



- 1. Course Name & Number:** Energy Scheming, Arch 498/Arch 598 - 3 credits
10844/10903
Arch 406/606 Sp Pr Energy Scheming- 1 credit
10777/10912
- 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 their own pace and at a location of their choice. However, in the first week of classes, a one time, optional class meeting is offered to give a description of the course and answer questions.
- 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**);
plus 1 credit ARCH 406 Sp Pr Energy Scheming crn:10777 and ARCH 606 Sp Pr Energy Scheming crn:10912 (**nongraded** only).

6. Prerequisites:

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

7. 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.

8. 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.

9. Text/Computer Platform

Course must be taken on a Macintosh computer.

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

10. How to get started

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

11. 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.