BUILDINGS AND ENERGY USE: SYLABUS

ENVIROMENTAL CONTROLS AND TECHNOLOGY DEPARTMENT

Spring 2010

Course Number/code: ECT 028_ L20449
Time: Saturday 8:00 AM – 12:00 PM
Instructor: Bill Holloway **Course Term:** 8 weeks (1/2 semester)
Office: B151
Phone: (510) 769-0774 message **Units:** 2

Course Description: This course introduces Energy Use Basics, Effects of Building Design on Energy Use, Identifying effective strategies to optimize buildings systems efficiencies, correct appliance applications and benefits. Topics include but are not limited to terminology, understanding and identifying different types of HVAC equipment, construction basics, window design, lighting fundamentals, photovoltaic.

Student Outcomes:
1. Understand basics of energy use in a building.
2. Recognize where improvements and savings can be made.
3. Identify basic design and efficiencies of HVAC equipment.
4. Communicate energy efficiency suggestions to occupants and building managers.

Suggested preparation: Basic Math, Electricity and Instrumentation, and Computer Literacy

Text: 'Residential Energy' by John Krigger and Chris Dorsi 4rd edition

Supplies Needed: Calculator, note book, sharp pencil, a clue

Required Text Books (1)

Residential Energy: Chapters 1 - 10

Evaluation: The following classroom work and projects will be evaluated and graded.

1. 4 quizzes (every week or two)	150
2. Midterm	100
3. Final Exam	200
Total:	**450 points**

Grading: A = 450 – 405 B = 404 – 360 C = 359 – 315 D = 314 – 270 F < 270

Attendance: Students may be dropped from the course if the number of absences exceeds two days worth of class meetings. However, extenuating circumstances may warrant consideration. The department head will decide what are extenuating circumstances. Tardiness (more than 30 minutes) will count as a missed day unless previous arrangements are made with the instructor. Missing more than one day will effect a student's grade.

Conduct: No cell phone use is allowed in class. Returning calls/texting must wait until break or the end of class. Any other phone use must be cleared with the instructor before each session starts. **Cell phone calculators are not acceptable, you must have a real calculator.** Laney is a tobacco free environment, including smokeless tobacco (chaw).

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HINT: reading the chapters before the session will expedite absorption of the material. Read chapters before attending class.

Wk 1: Introduction to Energy Residential Energy: Intro, 1,
- Heat Transfer
- Potential vs. Kinetic & Power vs. Energy
- What you pay for
- Energy Sources
- Understanding Efficiency & PV
- Reading the Utility Bill

Wk 2: Construction Basics: Building Envelope RE: 2, 3, 4
- Framing Types/Construction Nomenclature
- Infiltration/Envelope Sealing
- Insulation/Types & Applications
- Correct Installation Techniques & Title 24 requirements
- **QUIZ 1**

Wk 3: Windows & Lighting RE: 5, 7
- Window design & Window efficiency
- Lighting
  - Residential
  - Commercial
- **QUIZ 2**

Wk 4: Heating and Cooling Basics RE: 6, 8, 9 + pg. 195,196
- What is a system supposed to do?
- Sizing
- Getting your monies worth
- Motors & Pools
- Water Heating
- **MID-TERM (weeks 1 – 4)**

Wk 5: Heating Systems RE: 6
- Forced Air
- Hydronic Types
- Radiant
- Fireplace/Wood Stove/Pellet Stove

Wk 6: Cooling Systems RE: 8
- SEER vs. EER
- Air Source AC
- Air Source Heat Pumps
- Ground Source Heat Pumps
- Evaporative Cooling
- **QUIZ 3**

Wk 7: Appliances RE: 7
- Laundry
- Kitchen
- Vampire Loads
- Lots of other Equipment

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QUIZ 4

Wk 8: Basics of Conducting an on-site energy audit

Final exam - cumulative