SUMMER STATISTICS WORKSHOPS

Presented by
Center for Statistics Education
Villanova University

SUMMER 2017 WORKSHOPS

July 18-21   **Beyond AP Statistics (BAPS)**
for experienced AP/intro Stat teachers

July 24-28   **AP Statistics Workshop**
for AP Stat teachers who are new or want new teaching strategies or methods

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Are you a teacher in high school or college who is interested in statistics education? Have you been thrown into teaching statistics but don't know where to begin? Join regional and national statistics education experts for our workshops.

Beyond AP Statistics
July 18-21, 2017

This workshop is designed for experienced introductory statistics instructors. It covers material just beyond the introductory/AP Statistics curricula. It is useful for instructors who assign projects to their students that employ more advanced methods, for those with a curiosity about learning more statistics, or for those interested in pursuing independent statistical consulting.

This workshop takes place over three-and-a-half days, consisting of two full-day and three half-day sessions, each presenting a different topic. The workshop takes place from 9-5pm Tuesday-Thursday and 9-1pm on Friday. Lunch will be held Noon-1pm each day. Based on feedback from past workshops, we have added an optional practice session from 4-5pm where participants can continue working to complete exercises and extend their knowledge and expertise beyond the material covered during that day's sessions.

The following topics will be covered this year:
- *Introduction to R (Tue)*, with Michael Posner. R, an open-source program, is fast becoming the statistical software of choice for both statisticians and data scientists. We will introduce data collection, cleaning, and manipulation. R will be used in subsequent workshop sessions. This is a full-day session.
- *Multiple Regression (Wed)*, with Michael Posner. Multiple regression is modelling that includes more than one independent variable, like most real-world situations. We have extended this to be a full-day session.
- *ANOVA (Thu morn)*, with Paul Bernhardt. Analysis of Variance (ANOVA) allows comparison of means for more than two groups. It also introduces the decomposition of variances that is used in other analytic techniques.
- *Bayesian Statistics* (*Thu aft*) with Jesse Frey. Bayesian statistics changes the framework of inference to infer about population parameters given the data, rather than the less intuitive reverse that is used by frequentist/traditional statistical inference.
- *Meta-analysis* (Fri morn) with Tom Short. Meta-analysis involves combining results from multiple summaries.

Please register at www.tinyurl.com/CSEWorkshop
Early Registration: Before June 30, 2017: $435
Late Registration: After June 30, 2017: $495

Comments from Previous Workshops
"I enjoyed the balance between presenting the material and having a chance to work with [data]"
"[I appreciated] the ability to ask questions that have bothered me for years without knowing who to ask the answers"
"I feel better prepared to answer questions from my more curious students."
"The topics were timely and engaging. I appreciate the opportunity to hear from experts in the field. And I also appreciate the opportunity to hear what other Statistics teachers are doing, wondering, struggling with."
"Thank you for all of your help and guidance…It has made a tremendous impact on my teaching and I'm forever grateful!"

About the Instructors

Dr. Michael Posner is an Associate Professor of Statistics at Villanova University, where he has been since 2005 after completing his Ph.D. in biostatistics at Boston University. His publications and research span the fields of statistics education research, biostatistics, public health, health care research, statistics and the law, educational research, and analysis of observational studies. His research has been funded by the National Science Foundation, the Agency for Healthcare Research and Quality, and the Villanova Center for Nursing Research. Dr. Posner serves on a number of regional and national committees on statistics education, including the Executive Committee of the Section on Statistics Education for the ASA and was Chair of the Special Interest Group of the MAA for Statistics Education. Dr. Posner won the 2010 Villanova University Faculty Award for Innovative Teaching, MAA's 2012 Alder Award for Distinguished Teaching, and ASA's 2012 Waller Education Award. He is the founding director of the Center for Statistics Education, a Center for Excellence in the College of Liberal Arts and Sciences at Villanova University.

Dr. Paul Bernhardt is an Assistant Professor of Statistics at Villanova University, where he has been since 2013 after completing his Ph.D. in statistics at North Carolina State University. His research interests lie in the area of missing and censored data. Specifically, he has dealt with handling censored predictors in a variety of regression models, with a particular focus on joint modeling of a univariate response and longitudinal predictor. While Dr. Bernhardt views research as central to his position at Villanova, he has always considered teaching to be his true passion. As an undergraduate, he obtained a Pennsylvania teaching certification in mathematics, and in graduate school he won multiple teaching awards as a teaching assistant.

Dr. Jesse Frey is a Professor of Statistics at Villanova University. He has been at Villanova since 2005, when he completed his Ph.D. in Statistics at the Ohio State University. His research interests include nonparametric statistics, ranked-set sampling, Bayesian statistics, statistical computing, and statistics in sports. In 2015, he received the Veritas Research Award from Villanova's College of Liberal Arts and Sciences. Dr. Frey is the director of Villanova's Master's program in Applied Statistics, and he serves as an associate editor for the journal *The American Statistician*.

Dr. Tom Short is an Associate Professor in the Statistics Program within the Department of Mathematics at West Chester University of Pennsylvania. He previously held faculty positions at Villanova University, Indiana University of Pennsylvania, and John Carroll University. He is a Fellow of the American Statistical Association, and received the 2005 Mu Sigma Rho Statistics Education Award. Tom has served on the leadership team for readings of the AP Statistics Exam, and on the AP Statistics Development Committee. He has also served on the Board of Directors of the American Statistical Association. Tom treasures the time he shares with his four children, and the many adventures experienced with his wife, Darlene.

AP Statistics Workshop
July 24 – 28, 2017

This workshop is designed for teachers of AP Statistics, those new to the course, or experienced, but desiring new strategies and methods to improve their teaching.

You will learn to:
- Understand and manage the scope of the AP course
- Become familiar with the AP exam
- Become familiar with the reading process
- Use the TI-84, Fathom, and Minitab in the presentation of course materials

There are four foundational themes for AP Statistics: design of experiments, exploratory data analysis, probability, and inference. We will explore these strands of content in relationship to the technologies and pedagogical strategies we can employ to have our students succeed on the AP Statistics examination. The role of the College Board and ETS in the administration of the AP program will be presented, and there will be an overview of the AP syllabus content with emphasis on topics of concern to participants. A complete review of the scoring of the current AP examination will be given. The focus is on bringing the best teaching techniques and strategies to the classroom. You are encouraged to bring a laptop.

Tentative Schedule of Activities
Monday	AM-1	Introduction and overview of course and materials
	AM-2	Beginning the year, simulations, the logic of inference
	PM	Exploratory data analysis, how EDA is tested, Design of Experiments
Tuesday	AM	Detailed review of assigned exam questions and exam grading
	PM-1	More simulation practice and the investigative task
	PM-2	Review of Exploratory Data Analysis assignment and typical questions
Wednesday	AM-1	Review of Design of Experiments assignments
	AM-2	Introduction to probability and how it is tested
	PM-1	Introduction to inference
	PM-2	Materials to review and reinforce inference
Thursday	AM-1	Review of assigned probability and inference materials
	AM-2	Activities to reinforce inference
	PM	The Investigative Task Question and Useful web resources
Friday	AM-1	Review of assigned inference materials
	AM-2	Preparation for Multiple Choice exam questions
	PM-1	A closer look at how inference has been tested
	PM-2	Summation and evaluation

Please register at www.tinyurl.com/CSEWorkshop
Early Registration: Before June 30, 2017: $695
Late Registration: After June 30, 2017: $795

Comments from Previous Workshop
"I have been fortunate to attend many AP 1 day workshops and other professional sessions during my career. Rarely have I had the pleasure of the professionalism, knowledge and prior preparation that [Rev Dr. Joseph Oechsle] exhibited. Joe is a master teacher, and his passion for teaching and the subject was evident. I shall gladly recommend Joe to any colleague searching for excellent instruction."

About the Instructor

Rev. Dr. **Joseph Oechsle** has taught at the Malvern Preparatory School for 37 years - AP Calculus AB and BC, AP Statistics, AP Latin, AP German, Comparative Religions, Logic, Introduction to Philosophy, and all levels of mathematics. He also serves as an adjunct in mathematics at St. Joseph's University, Villanova University, and Montgomery County Community College. He is a faculty consultant to the College Board in AB Calculus AB and BC and in AP Statistics and presents annually in the Kentucky Science and Technology Corporation program for rural public schools, and Project Reach in New York. He has read the AP Calculus and AP Statistics examinations and now is an AP Table Leader in Statistics. He has been an active member of the Norriton Fire Company for 40 years.

About The Workshops

The workshops will be held at <u>Villanova University</u>, which is easy to get to via private or public transportation. Parking permits for the Main Lot will be provided for attendees. See below for more information about getting to Villanova and hotels. The specific room location will be shared after registration is complete.

<u>Lunch</u> each day is included in the cost of the workshop. Vegetarian options are available. If you have any specific dietary restrictions, please let us know.

A <u>certificate of completion</u> will be provided to participants at the end of the workshop.

A <u>website</u> for each workshop will be available to access workshop information, both during the workshop and afterwards.

Please bring a <u>laptop</u> with you, if you have one.

These workshops are provided through the Center for Statistics Education. The Center for Statistics Education is a Center of Excellence in the College of Liberal Arts and Sciences at Villanova University. The overall goals of the Center for Statistics Education include promoting quality research among faculty, and working to improve statistics education in the curricula across disciplines at Villanova by creating programs in statistics education for current Villanova students. The Center also provides professional development for statistics teachers in the greater Philadelphia region at the K-16 levels and conducts research on effective methods in statistics instruction and pedagogy.

If you have any questions about the workshops or the Center, please contact us at cse@villanova.edu or call the Director, Michael Posner, at 610-519-3016.

Campus map

For a detailed campus map, please go to:
https://www1.villanova.edu/content/dam/villanova/conferenceservices/documents/Map+Directions-VillanovaConferenceServices9-12.pdf

Getting to Villanova University

By Car To Main Parking Lot from US Rt 30/Lancaster Avenue
From New York and New England: Take the New Jersey Turnpike to Exit 6 (Pennsylvania Turnpike exit). Follow the Pennsylvania Turnpike to Exit 20 (Mid-County Interchange). Take the second exit ramp (I-476 South/Chester). Take I-476 South to Exit 13 (US 30 - St. Davids/Villanova). Proceed east on Route 30 (Lancaster Avenue) for 3/4 mile and at the sixth traffic light turn right onto Ithan Avenue and into the main parking lot.
From the West: Take the Pennsylvania Turnpike to Exit 326 (Valley Forge). Take I-76 (Schuylkill Expressway) to Exit 331A (I-476 South/Chester). Take I-476 South to Exit 13 (US 30 - St. Davids/Villanova). Go right/east on Route 30 (Lancaster Avenue) for 3/4 mile and at the sixth traffic light turn right onto Ithan Avenue and into the main parking lot.
From the South: Take I-95 North to Exit 7 (I-476 North-Plymouth Meeting). Take I-476 North to Exit 13 (US 30 - St. Davids/Villanova). Go right/east on Route 30 (Lancaster Avenue) for 3/4 mile and at the fifth traffic light turn right onto Ithan Avenue and into the main parking lot.

By Train
Take AMTRAK or New Jersey Transit (via SEPTA) to the 30th Street Station in Philadelphia. Ask the attendant to direct you to the Regional Rail Trains (SEPTA). Take the Paoli/Thorndale Local train to the Villanova Station, located on our campus. Wheelchair access: All Airport and Center City stations are wheelchair accessible, however, Villanova Station is not. Continue on the train past Villanova to the wheelchair accessible Wayne Station and from there take a taxi (prearranged) to the Villanova campus.

By Plane
Arrange to fly into Philadelphia International Airport, which is located 30 minutes by car from the Villanova campus.

This information on getting to Villanova can be found online at:
http://www1.villanova.edu/villanova/admission/visit/maps.html
More information about getting to and from campus can be found at:
http://www1.villanova.edu/villanova/studentlife/parents/visit/travel.html

Hotels Near Villanova

For a list of nearby hotels, please go to:
http://www1.villanova.edu/villanova/studentlife/parents/visit/hotels.html