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Renewable Energy, Technology, and Resource Economics Project

ENGR 3060 (3 credits / 45 hours)

Iceland: Renewable Energy, Technology, and Resource Economics

This syllabus is representative of a typical semester. Because courses develop and change over time to take advantage of unique learning opportunities, actual course content varies from semester to semester.

Description

In this project students familiarize themselves with recent research in renewable energy, technology, and resource economics, and with the methodologies employed in energy and sustainability studies. Students select and analyze a relevant issue in renewable energy in consultation with program faculty. Each student conducts research to produce an original academic paper and presents their results to the class. The course gives students the opportunity to engage on a deeper level with one of the topics covered in the seminar and to develop their academic skills. Support is provided throughout the project by program faculty, particularly in aiding students in finding resources in Iceland. This course runs parallel to the Renewable Energy, Technology, and Resource Economics seminar throughout the duration of the program.

Expected Learning Outcomes

The *Renewable Energy, Technology, and Resource Economics Project* course comprises 45 hours of instruction (3 credits). Upon completion of the course, students will be able to:

- Design a project proposal;
- Develop a research question and define methodology;
- Gather relevant research and data and interact with experts in the field;
- Carry out original analysis;
- Compose a coherent discussion;
- Communicate research findings to an audience.

Course Schedule

Students will be provided a detailed course schedule during orientation on the program. Please be aware that topics and excursions may vary to take advantage of any emerging events, to accommodate changes in our lecturers' availability, and to respect any changes that would affect student safety. Students will be notified if this occurs.

Week 1 - 2

Students work with the Academic Director and Program Assistant to identify interests and choose a topic that is of relevance to energy issues in Iceland and that can be applied elsewhere. Time is scheduled in which the students discuss their ideas with the academic

director, but students are also encouraged to seek support with both the academic director, other members of program faculty, and others who can provide insight into the field.

Week 3
Students develop project proposals that outline the research question, methodology, and sources to be used to answer the research question. Students meet regularly with program faculty for guidance. Proposals are submitted and graded at the end of the third week. Students may work either individually or in groups of 2 – 3 students. NB: Group papers and presentations will have different expectations (e.g. longer word count, more literature resources, longer presentation time). Group members will evaluate each other at the end of the project.

Week 4, 5, and 6
In these weeks, time is dedicated to the individual research projects, and students focus on collecting relevant research and data. The academic director facilitates student contact with appropriate sources. Field research is strongly encouraged. Students conduct their analyses and write their research papers. Drafts can be submitted for review by the academic director in week 6.

Week 7
Students present their research projects to the rest of the class and invited guests.

Evaluation and Grading Criteria
Evaluation is based on successful completion of each component of the individual research project. Grade is determined by:

Research Proposal (20%):
A research proposal contains an introduction to the problem being examined, an explicit research question, a review of relevant literature, and an appropriate methodology and research design with which the student will answer the research question. A short discussion on limitations to recognize and acknowledge parameters of the research project is recommended.

Research Paper (60%):
The research paper (4000 – 6000 words) communicates the context of the problem being examined, presents analysis of data collected, discusses the issue in a relevant way, and draws original conclusions from the discussion. You should prepare and format the paper as if you were submitting it to the journal *Energy, Sustainability, and Society* (see the Guide for Authors here: https://energsustainsoc.biomedcentral.com/submission-guidelines/preparing-your-manuscript/original-articles). NB: group papers should be at least 5000 words. Word count does NOT include references or tables and figures.

General Outline of Research Paper

1. Introduction: present your research question and provide enough background information to establish why this is an interesting and relevant problem to study. This section includes a literature review that examines what we already know about this issue, what questions surround the issue, and how other studies have addressed this issue. It might also examine where else has this issue arisen and what has been written about it? It should end with a clear statement of your research questions and your paper's outline. For your purposes, this section should include at least six sources per author from scholarly sources (e.g. peer-reviewed academic journals and government reports).

2. Methods and Data: How are you answering your research question, and what data do you use to do this? Describe data sources, methods of collection, and any limitations of the data. Your methods will depend on the aspect of the issue that is your main focus, and could include approaches covered in the program. For example:
    a. For engineering aspects, describe how you approach the design question, what formulas you use to calculate results;
    b. For economic aspects, describe whether you are calculating a benefit-cost ration, a net present value, a levelized cost of energy, a cost of conserved energy, a local economic impact, etc., and present the relevant information.
    c. For environmental and policy aspects, describe what measures you might use to assess impacts or how you would analyze policy alternatives.
3. Results: Based on your methods and data, what is the answer to your research question? Present calculated values, estimates of impacts, results of analysis, statistics, etc..
4. Discussion: What are the broader implications of your results, and what recommendations do you make? When possible, connect your results to those of other studies you identified in the literature review. In this section you should also discuss aspects of your issue that were not your main focus, for example, if you choose to do an engineering and economic analysis, here you could discuss social and policy aspects of the issue. Describe any limitations of your findings.
5. Conclusion: Briefly reiterate your research question and findings. What is the reader's take home message? Discuss possible future research in this area (e.g., aspects of the issue you did not study, or where your results are inconclusive). Describe your study in the context of a larger renewable energy transition.

Project Presentation (20%):
Student does a presentation on their design project (approximately 15 minutes), and articulates the issue, its context, the analysis, the findings, and a reflection on the research process. Student responds to questions from the class and the academic director.

Assessment:

Research Paper	60%
Research Proposal	20%
Project Presentation	20%

Grading Scale

94-100%	A	Excellent
90-93%	A-	
87-89%	B+	
84-86%	B	Above Average
80-83%	B-	
77-79%	C+	
74-76%	C	Average
70-73%	C-	
67-69%	D+	
64-66%	D	Below Average
below 64	F	Fail

Expectations and Policies

- Have assignments completed on schedule, printed (or turned in electronically), and done according to the specified requirements. This will help ensure that your assignments are returned in a timely manner.
- Comply with academic integrity policies as specified in the SIT Study Abroad Student Handbook.
- Respect differences of opinion (classmates, lecturers, local constituents engaged with on the visits). You are not expected to agree with everything you hear, but you are expected to listen across difference and consider other perspectives with respect.

Please note: the syllabus, course content, lecturers, and readings may modified by the Academic Director in order to better suit the needs of the course and its participants. Should any change of class topics or lecturers be necessary, students will be promptly notified.

Academic Policies: SIT prides itself on providing students with an experientially based program; we hold ourselves, and our students, to the highest of academic standards. Students are asked to refer to the **SIT Study Abroad Handbook** for policies on academic integrity, ethics, academic warning and probation, diversity and disability, sexual harassment and the academic appeals process.

Disability Services: Students with disabilities are encouraged to contact Disability Services at disabilityservices@sit.edu for information and support in facilitating an accessible educational experience. Additional information regarding SIT Disability Services, including a link to the online request form, can be found on the Disability Services website at http://studyabroad.sit.edu/disabilityservices.