

ARCH 621 – ENERGY OPTIMIZATION IN BUILDING DESIGN
Professor Jeff S. Haberl, Spring 2010

Webcast Class: M,W,F from 9:10 – 10:00 a.m., WERC 049
Office Hours: M,W,F 8:00 – 9:00 a.m., and 10:00 – 11:00 a.m.,
or by appointment,

Dr. Haberl can be reached in the Langford Architecture building, room #A131,
or at the Energy Systems Laboratory offices in Wisenbaker, room #053,
Office ph# 979-845-6507, Lab ph# 979-845-6065, FAX# 979-862-2457,
or by email: jhaberl@tamu.edu

Course Description: This course will introduce the student to whole-building energy simulation and energy optimization techniques using computer simulation, including the hourly simulation of dynamic thermal envelope loads, shading analysis, primary and secondary system simulations, and economic analysis; emphasis on the use of the DOE-2 building simulation program.

TEXT: There is no formal text for this class. Class notes will be posted on a class folder at the College of Architecture. You will need to obtain an account at the College of Architecture to access your folder. A set of reference manuals is available on the course CD, and in electronic form in the class folder. Ready access to the complete set of manuals is necessary for best performance in this class.

Homework: *Homework is due each Monday by the end of the class.* It will be returned and discussed in class with solutions passed out. Late homework will be marked accordingly.

Final: There will be a final project review at the time scheduled for this class.

Grading Policy:

Final Project	30%
Homework	70%
Extra Credit	5%

Homework: *Homework is due each Monday by the end of the class.* It will be returned and discussed in class with solutions passed out. Late homework will be marked accordingly.

Projects: This is lecture-based class with a major student project. Therefore, there will be a significant emphasis on the student projects for the class, as well as the weekly homeworks. You will either have an individual project, a group project, or both and you will be responsible for completing the project in a professional manner. The number and type of projects will depend on the number of case studies to be covered. You will be responsible for your project and will be graded accordingly. Each student (or group of students) will make a presentation to the class concerning their project (Final presentation).

Extra Credit: Periodically, there will be extra credit problems assigned. These challenging problems are designed to help those students who feel that they need to improve their grade by performing extra work.

DOE-2 Manuals: Since this class will make extensive use of the DOE-2 manual, a copy of the manual will be posted in the Architecture TRC for access by the class. An electronic copy will be made available in the class folder. These public domain reference manuals come with the DOE-2 program. The DOE-2 program and other programs will be loaded onto selected PCs in the Architecture computer lab for use by students in the class.

Helpful hints for doing well in this class:

1. Attend the lectures. Download the lecture notes from Xavier before class. Keep your notes in a well organized notebook, or bring them on your laptop. Try not to fall behind.
2. Ask questions in class. Make sure that you have copies of the solutions to the homework problems and that you understand how to solve them.

3. Drop-by during office hours and ask questions, make an appointment and drop-by, or email me if you have questions.
4. You are allowed to work in groups to obtain a better understanding of the homework. *However, your performance on your project will be based on what you know* and therefore it is good idea to make sure you understand how to solve the homework problems by yourself.

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NOTE ABOUT PLAGIARISM: Plagiarism consists of the passing off as one's own ideas, words, writings, etc., which belong to another. In accordance to this definition you are committing plagiarism if you copy the work of another person and turn it in as your own. If you have questions about plagiarism please consult the Texas A&M University Student Rules book, under the section "scholastic dishonesty".

"An Aggie does not lie, cheat or steal or tolerate those who do.", www.tamu.edu/aggiehonor

NOTE FOR STUDENTS WITH DISABILITIES: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>.

NOTE ABOUT ABSENCES: The university views class attendance as an individual student responsibility. Students are expected to attend class and to complete all assignments. Instructors are expected to give adequate notice of the dates on which major tests will be given and assignments will be due. The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for absence. Students are advised to consult the University regulations for a list of authorized absences.

Course outline

Section:	Subject:
1	Introduction to simulation
2	Introduction to the DOE-2 program
3	LOADS Program: location, schedules
4	LOADS Program: walls, roofs, windows
5	LOADS Program: space-conditions, space
6	LOADS Program: exterior walls, interior walls
7	LOADS Program: windows, shading
8	LOADS Program: reports, hourly reports
9	LOADS Program: parametrics
10	SYSTEMS Program: schedules
11	SYSTEMS Program: zones, zone fans
12	SYSTEMS Program: systems types
13	SYSTEMS Program: quadratics
14	SYSTEMS Program: reports, hourly reports
15	PLANT Program: schedules
16	PLANT Program: equipment
17	PLANT Program: quadratics
18	PLANT Program: reports, hourly reports
19	ECONOMICS program
20	ASHRAE Economics calculations
21	EQUEST program