REVISED SYLLABUS: **ENVIRONMENTAL STUDIES 105**
Renewable Energy and the Environment
Mel Manalis

Environmental Studies 105, Renewable Energy and the Environment, is an elective upper division course. It is a necessary course for Environmental Studies students who interested in energy as a possible career. A multidisciplinary approach is stressed in the class, developing in students a coherent conceptual knowledge about renewable energy with emphasis on solar energy. It is taught in such a way as to be of interest to liberal arts majors as well as engineers, and has been responsible for drawing new students into the ES major. How renewable energy fits with environmental-energy options in both developed and developing nations is a focus of the course.

The course begins with a brief discussion of energy use, non-solar energy sources, and an historical review of solar energy. The importance and relevance of the laws of thermodynamics to environmental-energy relationships, energy crises, and solar energy utilization are examined in detail. Both direct and indirect solar technologies are studied in terms of their effects on the physical, social and economic environments. Topics include passive and active solar heating and cooling, energy from photosynthesis, photovoltaics, wind and wave energy, ocean thermal energy conversion, and other solar electric systems. Finally, the significant relationships between energy storage, utility interfacing and solar energy use are discussed.

Student grades are based on two exams, class participation and attendance and homework.

Never doubt that a small group of thoughtful committed citizens can change the world. Indeed it's the only thing that ever has. **-Margaret Mead**

Lectures: M 5:00 -- 6:30 PM, Buchn 1930
W 5:00 – 6:00 PM, NH 1006

Instructor: Mel Manalis
Office hours: W 10:00 AM to Noon or by appointment in Bren Hall 4005

Course Grade:

Exam I	40%
Exam II	40%
attendance, class participation & homework	20%

Text:

- **Renewable Energy: Power for a Sustainable Future**
  Boyle, Godfrey.
- Reader, At Grafikart, 6550 Pardall Road, Isla Vista

Homework and Reading:
Reading Assignments will be given in class on Mondays. Homework will be given in class on Wednesdays and will be due the following Wednesday.

SPRING 2007 SCHEDULE (REVISED)**: ES 105 Renewable Energy**

Week 1	
M April 2	**Introduction**
	Film: The Power of the SUN
W April 4	**Direct and Indirect Solar Energy Technologies**
Week 2	
M April 9	**The Size of the Solar Resource**
W April 11	**Scenario Building** & **Solar Thermal Energy**
Week 3	
M April 16	**Introduction Passive Solar Energy**
	Passive Solar Energy Slide Presentation:
	"Active-Passive Solar Energy" by Dr. L. Balcomb
W April 18	**Conclusion on Solar Thermal Energy**
Week 4	
M April 23	**Biodiesel and the Environment**
	Russ Teall, President Biodiesel Industries, Santa Barbara, Ca
W April 25	**Introduction to Biomass Energy**
Week 5	
M April 30	**Review for Midterm exam**
W May 2	**Midterm exam**
Week 6	
M May 7	**Photovoltaics, Past, Present and Future**
	Mark Mrohs, Manager, Sun Power Inc., Sunnyvail, CA.
W May 9	**Photovoltaics (continued)**
Week 7	
M May 14	**Introduction to Wind Energy**
	Amir S. Mikhail, President,
	Clipper Windpower Technology, Inc., Carpinteria, Ca
W May 16	**Environmental Impacts of Wind Energy**
Week 8	
M May 21	**Wind Energy Today**
	Craig Christenson, Chief Engineer, GE Wind Inc. Tehachapi, CA.
W May 24	**Hydroelectricity**
Week 9	
M May 28	**Memorial Day Holiday**
W May 30	**The Future of Renewable Energy: Electricity & Hydrogen**
Week 10	
M June 4	**Summary & Conclusion**
W June 6	**Final Midterm Exam**