Statement of Teaching Interests – Joule Bergerson

My teaching interests reflect my research interests of developing tools and methods that can be applied to interdisciplinary environmental engineering and policy problems. The following is a brief summary of my previous teaching experience.

University of Calgary
2007: Instructor, Life Cycle Assessment: Tools, Methods and Applications

Carnegie Mellon University
2004: Teaching Assistant, Introduction to Civil and Environmental Engineering
– Structural engineering project
2003: Project Manager, Human Capital: Attraction and Retention in Pittsburgh
2001- 2002: Teaching Assistant, Introduction to Civil and Environmental Engineering
– Project management/construction project

University of Western Ontario
1995-1996: Professor’s Assistant, Chemistry 020
– First year course required by engineers and science majors

I am currently developing and teaching a graduate course entitled “Life Cycle Assessment: Tools, Methods and Applications”. In addition to providing background on this course, the following section outlines 3 examples of courses in the field of energy and environmental systems analysis that I would be interested in developing and teaching.

Life Cycle Assessment: Tools, Methods and Applications

This course deals with the concept of life cycle assessment as it applies to the fields of engineering, design and business. Students in this course will be introduced to the structure of life cycle assessment including goal and scope definition, inventory analysis, impact assessment, and interpretation. Several tools and frameworks (e.g. process, input-output, hybrid life cycle assessment), will be reviewed and evaluated. Finally, the relative merits of various methods for interpreting and valuing the impacts will be considered. These concepts are demonstrated and applied through a class project where individuals can apply the methods and tools learned in the class towards a research project within the area of study for each student. The course will prepare students to apply life cycle assessment concepts and methods to analysis and design of products and processes. The textbook for this class is “The Hitch Hiker’s Guide to LCA” by Baumann and Tillman. This text will be supplemented with current comparative LCA studies and background information. This course is targeted to graduate and advanced undergraduate students.

Tools and Methods for Sustainability Engineering and Environmental Management

In order to improve the sustainability of current engineering practices, a suite of tools and methods must be employed to evaluate the consequences and tradeoffs associated with these practices. Students in this course will become familiar with tools for evaluating sustainability including a suite of metrics and indices. Design and management of more sustainable systems can also be aided by the principles of design for the environment, pollution prevention, substitution of materials, environmental management systems, risk management, cost-benefit analysis, environmental impact assessments and life cycle assessment. A possible textbook for this course is “Industrial Ecology” by Graedel and Allenby. This text will be supplemented with sections/chapters from other books and research papers.
Probability and Statistics for Environmental Decision Making

Traditional concepts of probability and statistics will be introduced including probability, random variables, probability distribution functions, random processes, discrete and continuous distributions, numerical measures and hypothesis testing. These concepts will be applied to the analysis of complex systems under conditions of variability and uncertainty. Examples and applications will be used to show how these tools are used for policy analysis and decision making.