Teaching Sustainability in a Study Abroad Context

**As a structural engineering professor I wanted to incorporate more about sustainability in my courses. Because of limited class time, I was unable to add this component to traditional courses. When the opportunity arose to lead a study abroad course, I jumped at the opportunity to teach a course on sustainable buildings. This university program required that it be open to any student at the university, so it needed to appeal across disciplines. By working with faculty at Queen’s University in Belfast the students were able to hear a European perspective on sustainability. Through seminars the students learned how the Kyoto treaty influences policy about sustainability of buildings and how the U.K. is implementing and measuring energy usage in buildings.**

**Northern Ireland is small so it was easy to travel to several different academic laboratories to see energy research. In order for Northern Ireland to meet the requirements of the Kyoto treaty they need to retrofit their existing housing stock. One laboratory built a full scale duplex. Two families are living in it while their energy usage is being monitored. After one year, one unit will be retrofitted from the outside and one from the inside. The homes will then be monitored for another year. From an engineering standpoint, the students were able to see that energy use needs to be measured before a full scale policy of retrofit is adopted. From a psychological standpoint, the students were able to see that one method will be much more disruptive to families than the other and this may have an impact on how easy it is to get people to retrofit.**

**Another laboratory we visited trained technicians on how to install energy saving devices in their homes. Engineers can design brilliant energy efficient equipment, but if no one knows how to install it properly, then it will be of no use. The business and construction side of improving building energy efficiency was shown to the students.**

**We visited a laboratory that developed and installed the first tidal generator to provide electricity to the grid. Students learned about the many regulatory actions that had to be met before this generator could be installed. The laboratory had a large wave pool for research on wave power generators. Algae biomass and algae biofuels are also being studied in this lab, so biology was also brought in to the interdisciplinary research.**

**Students learn an enormous amount by visiting laboratories and hearing seminars from the U.K. perspective. In order to reinforce the interdisciplinary nature of sustainability, however, students must have time for discussion moderated by the professor. Design of questions is critical.**

**The biggest challenges I face with the interdisciplinary class is getting non-engineers and engineers to take the same class. Non-engineers think that it will be all quantitative. Engineers think it will be too touchy-feely. I found that the non-engineers actually enjoyed learning some quantitative skills. The engineers were less likely to want to learn about policy or behavior. They tended to think that people would always choose the most energy efficient choice regardless of other circumstances.**