1. **Course Name & Number:** Energy Scheming, Arch 498/Arch 598 - 3 credits
   31239/31306

2. **Instructor/office/ext.:** G.Z. Brown, Jeff Kline, Tomoko Sekiguchi,
   103 Pacific Hall, University of Oregon Campus
   (541) 346-5647

3. **Meeting Time & Place:** This class is offered over the world wide web and has no
   regularly scheduled meeting time. Students can proceed at a location of their choice, however,
   submissions must be turned in by submission due dates found in the ES course handout.

4. **Meeting Format:** This class is composed of a series of exercises and two exams.

5. **Credit hours and grading:** 3 credits (graded or nongraded).

6. **ARCH 406/606 Sp Pr Energy Scheming (CRN 31164/31317):** There is a one-credit
   extension to the Energy Scheming Arch 498/Arch 598 course, which can be used to complete the
   4-credit technology cluster. For information on this class:
   [http://www.uoregon.edu/~esbl/esbl_web/1cr_ES_special_problems.htm](http://www.uoregon.edu/~esbl/esbl_web/1cr_ES_special_problems.htm)
7. **Prerequisites:**

    Arch 491/591, Environmental Control Systems, equivalent course, or permission of the instructor. Familiarity with Macintosh computers is desirable.

8. **Study Objectives:**

    Buildings use more than one-third of the U.S.'s total energy production and 70% of the electrical energy. The production of energy causes severe environmental damage ranging from destroying fish habitat to polluting the atmosphere with CO2, a prime cause of global warming.

    In this class you will learn how to design energy efficient buildings by selecting proper materials, and forming and organizing the buildings to take advantage of the sun for heating and lighting and the wind for cooling.

9. **Study Vehicles:**

    The study topics are each divided into three parts, a warm-up, an exercise, and a cool-down. The warm-up covers the same material as the exercise but is not graded. It is an opportunity to learn and practice with the exercise content before doing the graded exercise. The exercises test your ability to use Energy Scheming to understand basic phenomena and to design more energy-efficient buildings. When you finish an exercise, it is immediately graded so you know what aspects of energy design you understand and those that need more work. The cool-downs explain why the correct answers to the exercises are correct and why the incorrect answers are wrong. In the last exercise, which comprises one-third of the class, you have the opportunity to design a building of your choice.

10. **Text/Computer Platform**

    **Course can be taken on Macintosh and PC computers.**

    *Energy Scheming 3.2* software and manual

    Available at Energy Studies in Buildings Laboratory, Room 103 Pacific Hall, Department of Architecture, University of Oregon, Eugene, 97403

    Price $54.95 with student ID

11. **How to get started**

    Purchase Energy Scheming software in Pacific Hall Room 103 and receive instructions on how to begin.
12. Instructor Comment

With Energy Scheming you can think about building form and energy use together, right at the beginning stage of design. Thinking about energy at the start, when you are first making sketches of a building’s form and organization, makes it easier to consider energy all the way through the project. Thinking about energy strategies early—daylighting; passive solar heating and cooling; and cross and stack ventilation—for example, makes sense because they affect how the building looks and determine its loads and its mechanical systems. When you reduce building loads, you save energy.

Energy Scheming is a design tool, not an analysis or evaluation tool. It is designed to help you create an energy-efficient building rather than to evaluate one that’s already been designed. Its user interface lets you work intuitively, so you can experiment and generate ideas quickly while Energy Scheming takes over the calculations and evaluations.

Input to Energy Scheming requires relatively little technical detail. You use graphic tools, such as a digital tape measure to “take off” locations and dimensional data such as areas and lengths, by tracing areas from on-screen drawings. The result appears on the screen in numerical form. When you specify materials, such as brick or wood, Energy Scheming translates these into physical properties such as conductance.

Energy Scheming gives you instantaneous rule-of-thumb guidance on solar heating, ventilation, and daylighting for windows. You can simultaneously compose an elevation for appearance and size the windows for energy considerations.

Energy Scheming gives you speedy and frequent evaluations. Energy Scheming’s calculation procedures allow the kind of rapid feedback that is imperative to the beginning of the design process, when precise predictions of energy use are not critical. It proceeds rapidly because the algorithms are simplified to reduce calculation time. Very quickly you can get a “ball park” evaluation and compare alternatives. Energy Scheming evaluates the building’s loads for 24 hours for four selected days.