

IGNITE CHANGE. GO GREEN.

Faculty Spotlight:

Ross Lee, PhD, Adjunct Professor in the College of Engineering

In this interview series we bring you inside the world of Villanova's faculty and explore how their work relates to creating a sustainable future. In this issue we hear from Dr. Ross Lee, an adjunct professor in the College of Engineering.

What is your academic background?

I studied chemistry at the University of Rochester before completing my doctorate in Organic Chemistry at Michigan State. The focus of my thesis was on a fundamental new Organic Chemistry reaction that enabled new ways to synthesize complex organic molecules with less waste and energy, while producing higher yields.

How long have you been teaching at Villanova?

I have been teaching at Villanova for seven years.

In your own words, how would you define sustainability and why is it important to you?

I would define sustainability as "enough for all forever." Learning from nature to change the way we engage with the earth so that we become a sustainable member of the ecosystem and return more than we take so that future generations will be advantaged instead of compromised. Sustainability is the sensible way to holistically solve the problems that face us. Embracing sustainability will lead to not only better solutions, but also more prosperous and longer lived outcomes.



What is your current research focus?

I study sustainable materials, especially biomimetic solutions (inspired by nature).

Do you collaborate with others for your research?

All the time. Our Sustainable Engineering Master's and PhD program is based on collaborating with other faculty in order to bring in the discipline specific expertise to complement the sustainable engineering, whole systems perspective.

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Do you incorporate sustainability into the courses you teach?

Yes. I start with the benefits that today's technologies provide in the course area and discuss the associated sustainability concerns. We then look at sustainable alternatives and focus on how we can achieve the benefits while reducing these issues. I use this approach in my Sustainable Materials course, my Biomimicry course and my Sustainable Industrial Chemistry course.



If you could create one course out of thin air, what would it be?

I would like to develop a course on Industrial Symbiosis (sometimes referred to as Industrial Ecology). Such a course would focus on how the waste products of one industrial process can become the incoming raw material for another to provide a closed loop system and one aligned with the emerging "circular economy". The premier example of this is in Kalendborg, Denmark where 7 companies have been utilizing industrial symbiosis for over 40 years. I had the pleasure of visiting Kalendborg with one of my Master's students, a Fulbright scholar from Peru, in August of 2014. It was an exceedingly worthwhile experience and I discussed collaborating with Kalundborg to develop such a course based on their model and the training that the Kalundborg Industrial Symbiosis Institute provides today.

What are your favorite outside of the office activities?

I enjoy being outdoors either hiking, biking, kayaking or boating.