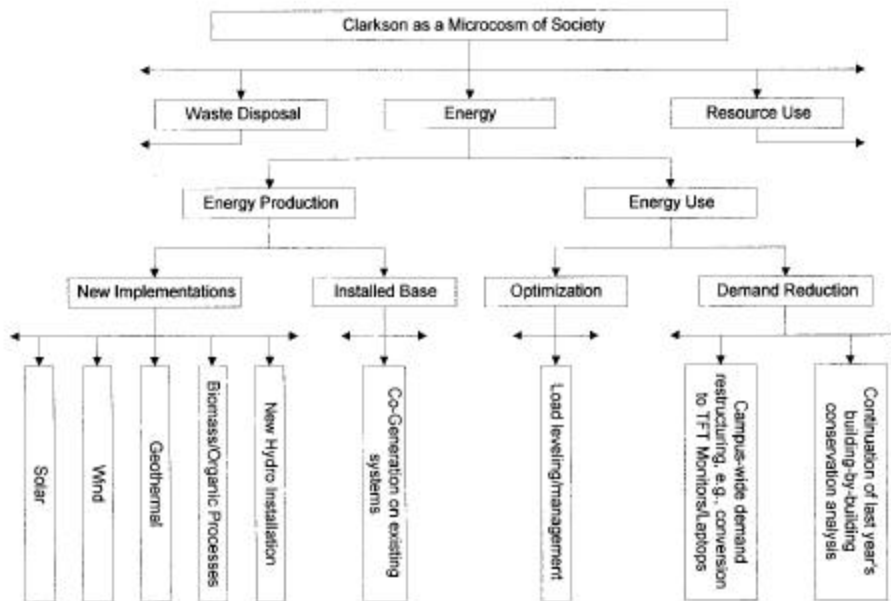


Topic

The framework for the course is “Clarkson as a microcosm of society.” There are a broad range of problems facing both Clarkson and society in general, for example, waste disposal, resource use, and energy. An examination of the range of issues associated with solving these problems for Clarkson also will provide an introduction to the complexity and central decision points *re* these problems in society at-large.

The particular problem area for this course is energy, and you will be looking at several of the issues that would enter into a comprehensive solution to Clarkson’s total energy problem. Such a comprehensive solution would answer the question, “What is the optimal mix on Clarkson’s campus of new energy production technologies, improvements and increases in efficiency in our existing energy production technologies, optimization of energy use patterns, and reduction in demand for energy?” The specific topics that we will be addressing are a sub-set of the issues that must be evaluated and synthesized in order to decide this optimal mix. The following diagram maps the course within the general framework and problem area; the specific topics for the year are drawn from the bottom leaves. These are: wind energy, solar energy, geothermal energy, hydro energy, and co-generation/load leveling.



One consequence of this course design is that you will not reach closure in two senses, but will reach it in another. Since there are nine bottom-most leaves listed (and others not listed), you will not complete the analysis necessary to determine an optimal energy production/use mix for Clarkson, nor

will you be in a position propose this mix. However, you can (and we trust will) develop your topics to the point where they can inform a future decision *re* Clarkson's overall optimal energy mix. As such, this year's course is designed to be part of a larger effort that will ultimately ground an important decision for Clarkson, and within this framework, last year's course also contributes to this overall effort.

Course Design

1. This is a problem-based learning course. This means, among other things, that the teaching team sets the problem and thereafter serves as mentors and consultants, and **you** are responsible for locating and learning the information, concepts, methods, and approaches that you will use to solve the problem.
2. Student teams of 7-8 members each will have responsibility for one of the topics from inception to conclusion.
3. Students will report their conclusions to an outside audience of decision makers. Oral reports will be made to the Clarkson Board of Trustees during their October Board Meeting, and final written reports will be submitted to these Trustees at the end of the course. We anticipate that the Trustees will raise issues and ask questions in October, and the written report will have to address these. In addition, there will be end-of-course oral reports to Cabinet-level Clarkson administrators, who will also receive the written reports.
4. The reports for each of the groups will follow the same template. Students and the teaching team will jointly develop this template, but the major components will include a) scientific and technical basis, b) feasibility analysis within the Clarkson context, c) a set of data for comparative use, and d) an account of important (in the Clarkson context) non-technical issues.
5. Each student team will have a faculty member as mentor. This faculty member will assign the grade for the students in his group. The factors that determine the grade will be the same for all groups, and these factors will include a) feedback from the outside decision makers (client satisfaction), b) completeness of the report *vis-à-vis* the template (report adequacy), c) attendance and participation, d) an individual essay that critically reflects on the conclusions reached during the team study.
6. One class session per week will be used for whole-class activities, e.g., the teaming and scheduling training, brief project updates from the teams, lectures about topics of common interest/need, etc. The other class session will be devoted to the mentors meeting with their teams.
7. We will use a course web site for communication between and within teams, and each team will need to adopt a procedure for posting their materials.

Deliverables

The course work is as follows:

- 2 oral reports by each team – 1 interim to the BOT in October and 1 final at the end of the semester.
- 1 final written report by each team – there will, of course, be many interim pieces that will be produced during the preparation and completion of this report and the oral reports, and much of this work will have individual responsibility.
- 1 individual essay.

Grading

The final course grade will be based on the following factors.

1. Client Feedback – 25%
Your Board of Trustee and on-campus Cabinet audiences will give a rating for your oral presentations. You will have input to the design of the rating instrument. The BOT members will also provide feedback on your written reports, especially *re* your responsiveness to the comments and suggestions they made on the oral progress reports.
2. Participation – 15%
At a minimum, excellent participation means that you attend the class and team meetings. Beyond this, we will use one of the standard intragroup evaluation techniques that have been developed for problem-based learning.
3. Oral and Written Reports – 50%
Each team's instructor/mentor will evaluate the quality of the oral and written reports, including the detailed work culminating in these.
4. Essay – 10%
The detailed topic, along with grading criteria, will be distributed later.