

**ERS 218: Introduction to Sustainable Environmental and Resource Systems
Fall 2000**

Course team:

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Course WWW site: www.fes.uwaterloo.ca/crs/ers218/ The course WWW site has much additional material for the course. Most of the course lectures will be posted there as PDF files. The course WWW site will be updated at least weekly. **Students are expected to check the course WWW site** at least once a week for details about weekly lectures, readings for the week, course news, etc.

Course summary:

The purpose of this course is to investigate the environmental and resource systems upon which we depend for life support. We will examine patterns and trends in major environmental systems and natural resource use, in the context of sustainable development. Local, regional and global systems will be examined.

Course syllabus:

SYSTEMS: System descriptions of resource systems with emphasis on the issues of scale and type. The basics of a thermodynamic description of a system. The first and second law, lifecycle costing, full cost, supply versus demand side management.

ENERGY: Resources, consumption patterns, technologies, supply and demand side management.

WATER: Resources, consumption patterns, technologies, supply and demand side management.

SOLID WASTE : Waste sources, production patterns, technologies, supply and demand side management.

HOUSEHOLDS' IMPACTS: An integrated description of a household's resource use.

ECOLOGICAL FOOTPRINT: Our footprint on the planet.

DYNAMICS OF COMPLEX SYSTEMS: The notion of hierarchy attractors, flips, uncertainty, and self-organization.

WHAT IS SUSTAINABILITY?: A review of the concept of sustainability.

ECOLOGICAL INTEGRITY: A review of the concept of ecological integrity, the ecological normative principle for sustainability.

SUSTAINABLE LIVELIHOODS: The social-economic normative principle for sustainability.

AN ECOSYSTEM APPROACH: Thinking about humans on the planet as part of a larger ecosystem. Integrating ecological realities with societal needs.

INDUSTRIAL ECOLOGY: Using an ecosystem approach to make industry and institutions sustainable.

REVIEW AND INTEGRATION.

Course reader and text:

The course reader and text are available in the university bookstore. Course readings for specific weeks will be announced on the course WWW site. The course text is *The Nature of Economies* by Jane Jacobs.

Course assignments and assessment:

1) Book Review -- 20 per cent

Review a book related to some aspect of environment and resource systems and sustainability. You must submit the title and author of the book for approval by 27 September. (E-mail the information to the TA, Geeta Vaidyanathan, gvaidyan@fes.uwaterloo.ca, with the subject line: 218 book review) The review should be both a summary of the book's major message(s) and a critique of its major strengths and/or weaknesses. The review should be between 1000 and 1500 words in length.

Due date: Tuesday, 10 October

2) Personal System -- 30 per cent

You will describe the resource system which you personally depend on for both the things you consume and your waste disposal. The point of the exercise is to gain an understanding of your biophysical

relationship with the rest of the planet. This is a preliminary step to understanding the sustainability of your lifestyle.

Your description will take the form of a systems description as discussed in class. You will identify all the inputs to your personal system and trace them back as far as you can. Similarly you will trace where your outputs go. Your description will take the form of systems diagrams and descriptive text. You will need to consider different *types* of descriptions as well as different *scales* of description. Where possible actual numbers should be assigned to the flows.

We recognise that in some instances it will be impossible for you to trace some flows very far. Identifying the reasons why you cannot trace the flows is as important as actually being able to identify the flows. Such gaps in your knowledge reflect the failure of our socio-economic systems to provide you with adequate feedback about the sustainability implications of the choices you are making every day.

Due date: Monday, 6 November.

3) Take-home diagnostic -- 0 per cent

This exercise will test your understanding of basic concepts which are important for understanding the material in the course. Its purpose is to be a self diagnostic. It will give you a sense of how well you have understood the course material and help prepare you for the final exam. It will not be marked, however answers will be posted. We encourage students to form study groups to work together on on the take-home. It will be discussed in class

Distribution date: Monday 13 November

Completion date: Monday, 4 December

4) Final examination -- 50 per cent

A 'closed-book' final examination will take place at the end of the course. It will cover the entire course, including lecture content and readings. It will have a combination of questions requiring short answers and ones requiring essay answers.

Date: The final examination will take place during the regularly-scheduled final examination period

Students are required to be present during **all** of the final examination period. (This year that means till **22 December**.) Therefore students will be required to write their final examination in the course at the time scheduled during the exam period. No exceptions will be made, except for documented health reasons or family emergencies.

Policy on late submissions of assignments: Late submissions will **not** be accepted without **prior (at least two working days) written** consent of the instructor. Such consent will only be granted in extraordinary circumstances. (In other words, late assignments will not be marked.) (Computer problems, assignments in other courses, sporting events etc. are not extraordinary circumstances.)

Cheating: We encourage students to study together. However we expect each student to **individually write up assignments** on their own. Plagiarism and cheating will be dealt with to the full extent of university policy 71 (<http://www.adm.uwaterloo.ca/infosec/Policies/policy71.html>) which says in part:

Academic offences shall include (partial list):

- Cheating on examinations, assignments, work term reports, or any other work used to judge student performance. Cheating includes copying from another student's work or allowing another student to copy from one's own work, submitting another person's work as one's own, fabrication of data, consultation with any unauthorized person during an examination or test, and use of unauthorized aids.
- Impersonating another student or entering into an arrangement with another person to be impersonated for purposes of taking examinations or tests, or carrying out laboratory or other assignments.
- Plagiarism, which is the act of presenting the ideas, words or other intellectual property of another as one's own. The use of other people's work must be properly acknowledged and referenced in all written material such as take-home examinations, essays, laboratory reports, work-term reports, design projects, statistical data, computer programs and research results. The properly acknowledged use of sources is an accepted and important part of scholarship. Use of such material without complete and unambiguous acknowledgement, however, is an offence under this policy.
- Obtaining by improper means examination papers, tests, or similar materials, or using or distributing such materials to others.
- Submitting an essay, report, or assignment when a major portion has been previously submitted or is being submitted for another course without the express permission of all instructors involved.