

**Civil Engineering 806 – CE806**  
**Radiometric Measurements and Modeling**  
**Course Outline – Spring Quarter 2004**

*Course Description.* CE806. 5 credits. The course is designed to give students a physical understanding of remote sensing as a system, focusing on radiometric measurements of earth surface features. The course will deal with the modeling of the flow of radiant energy from the sun through the atmosphere to the earth and its reflectance back to a measurement device or remote sensor. Concepts, techniques and applications of numerical models of radiant energy will focus on spectral flux, irradiance, radiance and modeling the interaction of light with various materials. Corrections for noise and atmospheric effects will be examined.

*Instructor:* Dr. Carolyn J. Merry  
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class website: <http://hcgl.eng.ohio-state.edu/~ceg806/>

*Office Hours:* Tuesday, Thursday: 10:30-11:30 A.M. Also, appointments can be scheduled.

*Prerequisites:* CE603 or equivalent with written permission of instructor.

*Textbook:* Liang, S. (2004) *Quantitative Remote Sensing of Land Surface*, John Wiley & Sons, Inc.: New York, New York.

*Requirements:* Students are expected to attend each class and perform the computer labs. Class is held from 8:30-10:18 P.M. Tuesday and Thursday in EA295. After receiving initial instructions during the class period, the labs can be done independently.

Grading is as follows:

- 45% – 1 midterm exam and a final exam
- 30% – Laboratory exercises (4)
- 25% – Project paper

**Course Outline – CE806 - Weekly Schedule  
Spring Quarter 2004**

<i>Week</i>	<i>Topic</i>	<i>Readings</i>	<i>Lab</i>
1	Introduction Nature of electromagnetic spectrum	Liang: Chpt 1	Introduction to Visual Basic (5%)
2	Matter-energy interactions: general; EMR response: water properties		
3	EMR response: soil/rock; EMR response: vegetation	Liang: Chpt 3, 4	Introduction to Visual Basic/ArcObject (5%)
4	Atmospheric optical properties; Atmospheric correction methods	Liang: Chpt 2, 6	
5	Review; Midterm		Field measurements; Atmospheric correction modeling (10%)
6	Satellite sensor characteristics; sensor calibration	Liang: Chpt 5	
7	Validation of ground measurements with remote sensing sensors	Liang: Chpt 12	Numerical processing (10%)
8	Image spectroscopy; methods		
9	Applications: water resources, agriculture	Liang: Chpt 8, 13	Project
10	Applications: forestry, geology	Liang: Chpt 13	