

SS 2315 – Engineering & Design for the Developing World

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Office Hours: MW 10:30-12:00, Th 2:00 – 3:30, or by appointment

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Catalog Course Description

Engineering design in the developed world takes for granted the availability of several key resources, namely construction material, water and electricity. This class will examine engineering design in the absence of these resources. The course will focus on the development of shelter and sanitation in an efficient manner. Understanding the total energy cycle of a structure will be emphasized, as well as multiple alternative energy solutions. Additional material on topics such as developing solutions for extreme low cost, high population densities and ecological sustainability will also be covered.

This course involves a heavy lab component. Students will work on interdisciplinary teams to design and build energy efficient homes, sustainable sanitation options and investigate alternative energy systems. This course is only offered at SMU-in-Taos during the summer.

Pre-requisite: Physics I

Co-requisites: SS2XX (Environmental Field Methods)

Textbook & Other Related Material

Textbook

Field Guide to Appropriate Technology; Editors: Barrett Hazeltine, Christopher Bull; Academic Press, 2003

References

Prerequisites

Physics I

Restrictions

This course will only be taught in SMU-in-Taos

Enrollment is by registration and requires instructor approval.

Course Objectives: This course is intended to demonstrate the specific challenges of engineering in the developing world. Students should gain a better understanding of the entire life cycle of a design, as well as understand the complexities of sustainable design. The engineering design process, creative problem solving and multi-disciplinary engineering will be emphasized as well.

Laboratory:

This class will feature a weekly lab component that will require manual labor, physical activity such as hiking, and basic tool use. Only students comfortable with these activities should enroll in the course.

Class Schedule:

- Overview of the Developing World 3
- Engineering Design Process 3
- Efficient Shelter Design 12
- Water Systems 12
- Electrical Power Systems 12
- Designing for the bottom billion 6

Course Grading:

In Class Assignment %15

Laboratory Reports 35%

Final Report Rough Draft 15%

Final Project 35%

Grading Policy

All homework and reports must be turned in prior to the start of class the day they are due. Assignments that are turned in late are docked 20% per day, no exceptions. I only accept reports electronically, you may submit pdf files, Microsoft Word files, Open Office Writer files or LaTeX files. The computer labs have Microsoft Word, and Open Office is a free download if you do not have one of these programs already.

Student Support

The Lyle School wishes to be a safe environment for learning and growing. In order to help students navigate their way through college the Lyle School has a policy in place to catch students who may be struggling. One of the key features of this policy is attendance. I will be taking attendance every day in class, if you miss a full week of courses and do not contact me, I will take that as an indicator you are having problems and notify the University that I have concerns. If you miss a week of classes due to illness, a trip or any other reason please let me know so we can avoid confusion. This policy is in place to protect you yet be unobtrusive. If you ever have issues and need help, the SMU Office of Student Life is also available.

ABET Outcomes

A,E,G

Disability Accommodation

Students needing academic accommodations for a disability must first be registered with Disability Accommodations & Success Strategies (DASS) to verify the disability and to establish eligibility for accommodations. Students may call 214-768-1470 or visit <http://www.smu.edu/alec/dass> to begin the process. Once registered, students should then schedule an appointment with the professor to make appropriate arrangements.

Religious Observance

Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Excused Absences for University Extracurricular Activities

Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)

Academic Honesty:

Academic dishonesty may be defined broadly as a student's misrepresentation of his or her academic work or of the circumstances under which the work is done. This includes plagiarism in all papers, projects, take-home exams, or any other assignments in which the student represents work as being his or her own. It also includes cheating on examinations, unauthorized access to test materials, and aiding another student to cheat or participate in an act of academic dishonesty. Failure to prevent cheating by another may be considered as participation in the dishonest act. I am not forgiving of cheating. I take this matter very seriously, so don't push me on it.

The Honor Code of Southern Methodist University (from SMU student handbook):

Intellectual integrity and academic honesty are fundamental to the processes of learning and evaluating academic performance; maintaining them is the responsibility of all members of an educational institution. The inculcation of personal standards of honesty and integrity is a goal of education in all the disciplines of the University. The faculty has the responsibility of encouraging and maintaining an atmosphere of academic honesty by being certain that students are aware of the value of it, that they understand the regulations defining it, and that they know the penalties for departing from it. The faculty should, as far as is reasonably possible, assist students in avoiding the temptation to cheat. Faculty must be aware that permitting dishonesty is not open to personal choice. A professor or instructor who is unwilling to act upon offenses is an accessory with the student offender in deteriorating the integrity of the University. Students must share the responsibility for creating and maintaining an atmosphere of honesty and integrity. Students should be aware that personal experience in completing assigned work is essential to learning. Permitting others to prepare their work, using published or unpublished summaries as a substitute for studying required materials, or giving or receiving unauthorized assistance in the preparation of work to be submitted are directly contrary to the honest process of learning. Students who are aware that others in a course are cheating or otherwise acting dishonestly have the responsibility to inform the professor and/or bring an accusation to the Honor Council.

Students and faculty must mutually share the knowledge that any dishonest practices permitted will make it more difficult for the honest students to be evaluated and graded fairly, and will damage the integrity of the whole University. Students should recognize that their own interest, and their integrity as individuals, suffers if they condone dishonesty in others.

