)** *Sem 1. Prereqs: PHY 2402, MAT 2500. Three lecture hours and a two-hour practicum a week.*

ECE 3720 Engineering Probability and Statistics Discrete and continuous random variables, moments and conditional statistics, random processes, Markov chains, queuing theory. Computer simulation projects include random numbers and random variables, modeling of probabilistic experiments, and statistical analysis of random data. **(3 cr)** *Sem 2. Prereq: ECE 2290.*

ECE 3790 Signal Processing Signal representation, Fourier series, Fourier transform, discrete-time systems, convolution, discrete-time

Fourier transform, Z-transform. Practicum includes MATLAB exercises on transform properties and their use in modulation and filtering. **(4 cr)** *Sem 1&2. Prereqs: ECE 2290. Three lecture hours and a two-hour practicum a week.*

ECE 3915 Electrical Engineering Laboratory II Continued use of CAE tools; parameters used to specify discrete and integrated active circuits; design of timing circuits, signal conditioners, amplifiers, and op-amp circuits; troubleshooting techniques; development of oral and technical writing skills. **(2 cr)** *Sem 1. Prereq: ECE 2915. Coreq: ECE 3510. One lecture hour and one laboratory period a week.*

ECE 3950 Electrical Engineering Design Seminar Areas and career paths in electrical engineering. Overview of required senior project courses and faculty project sponsors. Engineering design, project selection requirements, technical communications, information gathering. Requires selection of design project adviser, project topic, and a formal written project proposal. **(2 cr)** *Sem 2. Prereq: Jr. Standing.*

ECE 3951 Computer Engineering Design Seminar Areas and career paths in computer engineering. Overview of required senior project courses and faculty project sponsors. Engineering design, project selection requirements, technical communications, information gathering. Requires selection of design project adviser, project topic, and a formal written project proposal. **(2 cr)** *Sem 2. Prereq: Jr. Standing.*

ECE 4290 Engineering System Models and Control Modeling and analysis of electrical, mechanical, and electromechanical systems; open-loop and feedback systems; frequency domain models; state equations; linearization; time response; steady-state error; block diagrams and signal flow graphs; stability criteria; root locus method. Practicum includes laboratory experiments involving actual engineering systems. **(4 cr)** *Sem 1. Prereqs: ECE 2290, PHY 2402. Three lecture hours and a two-hour practicum a week.*

ECE 4420 Reliability With Engineering Applications Introduction to the theory and practice

of reliability evaluation. Reliability function, hazard rates, MTTF, component reliability, reliability network modeling, various approaches to reliability evaluation, reliability of systems with repair, MTBF, approximations to systems reliability, introduction to software reliability. **(3 cr)** *Sem 1. Prereq: ECE 3720.*

ECE 4790 Electrical Communications Analog and digital communications systems: characterization of communication channels, bandwidth and signal distortion; AM and FM, FM stereo and Dolby noise reduction; sample and hold, source encoding, matched filtering, digital modulations and error control coding. Practicum includes analysis and simulation of products such as compact discs and high speed modems. **(4 cr)** *Sem 1. Prereqs: ECE 3790, 3720. Three lecture hours and a 2-hour practicum a week.*

ECE 4950 Electrical Engineering Project I Electrical engineering design process including specifications, tradeoffs, revisions, economic constraints, organization, scheduling, test plans. Project reconfirmation from ECE 3950. Requirements: progress reports, written interim project report, oral presentation. Each design group meets once a week with adviser. **(2 cr)** *Sem 1. Prereq: ECE 3950.*

ECE 4951 Computer Engineering Project I Computer engineering design process including specifications, tradeoffs, revisions, economic constraints, organization, scheduling, test plans. Project reconfirmation from ECE 3951. Requirements: progress reports, written interim project report, oral presentation. Each design group meets once a week with adviser. **(2 cr)** *Sem 1. Prereq: ECE 3951.*

ECE 4990 Electrical Engineering Project II Completion of the design project presented in ECE 4950. Requirements: written and oral progress reports, demonstration of achieved objectives, formal written final report, oral presentation. Each design group meets once a week with their adviser. Class meets once a week with coordinator. **(4 cr)** *Sem 2. Prereq: ECE 4950. One recitation hour a week.*

ECE 4991 Computer Engineering Project II Completion of the design project presented in ECE 4951. Requirements: written and oral progress

reports, demonstration of achieved objectives, formal written final report, oral presentation. Each design group meets once a week with their adviser. Class meets once a week with coordinator. **(4 cr)** *Sem 2. Prereq: ECE 4951. One recitation hour a week.*

ECE 5091 Special Topics in Electrical Engineering Topics of current interest and importance in electrical engineering, including an examination of pertinent literature. **(3 cr)** *Sem 1.*

ECE 5092 Special Topics in Electrical Engineering Topics of current interest and importance in electrical engineering, including an examination of pertinent literature. **(3 cr)** *Sem 2.*

ECE 5390 Control System Design Problem formulation, design techniques and evaluations, time domain and frequency domain design methods. Incorporates computer-aided analysis and design in conjunction with required laboratory projects. **(4 cr)** *Sem 2. Prereq: ECE 4290. Three lecture-recitation hours and a two-hour laboratory a week.*

ECE 5420 Computer Software Interfacing Introduction to the C programming language. String handling, text file processing, operating system calls, recursion, dynamic data structures, and matrix operations. **(3 cr)** *Sem 2. Prereqs: ECE 2490, MAT 2705.*

ECE 5430 Microcomputer System Design Design and construction of a functional microcomputer using a lab trainer, a set of integrated circuit chips, a microprocessor, RAM, ROM, and interface components. **(3 cr)** *Sem 2. Prereq: ECE 3490.*

ECE 5443 Expert Systems Expert systems programming; rule-based, fuzzy logic, and object oriented features of CLIPS. **(3 cr)** *Sem 2. Prereq: Permission of instructor.*

ECE 5447 Neural Networks and Fuzzy Systems Methodologies of neural networks and fuzzy logic, MATLAB implementation, neural network architectures, applications of fuzzy logic. **(3 cr)** *Sem 2. Prereq: Permission of instructor.*

ECE 5450 Microcontrollers and Applications Architecture of an 8-bit microcontroller, I/O ports,

serial interface, external memory and I/O, A/D converters, UARTS, pulse width modulators. **(3 cr)**
Sem 1. Prereq: ECE 3490.

ECE 5458 Motion Control and Robotics

Components, mathematics, and software used in motion control and robotics. Laboratory work will include programming in the Forth language. **(3 cr)**
Sem 1. Prereq: Jr. Standing.

ECE 5460 Introduction to VLSI Design Design disciplines for Very Large Scale Integration, switching models of MOS systems, basic device equations, combinational and sequential systems design, simulation, timing verification. UNIX CAD VLSI tools will be used for projects. **(3 cr)** *Sem 1. Prereq: ECE 3480.*

ECE 5471 Applied Digital Image Processing

Camera models; lighting techniques and optics; image acquisition hardware; image enhancement, restoration, and segmentation; geometric operations including warping and morphing; pattern classification; 3D scene analysis; shape recognition from stereo, motion texture and shading. Applications to visual inspection, robot guidance and control, medical imaging, reconnaissance, remote sensing. **(3 cr)** *Sem 1. Prereq: Sr. Standing.*

ECE 5475 Computer Data Communications and Networks Communication links, transmission over voice grade circuits, channel capacity and packet switching, multiplexing, synchronization, error correction, satellite communications, optical fiber transmission. **(3 cr)** *Sem 1. Prereq: ECE 3490.*

ECE 5484 Advanced Digital System Design In-depth treatment of combinational logic design, state machine design, and systems-level design. CAD tools, hardware description languages (VHDL) for design and simulation, field programmable gate arrays (FPGA). **(3 cr)** *Sem 1. Prereq: ECE 2490.*

ECE 5520 Audio Engineering Selected topics in audio engineering and acoustics, tied together through their application to the problem of high-quality transmission of sound. **(3 cr)** *Sem 1. Prereq: ECE 3790.*

ECE 5540 Digital Integrated Electronics

Implementation and design of high speed bipolar and MOS digital integrated circuits. TTL, ECL, CMOS, and BiCMOS logic families. Emphasis on practical design issues involving signal integrity and interfacing between logic families. **(3 cr)** *Sem 2. Prereq: ECE 2510.*

ECE 5545 Microelectronic Fabrication Basic fabrication processes of silicon microelectronic circuits. Interrelationships between the material processing and the operational characteristics of a device. Integration of the various material processes in forming bipolar and MOS integrated circuit technologies. **(3 cr)** *Sem 2. Prereq: ECE 3590.*

ECE 5560 Analog Systems I Modeling of active and passive components, characterization of IC subcircuits and their applications, theory and application of op-amps in analog circuit design. Use of manufacturer's data sheets, use of CAE tools for analog circuit design and simulation, practical aspects of design are emphasized. **(3 cr)** *Sem 1. Prereq: ECE 3510.*

ECE 5565 Analog Systems II Advanced topics in analog circuit design. Linear and switching power supplies, regulators, filter specifications, design and sensitivity analysis, oscillators, A/D and D/A converters, VFC, FVC, opto-coupler/isolators, waveshaping circuits. Application of CAE tools for design, simulation and verification. Practical aspects of design and trouble shooting techniques are emphasized. **(3 cr)** *Sem 2. Prereq: ECE 3510.*

ECE 5680 Photovoltaic Power Generation Nature and availability of solar energy; solar cell design, including materials selection; photovoltaic modules and arrays; inverters; stand-alone systems; grid interconnection; economic considerations. **(3 cr)** *Sem 1. Prereq: ECE 3590.*

ECE 5690 Microwave Networks Plane wave propagation; propagation in TEM transmission lines and waveguides; IMPATT; TRAPAT; Gunn-Effect and parametric devices; microstrip lines and microwave integrated circuits; laboratory work includes measurement of SWR, impedance, and power at microwave frequencies. **(4 cr)** *Sem 2. Prereq: ECE 3690.*

ECE 5750 Communications Electronics Analysis of circuits used in radio frequency communication transmitters and receivers. Elements of radio systems, electrical noise, modulation, detection, oscillators, mixers, power amplifiers, design. (3 cr) *Sem 1. Prereqs: ECE 3510.*

ECE 5760 Introduction to Optoelectronics Introduction to various optoelectronic devices, including light emitting devices, photodetectors, optical modulators, solar cells and display devices. Applications to systems. (3 cr) *Sem 1. Prereq: ECE 3590 or permission of the instructor.*

ECE 5790 Digital Signal Processing Review of discrete-time signals and systems; design and implementation of digital filters; Fast Fourier transform algorithms and applications; introduction to statistical signal processing; computer-aided design projects. (4 cr) *Sem 1. Prereq: ECE 3790.*

ECE 5810 Power Systems Three-phase circuits and power, transmission line parameters and models, transformer models, the per-unit system, power flow analysis, synchronous generator models. (3 cr) *Sem 1. Prereq: ECE 2290.*

ECE 5820 Operation of Electric Power Systems Economic operation, system stability, unbalanced fault analysis, protective relaying, voltage control, power line communication, power control. (3 cr) *Sem 2. Prereq: ECE 5810.*

ECE 5991 Electrical Engineering Research I Students work with faculty on current research topics. Weekly meetings with faculty adviser and a final written report and/or oral presentation are required. (3 cr) *Sem 1. Prereq: Sr. standing, approval of potential adviser.*

ECE 5992 Electrical Engineering Research II

Continuation of ECE 5991. (3 cr) *Sem 2. Prereq: Sr. standing; approval of potential adviser.*

ECE 6020 Introduction to Electrical Systems A survey course for non-electrical engineering students. Electrical components, dc circuits, ac circuits, power systems, electric machines, analog and digital electronics. (3 cr) *Sem 1&2. Prereq: PHY 2402.*

The following 7000 series courses can be taken with the permission of the Chairperson

ECE 7500 Fundamentals of Solid State Electronics Solid state electronics concepts including semiconductor device physics, microelectronic fabrication, and SPICE modeling. Topics include quantum well structures, semiconductor physics, pn junctions, bipolar and field effect transistors, photolithography, oxidation, diffusion, and computer simulation of semiconductor devices. (3 cr)

ECE 7525 Electronic Measurements and Conversion This course is meant for electrical engineering students. It will introduce the student to practical methods for the conversion and measurement of physical quantities by the use of transducers and electronic circuits. The underlying technology of the typical electronic measurement system will be studied. Emphasis will be given on the role the electrical engineer has in designing instrumentation. (3 cr)

ECE 7720 Audio-Frequency Systems System objectives and requirements for the generation and transmission of audio-frequency signals, especially music and speech. Signal-processing techniques used to attain such objectives. Analysis of selected system components in relation to system objectives. (3 cr)

ENGINEERING COURSES

EGR 1610 Engineering Design Graphics Introduction to engineering and design; the design process; fundamental principles of orthogonal

projection; practical problems in descriptive geometry; orthographic and isometric drawing and sketching; conceptual design project; computer

graphics. (3 cr) *Sem 1&2.*

EGR 1611 Engineering Analysis Introduction to computer programming using ANSI C, numerical methods; basic concepts of computer operations; use of the computer to solve engineering type problems. (3 cr) *Sem 1&2.*

EGR 2001 Engineering: The Humanistic Context A study of selected engineering achievements with emphasis on their technological innovations and impacts on society. Several case studies are

examined to explore the connections between specific engineering achievements such as the computer, the DC-10, the Brooklyn Bridge, nuclear power, toxic waste disposal, and specific aspects of society, including political arrangements, art, the media, historical trends, social attitudes, and the role of specific individuals. (3 cr) *Sem 1&2. Prereq: Minimum of 34 earned credits toward a Bachelor of Engineering Degree.*

MECHANICAL ENGINEERING

Chair and Professor: Whitman

Professors: Majerus, McAssey, McLaughlin

Associate Professors: Ashrafiuon, Chun, Jen, Jones, Kroos,
Nataraj, Radhakrishnan.

Assistant Professors: Baker, Harrington, Koffke, O'Brien, Santhanam

Industrial Professor: Casey

Office: 111 Tolentine, tel. 519-4980.

ME 2000 Independent Study Course provides opportunity for sophomore students to work on independent study projects such as Space Shuttle experiment. (1 cr) *Sem 1. Elective. Prereq: Soph. Standing.*

ME 2113 Manufacturing Engineering Principles and processes of machining, metal forming, metal casting and welding; machine tools, material design, and economic considerations in manufacturing; metrology; current trends in manufacturing. (3 cr) *Sem 2. Coreq: CEE 2101.*

ME 2500 ME Analysis and Design I Units and dimensions; The Design Process; Engineering Economics; Introduction to Probability and Statistics; Experimental Design; Introduction to modeling and problem solving using case studies. (3 cr) *Sem 1. Prereq: MAT 1505 and EGR 1611.*

ME 2501 ME Analysis and Design II Numerical and analytical solutions of Mechanical Engineering design problems involving series techniques, integration, curve-fitting, root-finding, analytic geometry, linear algebra, and ordinary differential

equations (initial-value-problems). (3 cr) *Sem 2. Prereqs: MAT 2500 and ME 2500.*

ME 2901 ME Laboratory I Experiments related to manufacturing processes, basic CNC/Robotics and mechanical/electrical measurements. (2 cr) *Sem 2. Coreq: ME 2113.*

ME 2950 Materials Testing The A.S.T.M. standards and procedures in physical tests of various materials; determination of the physical properties of materials by destructive and non-destructive tests. (1 cr) *Sem 2. Coreq: CEE 2103.*

ME 3000 Independent Study Independent study for junior students on various projects such as the Space Shuttle. (1 cr) *Sem 1. Elective. Prereq: Jr. Standing.*

ME 3001 Independent Study Independent study for junior students on various projects such as the Space Shuttle. (1 cr) *Sem 2. Elective. Prereq: Jr. Standing.*

ME 3100 Thermodynamics I Elements of

thermodynamics theory; systems and control volumes, properties of pure substance, ideal gas, heat and work interactions, first and second laws, concept of entropy. **(3 cr)** *Sem 1. Prereq: MAT 2500.*

ME 3101 Thermodynamics II Applications of thermodynamics theory of power and refrigeration cycles; mixtures; elements of psychometry; combustion, Maxwell Relations, equilibrium. **(3 cr)** *Sem 2. Prereq: ME 3100.*

ME 3200 Machine Design Design and analysis of machine elements; cams, shafts, springs, screws; welded and riveted connections, lubrication; bearings; gears and transmissions; computer-aided design, design project lab. **(4 cr)** *Sem 2. Prereq: ME 3401.*

ME 3300 Materials Science I Introduction to atomic and molecular structure; origin of cohesive forces; micro and macro structures of crystalline, and amorphous materials; mechanical properties; nature and influence of defects; physics of electrical, magnetic, and thermal properties; fundamentals of solid science applied to metals, ceramics, and polymers. **(3 cr)** *Sem 1. Prereq: CHM 1152; CEE 2103.*

ME 3401 Stress Analysis I Stress, strain, stress-strain relations, strain gauges; stress concentration; static and fatigue failure analysis; curved beams; torsion of non-circular sections; energy theorems. **(3 cr)** *Sem 1. Prereq: CEE 2103.*

ME 3500 ME Analysis and Design III Application of eigenvalue/vector problems in dynamics; introductions to: boundary value problems in stress analysis, heat transfer, and vibration; design optimization; kinematics of linkages. **(3 cr)** *Sem 1. Prereq: MAT 2705, ME 2501.*

ME 3902 ME Laboratory II Test of engineering materials, experiments related to basic stress analysis, thermodynamics, and materials science. **(2 cr)** *Sem 1. Coreq: ME 3401, 3300.*

ME 3903 ME Laboratory III Experiments related to vibrations, fluid mechanics, and thermodynamics. Computer data acquisition and data analysis. **(2 cr)**

Sem 2. Coreq: ME 3101, 5202, CEE 3111.

ME 4101 Heat Transfer I Steady state, unsteady state conduction in one and two dimensions; forced and free convection; black and grey body emission and absorption of radiant energy, geometric configuration factors. **(3 cr)** *Sem 1. Prereq: MAT 2705, ME 3100. Coreq: CEE 3111.*

ME 4102 System Dynamics Lumped modeling of basic physical systems; modeling of electromechanical and other combined physical systems; analysis of free and forced response; transfer functions; frequency. **(3 cr)** *Sem 2. Prereq: MAT 2705*

ME 4800 Design Seminar in ME I Product design; technical, economic, safety, producibility and environmental considerations; role of codes and standards; optimization, reliability, maintainability; human factors, scheduling, planning and estimating. **(1 cr)** *Sem 1.*

ME 4801 Design Seminar in ME II Continuation of ME 4800; design review process; oral presentation of design projects, preparation of final design report. **(3 cr)** *Sem 2. Prereq: ME 4800; Coreq: ME 4101, 3200.*

ME 4901 ME Laboratory IV Experiments related to heat transfer in forced and natural convection and vibrations. Performance testing of internal combustion engine. **(2 cr)** *Sem 1. Coreq: ME 4101, CEE 3111.*

ME 5000 Selected Topics in ME Independent study or research on a current engineering topic. **(3 cr)** *Sem 1. Elective. Prerequ: Sr. Standing, and permission of chairperson.*

ME 5100 Heat Transfer II Selected topics in heat transfer and fluid flow; boundary layers and turbulence; thermal stresses; similitude; special methods. **(3 cr)** *Sem 2. Elective. Prereq: ME 4101.*

ME 5101 Elements of Aerodynamics The standard atmosphere, two-dimensional incompressible flow, Reynolds and Mach number, generation of lift based on airfoil and wing platform characteristics, drag force, propulsive force, overall airplane performance,

static stability and control. **(3 cr)** *Sem 2. Elective.*
Prereq: CEE 3111, ME 3100.

ME 5102 Compressible Fluid Flow Foundations of fluid dynamics; isentropic flow; normal shock waves; flow in constant-area ducts and friction; flow with heat exchange; unsteady flow. **(3 cr)** *Sem 1 or 2. Elective. Prereq: CEE 3111, ME 3100.*

ME 5104 Energy Conversion Cost of electricity; elements of power generating systems; fuels fossil and nuclear fuel power plants; power plant environmental impact. **(3 cr)** *Sem 1. Elective.*
Prereq: ME 3101.

ME 5105 Prime Movers Elements of steam and gas turbine design; internal combustion engines; thermodynamics of combustion; combustion charts; applications. **(3 cr)** *Sem 1 or 2. Elective. Prereq: ME 3101.*

ME 5107 Environmental Engineering The engineering principles underlying the current practices of heating, ventilating, air conditioning, and refrigeration systems design. **(3 cr)** *Sem 2. Elective. Prereq: ME 3101.*

ME 5120 Environmental Control - Air Quality
The objective of this course is to provide students with a fundamental understanding of environmental issues related to air quality. The course is divided into three major areas: sources of pollution, method of control, and air quality standards and regulations. **(3 cr)** *Sem 2. Elective.*

ME 5200 Stress Analysis II Non-symmetrical bending, thin and thick walled pressure vessels, rotating discs and cylinders; thermal stress and strain; buckling of bars and plates; elementary plasticity; energy methods; numerical stress analysis methods. **(3 cr)** *Sem 1 or 2. Elective.*
Prereq: ME 3401, 2501.

ME 5201 Intro to Finite Elements and Their Applications Basic concepts of finite-element method, method of weighted residual, 1-D axial and beam elements, 2-D stress and thermal elements, design projects via commercial codes. **(3 cr)** *Sem 1 or 2. Elective. Prereq: ME 3401, Coreq: ME 4101.*

ME 5202 Vibrations Free vibration of simple vibrating systems; harmonic excitation; transient vibration; introduction to multi-degree-of-freedom systems; normal modes; random vibration; application. **(3 cr)** *Sem 2. Prereq: MAT 2705, ME 2501, CEE 2102.*

ME 5203 Introduction to Automatic Control Modeling of dynamic systems; transfer functions, block diagrams; state vector concepts; feedback control; transient and frequency response; stability and root locus; controller design with output feedback. **(3 cr)** *Sem 1. Elective. Prereq: CEE 2102, MAT 2705, ME 2501.*

ME 5204 Dynamics of Flight Static stability and control of aircraft; equations of unsteady motion; stability derivatives; uncontrolled longitudinal and lateral motion; open loop control mechanisms; closed loop control concepts. **(3 cr)** *Sem 2. Elective. Prereq: CEE 2102, MAT 2705, ME 2501.*

ME 5300 Advanced Topics in Materials Science Techniques for studying microstructures and failure of materials, reflected light microscopy, scanning electron microscopy, transmission electron microscopy, field ion microscopy, energy-dispersive spectroscopy, failure analysis. **(3 cr)** *Sem 1 or 2. Elective. Prereq: ME 3300.*

ME 5301 Fracture and Fatigue Failure; structure of materials; stress-strain equations; mechanical testing; yielding & fracture; fracture of cracked members; fatigue of materials; stress-based approach to fatigue; fatigue crack growth; creep. **(3 cr)** *Sem 1 or 2. Elective. Prereq: ME 3300, 3401.*

ME 5420 Computer Aided Mechanism Design Modeling, analysis, and design of mechanical systems such as automobile suspension systems, machinery, compressors, linkages, gears, cams, robots, etc.; analytical and computational methods in kinematics and dynamics; extensive use of commercial software. **(3 cr)** *Sem 2. Elective.*
Prereq: CEE 2102, ME 3200, ME 3500.

ME 5430 Computer Graphics Principles of computer graphics as supplied to the engineering profession. Topics such as manipulation of images, curve and surface fitting, hidden line removal, and

shading will be covered. (3 cr) *Sem 1. Elective.*
Prereq: EGR 1610, 1611.

ME 6621 Legal Problems in Engineering American legal system; fundamentals of contracts, agency and business associations, engineer's responsibilities; real property; zoning laws and building codes; construction contracts, mechanical contracts; subcontracts and pricing; surety bonds; arbitration; machinery and equipment contracts; patents and trade secrets. (3 cr) *Professional Development Elective.*

The following 7000 series can be taken with the permission of the chair.

ME 7000 Advanced Engineering Analysis Solutions of ordinary differential equations; series solutions, special functions; boundary-value problems; partial differential equations; vector calculus; calculus of variations; engineering applications. (3 cr) *Sem 1.*

ME 7001 Numerical Analysis Root finding techniques, determinants and simultaneous equations, methods for solution of eigenvalue problems, solutions for ordinary and partial differential equations, optimization using linear programming techniques; programming of typical problems on the digital computer. (3 cr) *Sem 2.*

ME 7038 Introduction to Computational Fluid Mechanics Discretization, boundary conditions, solution methods, heat transfer, flow with known pressure field, calculation of pressure field, applications program, special topics. (3 cr)

ME 7050 Materials Processing Analysis of Materials Processing methods. Introduction to principles of plasticity; yield criteria; upper and lower bound methods; slip line field analysis; analysis of a selection of manufacturing processes from forging, rolling, metal-cutting, grinding; numerical solutions. (3 cr)

ME 7100 Thermodynamics Microscopic development of thermodynamics, kinetic theory, statistical models, development of physical properties using quantum theory. (3 cr)

ME 7106 Introduction to Nuclear Engineering Introduction to reactor theory; reactor design including heat transfer and fission requirements; environmental site selection. (3 cr)

ME 7110 Radiation and Thermal Control Fundamentals of radiant heat transfer; diffuse and non-diffuse radiation; modern techniques for determining configuration factors and temperature response; applications to spacecraft thermal control. (3 cr)

ME 7200 Applied Optimal Design Modern optimization techniques and related numerical methods used to solve engineering design problems; linear programming, simplex method; nonlinear optimization, Lagrange multipliers, Kuhn-Tucker conditions, search techniques; computer programming. (3 cr)

ME 7204 Computer-Aided Analysis of Multibody Systems Kinematic and dynamic analysis and design of mechanical systems; computer simulation and design of multibody systems such as automobiles, engines, compressors, cam-followers, robots, etc. (3 cr)

ME 7205 Advanced Dynamics Particle dynamics; system of particles; impulse and momentum; energy concepts; Lagrange's equations; kinematics of rigid body motion; dynamics of a rigid body. (3 cr)
Prereq: ME 7000.

ME 7206 Dynamics of Rotating Machinery Coordinate systems and kinematics of rotor motion; critical speeds and unbalance excitation; effect of asymmetry in rotor and stator, gyroscopic effect; stability and energy concepts; hydrodynamic bearings; Finite Element Modeling; nonlinear phenomena in machinery. (3 cr)

ME 7300 Introduction to Design with Plastics Thermal/mechanical/physical behavior, manufacturing techniques, special design theories; viscoelasticity, time-temperature superimposition, Correspondence and Boltzmann principles, and linear fracture mechanics. (3 cr)

ME 7350 Statistical Methods in Manufacturing An introduction to the basic statistical principles

and methods used in manufacturing to enhance the quality of products. The focus will be on Statistical Process Control, Design of Experiments, and Acceptance Sampling. **(3 cr)**

ME 7400 Introduction to Computer-Aided Manufacturing Production line analysis, line balancing, group technology, MRP, numerical control, robotics, automated inspection and material handling. **(3 cr)** *Sem 1.*

ME 7401 Numerical Control and Robotic Applications Principles, types and features of NC systems; NC programming; CNC and DNC; principles and configurations of industrial robots; robot programming; end-effectors and sensors for robots; manufacturing applications of robots; justification of NC and robot systems. **(3 cr)** *Sem 2.*

ME 7402 Computer-Aided Production Planning Static and dynamic production planning models, operations scheduling, inventory control, forecasting, queuing theory. **(3 cr)**

ME 7501 Reinforced (Composite) Materials Particulate, filamentary, short-fiber, and laminated composites; elastic, plastic, and thermal structure/property relationships; stress analysis and design of material systems; static and fatigue failure; destructive and NDE test techniques. **(3 cr)**

ME 7502 Fiber Composite Structures--Analysis and Design Orthotropic stress-strain relations, hygrothermal effects; laminate analysis, manufacturing residual stresses; stress analysis, finite element analysis; composite structure static and fatigue failure; designing, joining, and repair. **(3 cr)** *Prereq: ME 7001 or equivalent.*

COLLEGE OF NURSING

M. Louise Fitzpatrick, Ed.D., Dean

Rose M. O'Driscoll, M.S.N., Assistant Dean

Andrea O. Hollingsworth, Ph.D., Director of Undergraduate Program

"The health care of a complex and technologically advanced society requires professional nurses who are liberally educated, clinically competent, compassionate and ethically motivated. In responding to these objectives, the College of Nursing is a tangible expression of Villanova's mission, values and commitment to human service."

HISTORY

Villanova University first responded to society's need for baccalaureate-prepared nurses in 1932 when it offered a program of study leading to a Bachelor of Science in Nursing Education. This commitment was expanded in 1953 to create a College of Nursing that now offers a generic BSN program, a BSN completion program for registered nurses, an MSN program, and a Continuing Education Program.

Baccalaureate nursing education prepares individuals for professional nursing practice in a variety of health-care settings and for continuous personal and educational growth, including entrance into graduate education in nursing. A liberal education is integrated with the ideals, knowledge, and skills of professional nursing practice under the direction of well-qualified faculty.

The College of Nursing is approved by the State Board of Nurse Examiners of the Commonwealth of Pennsylvania, and upon completion of the undergraduate program, graduates are eligible to take the National Council Licensure Examination (NCLEX-RN) for licensure as professional registered nurses. Both the undergraduate and graduate programs are fully accredited by the National League for Nursing; the Continuing Education Program is accredited by the American Nurses Association.

OBJECTIVES

The College of Nursing is a tangible expression of Villanova University's mission, tradition, and commitment to human service. As a major school of nursing under Catholic auspices, it carries responsibility for the education of nurses within the framework of Christian beliefs, values, ethical principles and the heritage of the Order of St. Augustine. The academic programs in the College of Nursing are directed to the interpretation of nursing as a healing ministry and demonstrated through service and the care of others. As a healing art as well as an applied science and practice discipline, nursing emphasizes the concern for spiritual health as well as that of mind and body. Curricula reflect the integration of these elements and their application in clinical practice and concern for others regardless of race, ethnicity or religion.

The practice of nursing within a Christian environment requires that those who nurse recognize and respect the needs of each person and that they teach while they nurse in order to assist their patients and the community to achieve the highest possible level of wellness of body, mind and spirit.

The College of Nursing is committed to providing high quality education in the liberal arts and sciences and expert preparation in the knowledge and clinical skills of professional nursing to qualified individuals who must be prepared and empowered to confront the health care demands of a complex and technologically advanced society.

DEGREES AND PROGRAMS

The College awards the baccalaureate degree in nursing (BSN) and provides basic preparation in nursing to those who are studying for the first professional degree in the field. Such students include high school graduates with no prior college experience, registered nurses who were prepared in hospital or junior college programs and who have not yet attained the baccalaureate, college graduates with degrees in other disciplines who have made a late decision to study nursing, and mature adults who are studying for their first college degree.

The Graduate Program awards the master's degree (MSN) and provides preparation and leadership development in selected areas of advanced nursing practice, development of research skills and knowledge of health policy. In addition, course options prepare individuals for positions as administrators of nursing and health services, case managers, clinical teachers, faculty, nurse practitioners and nurse anesthetists.

The Program in Continuing Education is committed to providing short courses, conferences, workshops and symposia for nurses, other health professionals and the public-at-large on topics related to health care. Some of these programs are developed to update the knowledge of practicing nurses while others provide an academic arena for the sharing and critiquing of papers and ideas relevant to current issues or trends in health care.

DEGREE REQUIREMENTS

Bachelor of Science in Nursing Curriculum (136 credits)

FRESHMAN

<i>Fall Semester</i>	<i>credits</i>	<i>Spring Semester</i>	<i>credits</i>
CHM 1131	3	CHM 1134	3
CHM 1103	1	CHM 1108	1
CHS 1000	3	CHS 1001	3
NUR 1101	2	NUR 1103	2
PSY 1000 or SOC 1000	3	SOC 1000 or PSY 1000	3
THL 1050 or PHI 1050	3	PHI 1050 or THL 1050	3
		ENG 1050	3

SOPHOMORE

BIO 1205	4	BIO 1206	4
BIO 1181	3	NTR 2120	3
NUR 2104	2	NUR 2106	2
NUR 2105	1	NUR 2107	2
PSY 2200	3	MAT 1250	3
Elective	3	Soc. Studies Elective*	3

*Must be selected from the areas of History, Political Science, or Economics in consultation with the student's major adviser.

JUNIOR

College of Nursing

NUR 3112	6	NUR 3116	6
NUR 3113	6	NUR 3117	6
NUR 3108	3	NUR 3110	3
NUR 3030	3	PHI 2115	3
SENIOR			
NUR 4101	6	NUR 4102	6
NUR 4103	6	NUR 4107	6
NUR 4130	2	NUR 4110	5
THL Elective**	3		

**2000 level or above is recommended

PROGRAM REQUIREMENTS

1. Entrance physical examination, selected diagnostic tests, as well as designated immunizations, are required of all nursing students. Additional health screening tests may be required by the various agencies utilized for clinical experience in nursing courses.
2. Students are required to be certified in Basic Cardio-pulmonary Resuscitation prior to enrolling in NUR 2106 and 2107. Continuing re-certification is the responsibility of the student throughout the remainder of the program.
3. All materials concerning health examinations, diagnostic tests, immunizations, health screening and cardio-pulmonary resuscitation are course requirements for the following courses: 2107, 3113 (Spring Semester Offering) and 4103. They must be on file in the College of Nursing by the end of the Spring final examination period or prior to the first day of class in the *first semester* of enrollment.
4. All senior students are required to participate in a battery of tests to assess nursing knowledge prior to graduation. The cost is assumed by the students.
5. Registered nurse students must furnish evidence of malpractice liability insurance.

ACADEMIC POLICIES AND INFORMATION

Unless otherwise noted, the College of Nursing follows the general university academic policies and regulations listed in the University section of this *Catalog*. *It is the responsibility of the student to know and comply with all academic policies and regulations of the University and of the College of Nursing and to abide by the professional standards established by the College. Such policies may change without prior notice.* Note: if a student withdraws from the College of Nursing and is readmitted at a later date, the requirements in effect at time of readmission will be applied. Policies and regulations specific to Nursing students include the following:

ADMISSION

Regular Students

All applicants for full-time or part-time study must meet the entrance requirements for admission to the University as listed in this *Catalog*.

Transfer Students

Transfer students with a 2.5 Q.P.A. are considered for admission to the College of Nursing on a limited basis. Please see the section on "Transfer Students" in the general University section of this *Catalog*. Further inquiries should be directed to the College of Nursing.

Adult Students/Second Career Applicants

The College of Nursing welcomes applications from adults who wish to begin preparing for a career in nursing. These include individuals who possess undergraduate and/or graduate degrees in other fields as well as those adults entering college for the first time. Part-time study is possible during the introductory level of the program. Full-time study is required during the clinical portion of the program. All applicants must meet the entrance requirements for admission to the University. Further inquiries should be directed to the College of Nursing.

Registered Nurse Applicants

Graduates from diploma and associate degree nursing programs are eligible for admission. Requirements for admission include: transcripts from all academic institutions including high school, and proof of registered professional nurse licensure. Applicants should apply for admission through the Office of Admissions of the University.

Through a series of nursing examinations and clinical validation, a registered nurse student may demonstrate current nursing knowledge earning 45 credits in nursing. Specific policies and procedures may be obtained through the College of Nursing. Credit by examination is available through the College of Arts and Sciences for non-nursing courses. See the section on Registered Nurses, below.

ACADEMIC ADVISING

Every student entering the College of Nursing is assigned a faculty adviser. It is the responsibility of the student to contact his/her adviser prior to each registration period and if he/she is experiencing any academic difficulty. Each student must take responsibility to meet with his/her adviser on an ongoing basis. Advisers are available during posted office hours or by appointment.

ACADEMIC STANDING AND PROBATION

Standing

For progress toward the Bachelor's degree, students must earn a grade of C or better in all nursing courses. The following regulations are applicable:

- ? Only one nursing course may be repeated in the curriculum prior to dismissal from the program.
- ? A required course may be repeated once prior to dismissal from the program.
- ? Students must complete, in sequence, the required lower division courses with a Q.P.A. of 2.5 in order to advance to junior level courses.

The College of Nursing reserves the right to place on probation or withdraw any student whose performance is deemed unsatisfactory.

Probation

A student is placed on academic probation in the College of Nursing when:

- ? A required course is failed.
- ? A grade less than C is earned in science or nursing courses.
- ? The QPA is below 2.0 in any given semester.

Dismissal

Students are permitted two semesters of probationary status prior to dismissal from the program. A dismissal from the College may be appealed in writing. Detailed instructions for appeal are outlined in the dismissal letter.

In circumstances involving those students who have entered Villanova University through the Academic Advancement Program, satisfactory progress of the student will be determined by the Academic Standing Committee and/or Dean of the College in which the student is matriculated. In the event that, due to poor high

College of Nursing

school preparation, additional time is necessary for the student to complete the requirements towards graduation, the student will be viewed as being in a five-year program. Satisfactory progress will be viewed accordingly.

ACADEMIC GRIEVANCE PROCEDURE

If a student has a grievance within a nursing course, he/she is advised to speak with the individual teaching the course. If the problem is not resolved at this level, it may be taken to the Course Leader, Program Director, and Dean in that order.

ADMISSION TO CLOSED SECTIONS OF COURSES

Students will **not** be permitted to enroll in closed sections. Exceptions to this rule will be made only by the Undergraduate Program Director or Assistant Dean and only when a student must enroll in the specific section in order to complete requirements which are necessary for progression in the program.

GRADUATE COURSE REGISTRATION FOR UNDERGRADUATE STUDENTS

A junior or senior with a 3.00 cumulative quality point average wishing to enroll in a graduate course must have the written approval of the Dean of the College of Nursing before submitting a request to the Dean of the Graduate School (see Undergraduate Regulations for course numbering).

INTERNATIONAL STUDIES

The College of Nursing, in conjunction with the Office of International Studies, is pleased to offer a variety of opportunities for a Nursing major to study in an overseas university during her/his course of studies.

The College of Nursing has established a year-long study abroad program with King's College, London; King's is a constituent college of the University of London. Students in this program spend their entire sophomore year in the Nursing Studies Department of King's College. The courses transfer to Villanova as the Sophomore year of the nursing curriculum and students graduate on time with their classmates.

The program requires some changes in the Freshman course of study; any freshman who is interested should contact the Director of the Undergraduate Nursing Program or his/her academic adviser as soon as possible. A nursing major may also participate in any of the summer or semester study abroad programs approved by the University and administered by the Office of International Studies. However, since these are not nursing programs, students who participate need to change their course of study and may graduate later than their graduation class. Interested students should see the detailed discussion International Studies in the Villanova University section of this *Catalog* or contact the Office of International Studies, St. Augustine Center, Room 415, (phone 610-519-6412).

WITHDRAWAL FROM A COURSE (WX)

After the Friday following mid-term break, students seeking withdrawals from courses without penalty ("WX") must present to the Dean a written request with valid reasons for the request, such as serious personal or medical problems, and recommendations from the instructor of the course. The Dean of the College is the final authority for granting or refusing the exception on the basis of the documentation and recommendations submitted. Students who do not have a justifiable cause to withdraw from a course without academic penalty may still withdraw from the course and receive a grade of "W."

BSN PROGRAM FOR REGISTERED NURSE STUDENTS

Villanova University

Registered nurse students achieve advanced standing in the undergraduate program through transfer of applicable college credits and through successful completion of required validation exams in nursing* and optional challenge exams in selected liberal education courses. Each of these mechanisms is described below.

Requirements

All registered nurse students are expected to have the following on file prior to enrollment in Nursing 3000 and 3005:

1. Entrance Health Examination and Laboratory Studies.
2. Current CPR Certification including resuscitation and choking measures for baby, child, and adult with one man and two-man rescue procedures.
3. Current Pennsylvania R.N. License.
4. Current Malpractice Insurance Certificate.

Transfer of Liberal Education Course Credit

Up to 64 credits in applicable liberal education courses may be transferred from accredited colleges or universities. A grade of “C” or better must have been earned, and courses must be evaluated as equivalent to appropriate Villanova courses.

Credit by Examination (Liberal Education Courses)

Selected liberal education courses may be challenged through the University's Credit by Examination Program. RN students may challenge up to 12 credits in liberal education in accord with the policies and procedures of that program. Information is available from faculty advisers or directly from Dr. Albert Dorley, room 450, St. Augustine Center.

Advisement

RN students are assigned a faculty adviser when admitted to the College and are expected to consult with the adviser on a regular basis.

REQUIRED VALIDATION EXAMS IN NURSING

ACT-PEP

A passing score of 45 must be achieved on each of the following ACT-PEP exams:

- ? Professional Strategies, Nursing (Code #426)
- ? Maternal-Child Nursing, Baccalaureate Level (Code #457)
- ? Adult Nursing (Code #554)
- ? Health Restoration, Area II (Code #477)

ACT-PEP scores are valid for five years. Each exam may be repeated once if necessary. Passing scores must be achieved prior to registration in NUR 3000/3005.

NOTE: A current exception to this requirement is being tested with eligible graduates of the AND programs at Montgomery County Community College, Community College of Philadelphia, Delaware County Community College and Bucks County Community College.

Clinical Validation Examination

This 4-part exam is administered at the conclusion of NUR 3000/3005, and includes both paper-pencil and demonstration testing through case study materials and role-playing. Guidelines for the exam are provided early in the semester in which NUR 3000 and 3005 are scheduled. The exam is evaluated as pass or fail. Each of the four parts may be repeated once if necessary. The entire exam must be passed to progress in the program.

College of Nursing

COURSE/CREDIT REQUIREMENTS (136 credits)

Physical Sciences/Math	(25 crs)	Nursing	(69 crs)
Anatomy & Physiology	(6-8 crs)	ACT-PEP Exams and/or	
Organic/Biochemistry	(3-4 crs)	AAS Nursing Credit Transfer	(26 crs)
Microbiology	(3-4 crs)	NUR 3110*	(3 crs)
Nutrition	(3 crs)	NUR 3000/3005	(4 crs)
Statistics	(3 crs)	Clinical Validation Exam	(19 crs)
Electives	(3-7 crs)	NUR 4102	(6 crs)
		NUR 4107	(5 crs)
		NUR 4110	(6 crs)
Humanities	(21 crs)	Social/Behavioral Sciences	(12 crs)
English/Literature	(3 crs)	General Psychology	(3 crs)
Philosophy-Health		Developmental Psychology	(3 crs)
Care Ethics	(3 crs)	Introductory Sociology	(3 crs)
Religious Studies	(6 crs)	Elective	(3 crs)
Humanities Elective	(9 crs)		
Free Electives	(6 crs)		

NOTE: BSN candidates take NUR 3110; MSN candidates may take NUR 8904 after completing a course in statistics

FACILITIES FOR INSTRUCTION AND PRACTICE

The University assumes full responsibility for providing the instruction throughout the entire program. (*Students are responsible for their own transportation to and from the various facilities utilized for the practice of nursing.*) Community based practice of nursing will most likely require individual means of transportation for agency and home visiting. During the professional portion of the curriculum, theory and laboratory are directed by faculty members. Among the agencies used for student experience are the following:

Albert Einstein Medical Center, Philadelphia, PA
Alleghany University Hospital-East Falls, Philadelphia, PA
Fox Chase Cancer Center, Philadelphia, PA
Belmont Center for Comprehensive Treatment, Philadelphia, PA
The Bryn Mawr Hospital, Bryn Mawr, PA
Children's Hospital of Philadelphia, Philadelphia, PA
Community Health Affiliates, Ardmore, PA
Crozer-Chester Medical Center, Chester, PA
Delaware County Memorial Hospital, Drexel Hill, PA
Graduate Hospital, Philadelphia, PA
Holy Redeemer Nazareth Visiting Nurse Agency, Philadelphia, PA
Hospital of the University of Pennsylvania, Philadelphia, PA
Lankenau Hospital, Philadelphia, PA
Learning Resource Center, College of Nursing
Little Flower Manor, Darby, PA

Villanova University

Main Line Rehabilitation and Nursing Center, Paoli, PA
Mercy Catholic Medical Center, Fitzgerald Mercy Division, Darby, PA
Mercy Catholic Medical Center, Misericordia Division, Philadelphia, PA
Montgomery Hospital, Norristown, PA
Pennsylvania Hospital, Philadelphia, PA
Presbyterian Hospital Home Health, Philadelphia, PA
Progressions Health Care System, Fort Washington, PA
St. Christopher's Hospital for Children, Philadelphia, PA
St. Joseph Villa, Flourtown, PA
Thomas Jefferson University Hospital, Philadelphia, PA
Veterans Administration Medical Center, Philadelphia, PA
Visiting Nurse Association, Philadelphia, PA

Selected school systems, day-care centers, community health centers, senior citizen centers, and industries are also used.

HEALTH AND WELLNESS MINOR

The Health and Wellness Minor encompasses an understanding of the concepts of healthy living and nutrition and the knowledge of the changing health care system. The knowledge obtained in this minor can be applied to studies in the areas of social sciences, business and psychology. Requirements for the minor include NUR 2200, NTR 2120 and NUR 7080. Students then choose one of the following courses to complete the requirement: NUR 4800, NUR 4802, NUR 7040, NUR 7081, NUR 7082, NTR 7120. The minor requirement is 12 credits and is open to all non-nursing majors. Students must have junior status to take the 7000 level courses.

COURSES AND PROGRAMS

NOTE: In the courses listed below, the semester listings indicate which semester the course is offered. If there is no semester listing, the course is offered on an occasional basis only.

NURSING

Professors: Fitzpatrick, Sharts-Hopko

Associate Professors: Beletz, Brown, Copel, Dolen, Haynor, Hollingsworth,
Manfredi, Mynaugh, Smeltzer, Weingarten

Assistant Professors: Bradley, Costello, Crumlish, DeSilets, Dowdell, Erickson,
Fetter, Frain, Keech, McGinn, McGovern, O'Driscoll, Ott, Patterson,
Pizzi, Ritchie, Schiller, Smith, Strack, Sullivan, Todd, Willens, Zamerowski, Zawacki

Clinical Assistant Professors: Capriotti, McKenna, Wimmer

Instructors: Bruderle

Adjunct Professor: Wildgust

NUR 1101 Introduction to Professional Nursing I
Development of nursing as an art, science, and

profession. Current and evolving roles of the nurse
in health care within a Judeo-Christian value system.

(2 cr) *Annually.*

NUR 1103 Introduction to Professional Nursing II

Use of effective communication and assessment process in professional nursing practice. (2 cr) *Sem 1&2.*

NUR 2104 Nursing Process and Health

Assessment Nursing assessment and diagnosis related to environmental variables and health behaviors of individuals and families. (2 cr) *Annually. Coreq: NUR 2105.*

NUR 2105 Nursing Process and Health

Assessment Lab Practice of selected assessment skills in a laboratory setting. (1 cr) *Two hours a week. Annually. Coreq: NUR 2104 .*

NUR 2106 Essentials of Nursing Practice

Identification of the health maintenance, restoration, and promotion needs of individuals from birth through senescence. Emphasis on the nursing process and the role of the nurse as an interdependent and collaborative member of the health care team.. (2 cr) *Sem 1&2. Prereq: NUR 1101, 1103, 2104 and 2105. Coreq: NUR 2107.*

NUR 2107 Practicum in Essentials of Nursing

Practice Practice of selected assessment and nursing skills in the laboratory and clinical settings. (2 cr) *Sem 1&2. Prereq: NUR 2104 and 2105. Coreq: NUR 2106.*

NUR 2200 Healthy Lifestyles and Human Values

Exploration of real life issues of college students, with emphasis on personal decision making and values clarification. Substance use/abuse, sexuality, depression, STD/AIDS, stress management. (3 cr) *Sem 1&2.*

NUR 3000 Foundations in Nursing and Health

Concepts of health and the systems of health care. The College of Nursing philosophy as a framework for formulation of nursing diagnosis and design of care. (3 cr) *Registered Nurse Students only. Annually. Coreq: NUR 3005.*

NUR 3005 Practicum in Nursing and Health

Nursing assessment of individuals and families in laboratory and clinical practice. (1 cr) *Two hours a*

week. Registered Nurse Students only. Annually. Coreq: NUR 3000.

NUR 3030 Basic Concepts in Pharmacology

A classification of pharmacological agents, their actions, dosages, toxicity and interactions related to the physiological variables and life-cycle. (3 cr) *Sem 1. Prereq: General Chemistry I and II, Anatomy and Physiology.*

NUR 3108 Pathophysiology

Human pathogenesis from cellular, histologic, and systemic perspectives. Emphasis on pathophysiology that is commonly experienced by the individual and frequently encountered in the clinical setting. The influence of etiologic agents, environment, and human behavior on health maintenance, health restoration, and health promotion. (3 cr) *Prereq: BIO 1205 and 1206.*

NUR 3110 Research in Nursing

Emphasis on the methods of systematic inquiry in nursing practice. Designed to develop critical consumers of published research. (3 cr) *Sem 1&2.*

NUR 3112 Nursing Care of Adults

Nursing interventions directed toward maintaining, restoring, and promoting health for adults and their families expressing age-related changes and other health alterations. (6 cr) *Sem 1&2. Prereq: NUR 2104, 2105, 2106 and 2107. Coreq: NUR 3113 and 3108.*

NUR 3113 Practicum in Nursing Care of Adults

Clinical application of nursing interventions directed towards maintaining, restoring, and promoting health of adults with health alterations in a variety of settings. (6 cr) *Sem 1&2. Prereq: NUR 2104, 2105, 2106 and 2107. Coreq: NUR 3112.*

NUR 3116 Nursing Care of Adults with Complex

Health Problems Maintenance, restoration and promotion of health for adults and groups expressing complex alterations of mental and physical health. (6 cr) *Sem 1&2. Prereq: NUR 3112 and 3113. Coreq: NUR 3117.*

NUR 3117 Practicum in Nursing Care of Adults

with Complex Health Problems Clinical application of nursing interventions directed toward mental

health, physical health and health promotion of adults with complex health alterations in a variety of settings. **(6 cr)** *Sem 1&2. Prereq: NUR 3112 and 3113. Coreq: NUR 3116.*

NUR 4101 Parent-Child Nursing Nursing interventions for maintaining, restoring, and promoting health for women, infants, children, and adolescents in childbearing and childrearing families. **(6 cr)** *Sem 1&2. Prereq: NUR 3116, NUR 3117. Coreq: NUR 4103.*

NUR 4102 Nursing and Health Promotion Nursing and educative interventions which promote the health of groups. Focus on health needs of populations and management of health risks. **(6 cr)** *Annually. Prereqs: NUR 4100 and NUR 4105. Coreq: NUR 4107.*

NUR 4103 Practicum in Parent-Child Nursing Clinical application of nursing interventions toward maintaining, restoring, and promoting health of women, infants, children, and adolescents. **(6 cr)** *Sem 1&2. Prereqs: NUR 3116 and 3117. Coreq: NUR 4101.*

NUR 4107 Practicum in Health Main-tenance, Restoration and Promotion in Community Settings Application of health promotion strategies to groups composed of individuals, family and community members. **(6 cr)** *Twelve hours a week. Annually. Prereq: NUR 4100 and NUR 4105. Coreq: NUR 4102.*

NUR 4110 Leadership and Management in Nursing Leadership and management principles related to the practice of nursing. **(5 cr)** *Three hours of lecture and four hours of laboratory a week. Sem 1&2.*

NUR 4130 Contemporary Issues and Trends in Nursing Critical analysis of major issues and trends in nursing and health care. **(2 cr)** *Annually.*

NUR 4800 Women's Health Issues Women's Health from physiological, psychosocial, political, historical and cultural perspectives. Open to non-nursing majors. **(3 cr)** *Annually.*

NUR 4802 Issues and Trends in Gerontology Aging and the effects of transitions associated with aging. Emphasis is on functional assessment, chronicity and the impact of demography. Open to nursing and other majors with interest in gerontology. **(3 cr)** *Annually.*

NUR 4900 Guided Study in Nursing Study or project development in a special interest area in nursing under faculty guidance. Includes tutorial sessions as necessary. Registration with the permission of the Dean. **(1-6 cr)** *Sem 1&2.*

NUR 6000 Seminars in Nursing and Health Series of seminars for practicing professionals on special topics in nursing and health. Professionals with permission only. **(1 cr)**.

NUR 7080 Introduction to the Health Care System This course is designed for non-nursing majors and will introduce the student to the complex health care industry utilizing a systems approach. The study will focus on its politics, policies and personnel in a variety of settings. **(3 cr)** *Sem 1.*

NUR 7081 International Health International and intercultural health care with focus on similarities and differences of culture, economics and related variables. Senior and graduate nursing majors, non-major upperclassmen by permission. **(3 cr)** *Annually.*

NUR 7082 Exploration in Loss Analysis of social, cultural and psychological conditions that influence grief in modern society. Undergraduates with permission. **(3 cr)** *Annually.*

NUTRITION

NTR 2120 Principles of Nutrition Principles of normal nutrition and the interrelatedness of economics, culture and health. Open to non-nursing students. **(3 cr)** *Sem 1&2.*

NTR 7120 Advanced Nutrition Application of clinical nutrition to the restoration and maintenance of health. **(3 cr)** *Annually. Prereq: NTR 2120 or equivalent.*

PART-TIME STUDIES

James R. Johnson, M.S., Director
Josephine Gibson, M.S., Assistant Director

HISTORY AND OBJECTIVES

For more than 75 years, the Division of Part-Time Studies has fulfilled the educational needs of thousands of men and women who were unable to or did not wish to pursue a regular full-time day program. Among those it serves are high school graduates who are unable to undertake a regular full-time day program but wish to undertake or complete an unfinished baccalaureate degree program; professionals who seek to update and expand their knowledge and skills; college graduates who lack undergraduate requirements for admission to graduate or professional school or who are seeking initial secondary school certification or additional endorsements for secondary school certification; high school graduates who do not qualify for acceptance as degree candidates but who seek the opportunity to prove themselves as non-matriculated students with the chance to matriculate upon the successful completion of a stipulated number of courses; and men and women of all ages who are simply interested in taking courses to enrich their personal lives. Senior citizens (age 65 and over) are eligible to enroll in undergraduate courses for personal enrichment only, but they are not charged for tuition. They may register AFTER the drop/add period, which is the first week of the semester, in courses in which the enrollment limit has not been reached.

Part-Time Studies provides comprehensive advising services at registration time and throughout the year to assist students in planning their educational careers and academic schedules. Each semester begins with an orientation for all new students to acquaint them with the general regulations and services of the College and the University. The University Counseling Center and the Career Services Office provide additional services to the Part-Time Studies student.

Although Part-Time Studies mainly serves the part-time student, it is possible, with special permission, for a student to take a full-time course load. Even on a part-time basis, however, a Part-Time Studies student can complete a baccalaureate program in five to six years. With permission of the Director or Academic Adviser, Part-Time Studies students may enroll in day classes.

Requirements for admission, advancement, and graduation are the same as those prevailing in the full-time undergraduate colleges. As a result, matriculated students may transfer from Part-Time Studies to one of the full-time colleges without loss of credit. Indeed, many high school graduates begin their degree programs in Part-Time Studies and subsequently transfer to the appropriate day college. Conversely, students who, usually for financial reasons, are obliged to discontinue as full-time students, are able to continue their studies as part-time students in Part-Time Studies.

The degrees pursued in Part-Time Studies are Villanova University degrees, in every respect commensurate with those offered by the full-time colleges of the University. The part-time engineering program is accredited by the Accreditation Board for Engineering and Technology, the business programs by the American Assembly of

Collegiate Schools of Business, and the computer science program by the Computer Science Accreditation Commission of the Computing Sciences Accreditation Board.

ADMISSION

Application forms for admission to part-time undergraduate study may be obtained from the Director, Part-Time Studies, Villanova University, 800 Lancaster Avenue, Villanova, Pennsylvania 19085.

Students seeking admission into degree programs (matriculated status) must submit complete records from all secondary schools and institutions of higher learning previously attended. Students seeking postgraduate status must submit transcripts showing degree and graduation date or a copy of the diploma from their baccalaureate degree institution. Students applying for non-matriculated (non-degree program) status must submit secondary school records indicating graduation or proof of receipt of a state equivalency diploma. *To avoid delay, address all material to Part-Time Studies.* Applicants for matriculated status are requested to have a set of complete records on file at least four weeks prior to registration in order to be evaluated in advance of enrollment. Registration as a non-matriculated student is suggested in those cases where transcripts are delayed.

Secondary school requirements for entrance to a specific curriculum are outlined in the University section of this *Catalog*. The requirement for non-matriculated status is proof of graduation from an accredited secondary school or proof of receipt of a General Educational Development Diploma.

Applicants for matriculation in a degree program will be evaluated on their previous academic records in high school and college, if applicable. Those who are not initially accepted as matriculated students (candidates in a degree program) may be accepted as non-matriculated students. Students will retain non-matriculated status until completion of at least 18 credit hours at Villanova at which time they will be re-evaluated for matriculation.

Students attending other institutions who are in good standing and have permission to take undergraduate courses at Villanova may do so as may high school seniors with strong academic backgrounds who have permission from their guidance counselor or principal. Senior citizens, those age 65 or older, may enroll in undergraduate courses for personal enrichment only without the payment of tuition. Information on the application procedures for these particular categories may be obtained from the Part-Time Studies office.

READMISSION

A student who has not attended classes in Part-Time Studies for two years or longer is considered an inactive student. To be readmitted, a PTS application form, from the PTS office in 107 Vasey Hall, must be completed. When the form is received, the record will be reviewed, and a letter sent to the applicant indicating readmission status.

DEGREES OFFERED

Villanova University offers the following programs of study for the bachelor's degree which may be completed through Part-Time Studies: Accountancy, Business Administration, Communication, Computer Science, Education (Secondary Education, Teacher Certification), English, Mechanical Engineering, General Arts, History, and Human Services. Note that the part-time engineering program is administered through the College of Engineering.

In addition to the Bachelor's degree, the following programs are available: Associate of Arts, Accountancy Certificate, Business Administration Certificate, Criminal Justice Certificate, Private Security Certificate, and Secondary Teacher Certification..

DEGREE REQUIREMENTS

Part-Time Studies

To qualify for the bachelor's degree, a student must complete successfully the requirements for the degree as described in this *Catalog*. Villanova University reserves the right to change program requirements without prior notice.

The Baccalaureate degree is awarded and a student is graduated when the curriculum prescribed by the University for one or more of the various degree programs has been satisfied. In addition to the curricular requirements, candidates for graduation must meet the following requirements:

- ? A minimum of 40 courses and 2 labs (varies according to major).
- ? A minimum of 122 credits (varies according to major).
- ? A minimum final cumulative quality point average of 2.0.
- ? A minimum of half of all courses required for the degree earned at Villanova.
- ? A minimum of half of the core requirements earned at Villanova.
- ? A minimum of half of the requirements for the major degree program earned at Villanova.
- ? The final 30 credits (senior year) must be earned at Villanova.

Detailed information on all the following degree programs may be found in the specific College and Department sections of this *Catalog*; additional specific information may be obtained from the Part-Time Studies office.

BACHELOR OF ARTS/BACHELOR OF SCIENCE

Students in the Bachelor of Arts program in Part-Time Studies may major in Communication, Education, English, History, Human Services, or General Arts. The degree requirements may be found under the departmental listings contained in this *Catalog*. Within the Bachelor of Arts degrees, minors are available in Business, Communication, Computer Science, Education, English, History, Human Services, Philosophy, Political Science and Sociology.

The Core Curriculum of the College of Liberal Arts and Sciences is applicable to these majors offered in Part-Time Studies: Bachelor of Arts in General Arts, Communication, English, History, and Human Services; and Bachelor of Science in Computer Science and Education. A description of the Core Curriculum may be found in the College of Liberal Arts and Sciences section of this *Catalog*.

For the Bachelor of Arts Degree in General Arts, General Arts with a Business Minor, Communication, English, History, and Human Services, 40 courses and a minimum of 122 credits are required.

For the Bachelor of Science in Computer Science, 41 courses and a minimum of 129 credits are required.

For the Bachelor of Science in Education, course and credit requirements vary according to the subject area of certification. The twelve subject areas available for certification are: Biology, Chemistry, Communication, English, French, General Science, German, Latin, Mathematics, Physics, Social Studies, and Spanish. Required courses in some subject areas, including student teaching, may be available during day times only. *Day classes are billed at the day tuition rates.*

ASSOCIATE OF ARTS

The Associate of Arts Degree program is designed for students who are not seeking a baccalaureate degree but still wish to follow a specific curriculum. The Associate of Arts Degree program may be completed in half the time it normally takes to complete the baccalaureate program. The program requires 20 courses and a minimum of 60 credits. At least half of the credits (30) must be taken at Villanova. A 2.0 cumulative QPA is required to attain the A.A. Students completing the program with a 2.0 average may continue toward the Bachelor of Arts without loss of credit.

<i>Subject</i>	<i>Credits</i>
ENG 1050, Advanced Literature ¹	6
Foreign Language 1121, 1122	6
HIS 1050, Advanced History ¹	6

Villanova University

MAT 1210, 1220, 1230, 1235; or CSC 1010, 1020, 1030	6
PHI 1050, Advanced Philosophy ¹	6
THL 1050, Advanced Theology ¹	6
ETH 2050	3
Humanities Elective ²	3
Social Science Electives ³	6
Free Electives	12

¹Advanced courses in these subjects must be numbered 2000 and above.

²Humanities Electives: Art History, Classical Studies, Communication, English, History, Modern Languages, Philosophy, Theology and Religious Studies, Theatre.

³Social Science Electives: Economics, Geography, Political Science, Psychology, Sociology.

BACHELOR OF SCIENCE IN ACCOUNTANCY

The B.S. in Accountancy requires a minimum of 42 courses and 124 credits. Details are to be found in the College of Commerce and Finance Section of this *Catalog*.

Part-Time Studies

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

The B.S. in Business Administration requires a minimum of 41 courses and 124 credits. The following courses are required.

FRESHMAN YEAR

<i>Courses</i>	<i>credits</i>	<i>Courses</i>	<i>credits</i>
ACC 1001	3	ENG 1010	3
ECO 1001, 1002	6	MAT 1330, 1335	6
PHI 1050	3	CHS 1000, 1001	6
BL 1090	3		

SOPHOMORE YEAR

ACC 1101, 1102	6	MGT 2006	3
Social Science ¹	3	STA 2107, 2108	6
CA 1100	3	HISTORY ²	3
ENG 1050	3	THL 1050	3
ETH 2050	3		

¹Social Science: choose from Geography, Sociology, Political Science, Psychology.

²History: choose from any course in the department.

JUNIOR YEAR

FIN 1113	3	Major Courses	6
MGT 1102	3	Natural Science ⁴	4
MGT 1141	3	Non-business Electives	6
MKT 1137	3		
ECO 2110 or Elective ³	3		

³ECO Elective: starting in Spring 1999, choose from ECO 2101, 2102, 3109.

⁴Natural Science: choose from AST, BIO, CHM or PHY with corresponding lab.

SENIOR YEAR

Humanities ⁵	3	THL Elective	3
Major courses	9	Social/Natural Science ⁶	3
MGT 3301	3	Free Electives	9

⁵Humanities: choose from Art History, Classical Studies, English, Modern Languages, Philosophy or Theatre.

⁶Social/Natural Science: choose from Geography, Political Science, Psychology, Sociology, or the Natural Sciences.

CERTIFICATE PROGRAMS

Several certificate programs are available through Part-Time Studies. Certificate programs are designed for individuals who already have bachelor's degrees but wish to develop expertise in a particular area. The following programs are available:

Accountancy Certificate

The Accountancy Certificate is designed to allow individuals who possess bachelor's degrees in liberal arts or other non-business majors to acquire expertise in accounting. Besides providing an educational opportunity

for persons interested in securing careers in accounting in a diversity of environments in industry, business and government, the program also meets the needs of individuals who work in smaller businesses or who are self-employed and need knowledge of accounting practices to make critical business decisions. The certificate requires 24 accounting credits which the state of Pennsylvania currently mandates as the minimum requirement to sit for the CPA examination.

To be eligible for this certificate, a student must possess a bachelor's degree from an institution accredited by the appropriate regional accrediting association. Eight courses must be completed: ACC 1101, 1102, 2310, and 2320 are mandatory. In addition, students must successfully complete four (4) of the following: ACC 2240, 2340, 2430, 2450, 2460, and 2470. Students are required to have any prerequisite courses necessary (indicated in the course description) for any particular course in the certificate program. A maximum of 2 courses (6 credits) will be allowed in transfer. No other course substitutions will be allowed.

Business Administration Certificate

The Business Administration Certificate provides business-related knowledge and skills and is especially useful to individuals with bachelor's degrees in liberal arts or other non-business majors who wish to acquire expertise in business areas. The program also meets the needs of individuals who work in smaller businesses or who are self-employed. *To be eligible for this certificate, a student must possess a bachelor's degree from an institution accredited by the appropriate regional accrediting association.*

Eight courses must be completed: 7 specifically required and 1 elective from the approved list of electives, which represent more advanced treatments of the required courses. Students are required to have any prerequisite courses necessary (indicated under the course description) for any particular course in the certificate program. A maximum of 2 courses (6 credits) will be allowed in transfer. No other course substitutions will be allowed.

The *required* courses are:

ACC 1101, 1102; ECO 1001, 1002; FIN 1113; MGT 1102; MKT 1137.

The *elective course* must be chosen from the following:

ACC 1001, 2240, 2310, 2320, 2340, 2430, 2450, 2460, 2470, 2480

BL 1090, 2135, 2150, 2170, 2185

ECO 2110, 3106

FIN 2323

MGT 1141, 2006, 2153, 2155

MKT 2220, 2225, 2277, 2280

STA 2107, 2108

Criminal Justice Certificate

Details on the Certificate in Criminal Justice are available in the College of Liberal Arts and Sciences and the Criminal Justice sections of this *Catalog*.

Private Security Certificate.

Details on the Certificate in Private Security are available in the College of Liberal Arts and Sciences and the Private Security sections of this *Catalog*.

SECONDARY TEACHER CERTIFICATION

Students who possess a bachelor's degree and want to pursue Teacher Certification on a part-time or full-time basis should apply through the Office of Part-Time Studies. The twelve subject areas which can be pursued at Villanova are: Biology, Chemistry, Communication, English, French, General Science, German, Latin, Mathematics, Physics, Social Studies, and Spanish. Details on Secondary Teacher Certification can be found in the College of Liberal Arts and Sciences section of this catalog.

CONTINUING STUDIES

The Office of Continuing Studies offers a great variety of non-credit educational opportunities. These offerings range from one day seminars to eight and twelve week programs. Many are offered on Villanova's campus; others are delivered off-campus, at convenient Delaware Valley corporate training sites. Some of the programs offered include: Alcohol and Drug Counseling; Paralegal Education; Marketing Communications; American Management Association Courses; Human Resource Management; Fund Raising; Payroll Administration; Commercial Real Estate; American Society of Training and Development Seminars; Project Management Training.

Many of these programs lead to or prepare one for professional certification. For information on any of these programs or for a complete listing of all offerings, contact the Office of Continuing Studies (519-4303), 102 Vasey Hall.

NON-MATRICULATED AND POSTGRADUATE STUDENTS

A student may enroll in Part-Time Studies without seeking a degree. Such students are classified as *non-matriculated students or postgraduate students*.

Postgraduate students are students who have already earned a bachelor's degree and are not seeking a second degree but merely taking undergraduate courses. These students are free to enroll in day or evening classes at Villanova through Part-Time Studies. Available space in day classes, however, may restrict their curricular options.

Non-matriculated students have not yet earned a bachelor's degree but seek to take college courses for a variety of reasons. Such students include those who:

- ? Want to take college courses to develop a particular expertise or for purposes of personal enrichment.
- ? Have applied for degree status but with current academic records have not been accepted. Such students may need to remedy deficiencies or establish their academic qualifications before applying or reapplying for degree programs. The conditions to be met before their records will be reevaluated are specified in the letter from the PTS Admissions Office.
- ? Have applied for degree status, but the credentials presented have been inadequate to enable the Admissions Committee to render a positive decision. These students are generally advised to pursue, as non-matriculated students, the program for which they requested admission, and to compile at least 18 credits, thus demonstrating their ability to complete the program requirements. After the students complete the 18 credits, they may request reevaluation.

Non-matriculated students or postgraduate students who wish to change to matriculated status must apply and complete the appropriate request form in the Part-Time Studies office. Students will be responsible to see that the PTS Admissions Committee has all necessary credentials for consideration of their requests (See the section on Admission, above).

Generally, non-matriculated students are urged to request degree status if possible rather than accumulate a large number of credits without any specific goals. Thirty credits should be taken as a guide in this regard.

Non-matriculated and postgraduate students must maintain good academic standing by carrying at least a 2.00 cumulative quality point average.

FLEXIBLE ENROLLMENT OPTIONS

FASTFORWARD AT VILLANOVA

To help adult students continue to move forward quickly toward graduation, we are instituting our FastForward at Villanova courses. These courses will be scheduled on seven Saturdays, either in the morning or afternoon, for a class period of 3 ½ hours, and will be supplemented with on-line instruction. FastForward 1 will

be held from late August till the middle of October, then FastForward 2 from mid-October to mid-December. Each course can be completed in only half a semester but is a complete three credit class with fewer on campus class hours. Additional FastForward classes are planned for Spring 1999.

VARIABLE COURSE LOAD

Students can vary the number of courses taken each semester, depending on their professional and personal demands. An average course load for many of part-time students is two per semester. By utilizing our FastForward courses, students may take a total of four courses in a semester: two during the regular semester, and one in each of the FastForward sessions. Students who take four courses in fall, four in spring, and two in the summer, will complete ten courses per year (the same amount as a full-time day student).

EVENINGS/WEEKENDS

Students can choose classes that meet one night a week for 14 weeks, on Saturdays for 14 weeks, on Saturdays for seven weeks with additional online instruction (FastForward), or on Friday nights and Saturdays (one credit psychology seminars).

SUMMER SESSION

Students who wish to quicken the pace of their degree program, can continue studies year-round by attending summer classes. Villanova offers an eight week summer evening session that runs from the end of May through the end of July.

DISTANCE EDUCATION

Because high technology is an integral part of the modern college classroom, Villanova University also offers classes via Internet and video during Summer Session as well as during the academic year.

ACADEMIC AND STUDENT POLICIES AND INFORMATION

With the exceptions and specifications listed below, students in Part-Time Studies are governed by the same regulations and policies that apply to students in the four undergraduate Villanova Colleges. See the general University section and the individual college sections of this *Catalog* for further information on all the following. *NOTE: it is the responsibility of the student to know and observe all academic policies and regulations. Such policies may change without prior notice.*

ACADEMIC STANDING

To qualify for a bachelor's degree, a candidate must earn a cumulative quality point average of at least 2.00. Part-Time Studies students who wish to take courses in the day sessions must also maintain a 2.00 cumulative quality point average. A student's record will be submitted to the Academic Standing Committee for appropriate action (ranging from probation to dismissal) if his average has fallen below 2.0. If a student is placed on probation his course load may be restricted, and he must achieve a specified grade point average in that semester in order to continue to be eligible for enrollment.

ADDRESS CHANGES

Important mailings are sent to students throughout the academic year. It is essential that all students keep the PTS office informed of any change in their permanent home address and/or mailing address. Otherwise, we cannot be responsible for students not receiving material through the mail. Change of Address forms are available in the PTS office, 107 Vasey Hall.

ADVANCED ACADEMIC CREDIT

In addition to the provisions for advanced academic credit listed in each College’s section of this *Catalog*, Part-Time Studies students may gain credit by examination by means of the College Level Examination Program (CLEP) administered through the College Entrance Examination Board. Credit is awarded for the CLEP Subject Examinations and NOT for the General Examinations. The credit must be applicable to the student’s program.

CLEP credits are considered transfer credits. A maximum of 60 transfer credits, which could include CLEP credits and credits from other colleges or universities, may be accepted toward a degree program.

A score equivalent to the 65th percentile or higher on an approved Subject Examination will be considered for credit. For further information, students should contact the Part-Time Studies office.

ADVISING

The Director and Assistant Director of Part-Time Studies are responsible for academic advising. They are available during evening or daytime hours. Appointments in the office or via telephone may be arranged through the Part-Time Studies office (519-4300).

- Accountancy Mr. James Johnson/Ms. Josie Gibson
- Accountancy Certificate Ms. Josie Gibson
- Business Administration Mr. James Johnson/Ms. Josie Gibson
- Business Administration Certificate Ms. Josie Gibson
- Communication Dr. Joan Lynch
- Computer Science Dr. Daniel Hardt
- Criminal Justice Dr. James McKenna
- Education, Teacher Certification Dr. Henry Nichols
- English, General Arts, History Mr. James Johnson/Ms. Josie Gibson
- Human Services Dr. Ken Davis
- Non-Matriculated and Assoc. of Arts . . . Mr. James Johnson/Ms. Josie Gibson
- Postgraduates Mr. James Johnson/Ms. Josie Gibson

Each student is assigned an Academic Adviser who may be contacted for assistance in making those decisions that affect academic goals. The student should consult with an Adviser at least once a semester to insure proper course selection and advancement in his program. *Note: Although Advisers will do all they can to assist students, the students themselves are responsible for securing accurate and timely information about policies and procedures affecting their academic programs, for understanding the requirements of degree programs they choose, for planning for the orderly fulfillment of those requirements, and for keeping accurate records of their academic progress and transactions.* Additional information and policies may be found in the University section and in the individual college sections of this *Catalog*.

AUDITING

Students who are not working for college credits may enroll for audit status with the consent of the Director of Part-Time Studies and the student’s Academic Adviser. Additional information may be found in other sections of this catalog.

CHANGE OF DEGREE PROGRAM

A student who wishes to change degree programs must request the change on a form available in the Part-Time Studies office.

CLASS STATUS

Matriculated students (those who have been accepted into a bachelor’s degree program) with under 30 credits *completed* are considered Freshmen; with 30-59 credits, Sophomores; with 60-89 credits, Juniors; and with 90 credits or more, Seniors.

DEAN'S LIST

To be included on the Dean's List, a student must be matriculated in a degree program, must achieve a 3.5 GPA, and must carry at least 6 credits per semester, none of which can be a pass/fail course. Letters of congratulations are mailed to each student who achieves this high honor. If a student so desires a letter can also be sent to his or her employer. The Dean's List pertains to the fall and spring semesters.

DROP AND ADD

Students may make changes in their schedules during the "Drop and Add" period -- the first five class days of each semester. To eliminate a course, add a course, or both, a student must obtain a "drop and add form" in the PTS office, complete the information, and secure the Academic Adviser's signature. To change only evening courses, the student may leave the form in the PTS office. To change day courses, students must take the completed and signed form to the appropriate location on campus where Drop and Add is being held. The Registrar's Office then will send a revised copy of the schedule. If the information is not accurate, the student should contact the PTS office for assistance. *NOTE:* In order not to be charged for a class, it must be dropped officially from the schedule *before* the start date of classes listed in the Academic Calendar.

FINANCIAL PLANNING

Villanova offers several easy-payment options to our students as well as payment by Discover, Visa or MasterCard. Students may also elect to use the deferred payment plan, for a small fee, whereby they pay one-third of the total tuition at registration and the other two-thirds at two different times after the start of the semester.

Another valuable resource for students can be their employers, many of whom will pay tuition for their employees who attend Villanova. Students who are employed either full or part-time should check their company's policy and take advantage of that benefit if it is available to them.

A list of scholarships, local and national, for adult part-time students is available in the PTS office.

GRADUATION APPLICATION

A student who expects to receive a degree is required to make official application for the degree no later than November 1 for May completion, April 1 for September completion, and August 1 for December completion. A "prospective graduate card" can be obtained from the Part-Time Studies Office. *This is an extremely important procedure.* The student's Adviser will review his or her record and verify the completion of all graduation requirements.

PARKING

Parking permits may be purchased at walk-in registration or at the Department of Public Safety (St. Clare House, 824 Lancaster Avenue). Further information is available from the University Parking Office (519-6990).

PERSONAL SAFETY

Students are requested to report all *Crimes* and *Emergencies* immediately to the Department of Public Safety (519-4444). Individuals who desire an escort or other assistance should call 519-6979.

REGISTRATION

All new students who have been accepted by Part-Time Studies and currently enrolled students in good standing are eligible for registration. It is the student's responsibility to see that he or she select courses in accordance with the requirements of his or her program and in consultation with his or her Academic Adviser.

Students are encouraged to register early, whether in person, by mail, or by *Fax*. Further information may be obtained from the fall or spring brochures or contact the Part-Time Studies office.

STUDENT PROGRAMS

During the course of both the fall and spring semesters, Part-Time Studies offers programs to help students become acquainted with the resources on campus and to aid in the transition to academic life. In the past the

Part-Time Studies

following programs have been scheduled: Orientation, Campus Tour, College Survival Skills (study skills workshop), Library Tour, and Career Services workshop. New programs can be added as the need arises. Suggestions are always welcome. Information on various programs is available from the PTS office.

STUDENT ACTIVITIES

Villanova offers approximately 150 different student organizations which fall under the jurisdiction of the Office of Student Development, located in 214 Dougherty Hall, 610-519-4210. For information on the various groups, visit or contact that office. PTS students are allowed to participate in any activity on campus except a varsity level sport.

The *Nite Line*, the newspaper published for PTS students, serves as a vehicle for disseminating news of interest to the Part-Time Studies student body.

TRANSFER OF CREDITS

Transfer provisions are described under “Admissions” in the University section of this *Catalog*. Applications for transfer into Part-Time Studies should be made in the Part-Time Studies Office.

PTS students who wish to take courses at other institutions should seek the approval of the Director or Assistant Director of PTS as to the particular institution they wish to attend and as to the particular course(s) they wish to take.

UNIVERSITY SENATE

The University Senate, an advisory group to the University President and the Board of Trustees, includes representation from Part-Time Studies. Junior class standing is a requirement for eligibility to serve as the Part-Time Studies representative. Students who may be interested in serving in the Senate should contact the Director, Part-Time Studies Office.

WITHDRAWAL FROM A COURSE

After the drop/add period, which is the first week of classes, any student who is unable to complete a course and wishes to terminate attendance in that course must do so through the official withdrawal procedure. *Discontinuance of attendance or notice to the instructor does not constitute official withdrawal.*

Students are required to notify the Part-Time Studies office promptly, either in writing or by completing the appropriate form in the Part-Time Studies office. A phone call to the PTS office is not acceptable. If the student withdraws in person, the date on the form will be considered the official withdrawal date. If the student withdraws via letter, the postmark date on the letter will be considered the official withdrawal date.

After the last date for Authorized Withdrawal (the Friday after mid-term break), a student may petition for withdrawal without penalty only for valid reasons. To do so, a student must submit a signed Request for Authorized Withdrawal, signed by the professor and/or laboratory instructor, along with the standard form for the Dean’s review.

If a student is granted the Authorized Withdrawal, the course remains on his transcript but the designation “WX” will appear in the grade column. “WX” signifies that the withdrawal was approved, and there is no grade given or calculated for that course. A student who leaves class without officially withdrawing will continue to incur absences and will receive the final grade of “Y” (unauthorized withdrawal) which is calculated as an F in the grade point average.

Villanova University

HASHEM ASHRAFIUON, 1988; B.S., 1982, M.S., 1984,
Ph.D., 1988, State University of New York at Buffalo.

GLEN ALEXANDRIN, 1970; B.A., 1958, University of
Alberta; Ph.D., 1967, Clark University. *Assistant
Professor, Economics*

CAROL AMBRUSTER, 1987; B.S., 1971, Northeastern
University; Ph.D., 1984, University of Pennsylvania.
Assistant Professor, Astronomy and Astrophysics

MOENESS G. AMIN, 1984; B.S.E.E., 1976, Cairo
University, Egypt; M.S.E.E., 1980, University of
Petroleum and Minerals, Saudi Arabia; Ph.D., 1984,
University of Colorado. *Professor, Electrical and
Computer Engineering*

JAMES W. ARRISON, 1992; B.S., 1983, Villanova
University; Ph.D., 1990, University of Pennsylvania.
Assistant Professor, Physics

DEBRA A. ARVANITES, 1983; B.S., State University of
New York, 1977; M.B.A., 1979; Ph.D., 1982,
Rensselaer Polytechnic Institute. *Assistant Professor,
Management*

THOMAS ARVANITES, 1989; B.A., 1977, M.A., 1979,
Ph.D., 1986, State University of New York at Albany.
Associate Professor, Sociology

CHERYL ASHER, 1984; B.A., 1977, Boston College; Ph.D.,
1981, University of Pennsylvania. *Assistant Professor,
Economics*

CHARLES E. ASHLEY, 1988; B.S., 1981, University of
Toledo; M.S., 1983, Rensselaer Polytechnic Institute;
Ph.D., 1986, Rensselaer Polytechnic Institute. *Assistant
Professor, Mathematical Sciences*

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