COURSE INFORMATION FORM

DISCIPLINE                Geology
COURSE TITLE              Solar Water and Space Heating

CR.HR   3      LECT HR.  3      LAB HR.  0      CLIN/INTERN HR.  0      CLOCK HR.  

CATALOG DESCRIPTION
Solar radiation applied to heating water and air, introduction to safe design and installation of solar thermal systems
with emphasis on domestic hot water.

PREREQUISITES
None.

EXPECTED STUDENT OUTCOMES IN THE COURSE

Upon completion of this course, the student will be able to:
1. Critique various types of solar thermal systems according to their key features and benefits.
2. Apply correct practices and equipment for safe installation and maintenance of solar thermal systems.
3. Use basic solar terminology correctly.
4. Predict solar position using path diagrams and a knowledge of solar movement and effects of earth tilt.
5. Measure average irradiation on a surface and convert into a variety of units.
6. Analyze angular effects and other factors impacting irradiance and irradiation.
7. Evaluate key specifications for collectors, exchangers, and pumps using manufacturer literature
8. Compare features and benefits of different collector mounting techniques
9. Identify locations for roof/ wall, foundation penetrations, and structural attachments
10. Classify purpose and operation of main mechanical and electrical BOS components (piping, fittings, insulation,
    mounting hardware, differential controller, wiring and electrical fittings)
CLASS-LEVEL ASSESSMENT MEASURES

Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.) Assessment measures may include some or all of the following: written assignments, group assignments, lab assignments, homework exercises, quizzes, exams, papers, special projects, classroom demonstrations, and a comprehensive final exam.

PROGRAM-LEVEL OUTCOMES ADDRESSED

General Education Outcomes
Specify which general education outcomes, if any, are substantially addressed by the course by completing the “Course/Program Assessment Matrix” to show the relationship between course and program outcomes and assessment measures.

Quantitative Literacy and Numeric Reasoning (ESO)
5. Interpret and apply numeric information embedded in text or real-life situations (7)

Occupational Program Outcomes
Specify which occupational program outcomes, if any, are substantially addressed by the course by completing the “Course/Program Assessment Matrix” to show the relationship between course and program outcomes to assessment measures.
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Overview of Water Heating
   A. Gas and electric systems
   B. Estimation of demand
   C. Economics and Payback Period
   D. Insulation
   E. Types of solar water heating systems

II. Solar Radiation Basics
    A. Solar terminology
    B. Sun-Earth relationships and solar position
    C. Irradiation and irradiance
    D. Basics of Site Evaluation

III. DHW Component Selection and Sizing
     A. Collectors
     B. Tanks and heat exchangers
     C. Piping and insulation
     D. Pumps, valves, controllers, and wiring
     E. Working fluids

IV. Installation and Maintenance
    A. Collector mounting methods
    B. Wiring and plumbing basics
    C. Importance of code compliance

V. Overview of Solar Space Heating

VI. Overview of Solar Pool Heating

VII. Careers