

Course Information: EE 6693 Advanced Topics in Environmental Design Engineering

What is Environmental Design Engineering?

Environmental design engineering includes the creation and development of:

- innovative tools, approaches, methodologies and standards to improve the environmental aspects of product and process designs, including life cycle optimized products, recycling and reuse;
- state-of-the-art environmentally friendly and efficient designs of products, processes and process technologies; and
- creative approaches for using energy, water and natural resources more efficiently, for reducing waste and for preventing pollution.

What are the objectives of this course?

To provide students with broad exposure of topics in environmental design engineering through industrial guest lectures, case studies and practical projects. This new course is intended for graduate students in Faculty of Engineering who pursue an M.Eng. degree with concentration in environmental studies, and for professional engineers and graduate students who are interested in this field.

What is the number of credit hours of this course?

3ch

How will this course be delivered?

The course will be delivered by experts from industry and universities in the 3-hour modules from 1:30pm-4:3pm, mostly on Thur. in H301. The course will be coordinated by Dr. Liuchen Chang (Tel.: 447-3145, e-mail: Lchang@unb.ca, Office: GD111).

What are the contents of this course?

The course includes the following topics, many of which will be covered by the lecturers:

- **Natural resources in engineering context:** including water, soil, energy, mine, forestry and vegetation.
- **Pollution and pollution control:** sources, impacts and controls for water pollution, air pollution, soil pollution, solid waste and chemicals, noise and electromagnetic pollution.
- **Renewable energy conversion:** principles and applications of energy conversion using renewable sources and their environmental, economical and social benefits. Renewable energy sources including wind energy, solar energy, biomass, geothermal energy, wave energy. Introduction to combined cycle generation, energy efficiency initiatives.
- **Product life cycle assessment:** product system, life cycle, principles of life cycle assessment, environmental labeling, cleaner production and green products.
- **Sustainable development:** principles and objectives of sustainable development

- **Environmental management and ISO14000:** principles of environmental management, environmental quality management, environmental monitoring technologies, introduction to environmental management system ISO14000.

How will the marks be calculated?

Assignments (assays)	40%
Project and Report	50%
Project Presentation	10%

Grade	Percentage	Grade	Percentage
A+	90-100	A	85-90
A-	80-85	B+	75-80
B	70-75	B-	65-70
C+	60-65	C	55-60
D	50-55	F	0-50

Some References for EE6693 Advanced Topics in Environmental Design Engineering (No need to purchase these references, we will send lecture notes and reference materials on line)

1. Richard T. Wright, Bernard J. Nebel, Environmental Science: Toward A Sustainable Future, 8/E Publisher: Prentice Hall, 2002, SBN: 0-13-032538-4.
2. Ljubisa R. Radovic, ENERGY & FUELS IN SOCIETY, Second Edition, MaGraw Hill, January 1997, ISBN: 0-07-052577-3.
3. David L. Goetsch, Stanley B. Davis ISO 14000: Environmental Management, Publisher: Prentice Hall, 2001, ISBN: 0-13-081236-6.
4. H. Lee Willis and Walter G. Scott, Distributed Power Generation: Planning and Evaluation, published by Marcel Dekker, January 2000 ISBN: 0824703367.
5. Gilbert M. Masters, Introduction to Environmental Engineering and Science, 2nd Edition, Prentice Hall, 1996, ISBN: 0-13-155384-4.
6. J. Glynn Henry and Gary W. Heinke, Environmental Science and Engineering, 2nd Edition, Prentice Hall, 1996, ISBN: 0-13-120650-8.
7. Daniel D. Chiras, John P. Reganold, Oliver S. Owen, Eau Claire, Natural Resource Conservation: Management for a Sustainable Future, 8/E, Publisher: Prentice Hall, 2002, ISBN: 0-13-033398-0.
8. Robert Ristinen, Boulder Jack Kraushaar, Energy and the Environment, John Wiley and Son, 1999, ISBN: 0-471-17248-0.