ENRGYEGR 490/ENERGY 790 Building Energy and Water Modeling

Spring 2021

Instructor: Greg Eades
Office Hours by Appointment

Course Description:

Buildings account for over 40% and 10% of U.S. annual energy and water consumption, respectively. Therefore, it is critically important to develop and implement strategies to reduce building energy and water consumption. In this course, students will learn how to use advanced technologies such as Energy Modeling and Performance Simulation to enhance energy and water efficiency. Students will calculate energy and water uses to understand the energy and water behavior of buildings and then compare and analyze them with actual energy and water consumption data. Through the case study project, students practice optimizing building energy and water consumption.

Course Objectives:

After taking this course, students will be able to:

1. Discuss sustainable design strategies for building energy and water systems
2. Learn how to perform practical load calculations
3. Analyze building energy performance
4. Develop energy simulation models for their projects
5. Propose Energy Conservation Measures (ECMs) and Water Conservation Measures (WCMs) for their projects

Textbook:

There is no textbook required. Class notes will be provided.

Modeling Software:

eQUEST Version 3.65: https://www.doe2.com/equest/

Sakai:

Assignments and materials will be posted on Sakai. Emails will be sent using the email on file in Sakai.

Grading:

Homework	15%
Two Tests	25% Each
Case Study Project	35%

Homework:

Homework will be assigned as the course develops.

Tentative Schedule:

Week of	**Topic(s)**	**Important Dates**
Jan 18	Introduction	
Jan 25	Energy/Water Sources, Codes and Standards and Utility Rates	
Feb 1	Energy and Water Consumption	
Feb 8	Water Use Calculations and Psychrometrics	
Feb 15	Heat Load Calculations	
Feb 22	Cooling Load Calculations	
Mar 1	Renewable Energy	**Test #1**
Mar 8	Renewable Energy	**Spring Break Mar 9**
Mar 15	Water Reuse	**Virtual Facility Site Visit**
Mar 22	Energy and Water Modeling	
Apr 5	Energy and Water Modeling	
Apr 12	Energy and Water Modeling	
Apr 19	Case Study Presentations	**Test #2**
Apr 26	Case Study Presentations	