Fall 2012

Engi 9614: Special Topics in Environmental Engineering: Renewable Energy and Resource Conservation

Instructor: Dr. Cynthia Coles
Room: EN 3004
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Lectures: Wed., Fri., 11:45 a.m.-1:00 p.m.
Room: EN 4020
Office Hours: Tues., 1:15 - 2:15 p.m.
Thurs., 1:15 - 1:45 p.m.
Fri., 1:00 - 1:30 p.m.

Recommended Book: Renewable Energy and Climate Change, V. Quaschning, Wiley, 2010,

Reference Books:

1) Natural Resource Conservation: Management for a Sustainable Future, 10th Edition, D.D. Chiras and J.P. Reganold, Prentice-Hall, 2010
2) The Leap: How to Survive and Thrive in the Sustainable Economy, 2011, C. Turner, Random House Canada (some energy related details)
3) Simon & Schuster Handbook for Writers, Fourth Canadian Edition, 2005, L. Q. Troyka and D. Hesse, Prentice Hall (for help with your writing)

Course Description: Maximizing energy efficiency, harnessing renewable energies, optimizing resource conservation, and controlling population growth are necessary to address climate change and will be studied in this course. Long term planning, scientific and ethical decision making, and linkages between energy and resources will be stressed.

Course Outline:

1) Introduction, saving energy at home, in transportation, and by the consumer, carbon footprints calculation, becoming carbon free, renewable energy potential, human population growth and control, overpopulation, earth's carrying capacity, challenges
2) Photovoltaic energy, semiconductors, solar cells, modules, island and grid systems, development potential
3) Solar thermal energy, absorbers and collectors, systems, supplying hot water and heating
4) Large scale solar electric plants from solar thermal and solar photovoltaic systems, parabolic trough plants, tower plants, dish-Sterling plants, solar chimneys, concentrating photovoltaic plants
5) Wind power, chargers and grid connected systems, turbines, onshore and off-shore wind farms, wind data, development potential
6) Hydropower plants, types of water turbines, run-of-river plants, storage and pumped storage plants, tidal, wave and ocean current plants, global development status
7) Geothermal energy, heat plants, power plants, hot dry rock (HDR) power plants, costs, development, heat pumps, operation, compression heat pumps, economy and ecology of use

8) Biomass heating, biofuels and controversy
9) Hydrogen fuel cell technology
10) Tools for a sustainable future, sustainable economics, sustainable ethics, critical thinking, support for protected areas
11) Soil characteristics and formation, soil erosion and conservation, sustainable agriculture, sustainable pest control, minerals conservation, sustainable mining
12) Fisheries conservation, favourable and limiting conditions, sustainable freshwater fisheries management methods, marine fish detection, harvesting and problems, sustainable marine fisheries management requirements, precautionary approach, protected areas

Method of Evaluation

Midterm class test	20%
Renewable Energy paper	35%
Renewable Energy presentation	15%
Assignments in class	10%
Final Exam	20%

Schedule

17 October 2012, in class	midterm class test
7 November 2012, in class	Renewable Energy paper due
14 and 16 November, in class	Renewable Energy Presentations due
19 to 30 November	No work to be assigned or handed in
30 November 2012	Last class
5 to 14 December	Exam period

Other Resources:

Drop by the Writing Center at SN2053, call 864-3168 or email vryan@mun.ca for an appointment or drop in to the QEII Library Commons. For more information visit their website at http://www.mun.ca/writingcentre/about/

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Memorial University of Newfoundland Calendar, 2012 – 2013, Section 3.12.4 Academic Offences

FALL 2012 SCHEDULE, Dr. C. A. Coles

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9:00 9:50					
10:00 10:50					
11:00 11:50			**Engi 9614 EN 4020 11:45 am – 1:00 pm**		**Engi 9614 EN 4020 11:45 am – 1:00 pm**
12:00 12:50		**Engi 9601; Envs 6004 EN 4008 12:00 noon – 1:15 pm**		**Engi 9601; Envs 6004 EN 4008 12:00 noon – 1:15 pm**	
1:00 1:50		**Office Hour EN 3004 1:15 pm – 2:15 pm**		**In Office EN 3004 1:15 pm – 1:45 pm**	**In Office EN 3004 1:00 pm – 1:30 pm**
2:00 2:50					
3:00 3:50					
4:00 4:50					

Engi 9601: Envs 6004: Environmental Pollution and Mitigation
Engi 9614: Special Topics in Environmental Engineering: Renewable Energy and Resource Conservation