ARCH 421 – Energy & Sustainable Architecture – Spring 2010
Professor Charles H. Culp, P.E., Ph.D., FASHRAE, LEED-AP

Class: Tuesday and Thursday, 9:35 AM – 10:50 AM, Williams009

Office Hours: Tues., Thurs. 11:00 PM – 12:30 PM
Mon.,Wed. 12:30-2:00 or by appointment.
E-mail or phone to make an appointment for other times.
I will make myself available during evenings and/or week-ends if needed.

I can be reached in the Architecture Department, Room A-443,
Office Ph: 979-458-3600
Email: cculp@tamu.edu

TEXT: LEED-NC 3.0 Reference Guide, purchase from the USGBC.
My notes will also be used for class.
Additional information will be included on Xavier and from:
USGBC's web site
ASHRAE Standards 90.1-2007, 55-2004 and 62.1-2007
ASHRAE's Advanced Energy Design Guides (available free at www.ASHRAE.org)
ASHRAE publications (Standards and Journal Papers)
Manufacturer's product information

Goal: Prepare students for analyzing green building design, which includes site selection, water usage, energy usage, material selection, indoor environmental quality and to produce a complete analysis of a building using the US Green Building Council's (USGBC) LEED-NC rating.

Course Description: Develop a deeper understanding of how various design decisions impact sustainability and energy efficiency with in-class lectures and by taking a project to do an "academic" LEED-NC rating. An interdisciplinary approach will be taken in that students will team with a design studio architect and perform the LEED-NC rating on the architect's design. Material from the US Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system, ASHRAE's Green Guide and ASHRAE's Advanced Energy Design Guide may be used as reference material. Students will learn how to simulate the energy use of a building using eQuest and complete a LEED-NC rating. Students will be expected to review and apply reference material, standards and USGBC material in performing their LEED-NC rating. Students will learn to make professional presentations and write LEED documentation to professional requirements.

Prerequisite: None.

Requirements: Access to a computer for running simulations is required. Free simulation software (eQuest) will be provided by the US Department of Energy.

Objectives: Deeper understanding of sustainability and energy systems will also prepare the student for designing and rating high performance, energy efficient and sustainable buildings. A basic knowledge of environmental systems will be required.

Homework: Homework will be given weekly. It will be returned and discussed in class. Late homework will be marked down 10% per day late. Late homework may not be accepted after the answers are issued / discussed.

Tests / Quizzes: Quizzes will be given regularly to prepare you for the USGBC exam. There may be a mid-term exam that covers using the simulation tool and LEED-NC specifications. Make-up exams will not be given for unexcused absences. The LEED quizzes and/or tests will be closed book. You must work on exams by yourself. A full LEED-like exam will be provided at the end of the course to better prepare you for passing the LEED exam.

Final: The final includes a full LEED report and presentation. A final exam may also be given and will be closed book. I strongly urge you to organize your notes as you go. The class notes will be available on the class Xavier site.
This class emphasizes the final written project and final presentation for the grading, just like you will be "judged" in your professional career. Winning the assignment / job will keep your firm viable and active. Nonetheless, you need to schedule your time and plan your activities so that you have time to prepare the final write up and presentation. You will be challenged by the architect you will be working with because they are often late in getting you material. You'll learn to manage the project.

LEED-NC Rating Project: We will perform a detailed LEED-NC analysis and rating on a building being designed by a design studio, which can be a senior or graduate design studio often with participation from CoSci. Each LEED student will work with a design team. Each student will be expected to work with the team as the LEED rater. You will be responsible for all coordination and management activities. Presentations will be made on your rating at the end of the semester. This report will become part of your portfolio.

Extra Credit: Attendance is required since you will be working in teams. I give extra credit for class attendance. Five (5) consecutive days of attendance will earn 1 point (of up to 5).

Grading Policy: (see the SEED template for detailed grading)

Final Written Project	60%
Final Presentation of Project	25%
Homework/In Class Presentations	15%
Extra Credit	5%
Total	105%

Grade Earned:

90% – 105%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
00% - 59%	F

In the Final Written Project, you must earn 50 LEED Credits to receive an A for the Project. You must also earn 50 LEED Credits to qualify for an A for the course. Specific requirements for the credits required are in the SEED Templates which are used as part of this class.

Helpful Hints for Doing Well in this Class

1. **Read assigned material before class**. Reading material will be assigned to assist you in building your "green" library of references. Please read the assigned material before we cover the material in class. Your comprehension of the material will improve substantially.

2. **Turn in homework on-time**. Working the homework will bring out areas that you understand and that you may need help in.

3. **Attend the lectures**. Copies of the lecture notes and all material covered in class will be available on the class Xavier site. Keep your notes in a large, well organized notebook.

4. **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. The exams and final will primarily draw on the material used in these problems and the lecture notes.

5. **Drop-by during office hours and ask questions**. E-mail or phone to make an appointment and drop-by during other hours. I will make myself available during evenings and/or week-ends if needed. I will be using e-mail to communicate to the class, so students in the class are required to check their Neo account daily.

6. **You are encouraged to work in groups to obtain a better understanding of the homework**. However, you are expected to turn-in your own homework that you have done. Your career performance on the tests 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.

7. **I use the Aggie Honor System for tests**. You will certify that you have completed the test by yourself. You are expected to perform all work on the tests by yourself.

COPYRIGHT NOTICE: The handouts in this class contain material that has been photocopied with permission from the publisher and are therefore copyright. "Handouts" includes all material generated for this class, which includes, but is not limited to: syllabi, quizzes, exams, in-class notes and handouts, review sheets and assignments. Therefore, the copyright material in this class should not be copied without prior permission from the instructor.

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".

AGGIE HONOR CODE: Please refer to the new University's Honor System web site (//www.tamu.edu/aggiehonor/). This code has detailed policies and procedures on how professors need to handle instances which violate the Aggie Honor Code. Please read and understand the information.

"An Aggie does not lie, cheat, steal or tolerate those who do." Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the examinations, research papers and other

academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

The following pledge applies to all course work, assignment and examinations at Texas A&M University. You may be required to sign this pledge on assignments. "On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

NOTE FOR STUDENTS WITH DISABILITIES: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statue 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 accommodations of their disabilities. If you believe you have a disability requiring accommodation, please contact the Office of Support Services for Students with Disabilities in Room 126 of the Student Services Building. The phone number is 845-1637.

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.