

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY
SPRING 1997

Senior
SDSM Monitoring +
Modeling

Course: CEE 499/599 Monitoring and Modeling Earth Systems

Lecture: Tues. and Thur. 2:00 to 2:50 p.m., CB 106

Lab: Thur 3:00 to 6:00 GIS Lab (MI Building)

Text: Verbyla, David L., 1995. Satellite Remote Sensing of Natural Resources, CRC Lewis Publishers, Inc., Boca Raton, Florida.

Woodward, F.I., 1992. Global Climate Change The Ecological Consequences, Academic Press, New York, New York.

Instructors: Dr. Ron Welch, M 211D
Dr. Scott J. Kenner, CM 309A

Teaching Assistants: Trevor Davenport
Ted Heath

Course Objective: This course is intended to be an interdisciplinary course for upper level undergraduate and graduate students. The course has two goals: (1) to introduce methods for regional and global scale monitoring of earth systems, and (2) to experience concepts involved in formulating, parameterization, and validating models of earth system behavior. Part 1 will focus on satellite remote sensing techniques and accessing global data bases. Part two will include an introduction to coupled atmospheric-hydrologic process models and simplified whole-earth global change processes models.

Basis of grade: Each half of the course will consist of homework/labs and one exam. The homework for each half of the class will be weighted 25%. Thus, the total homework grade is 50%. One exam will be given about midterm covering the first half of the class. A second exam will be given at the end of the semester covering only the second half of the class. Each exam is worth 25% for a total of 50%. Final grades will be assigned following a scale of 90 - 100 A, 80 - 89.9 B, 70 - 79.9 C, 60 - 69.9 D. Plus or minus grades will be used as deemed appropriate.

SCHEDULE:

WEEK	DAY	TOPIC	READING
1	1/14 - 1/16	Basic Concepts, Satellite orbits, Spatial resolution	Chap 1 & 2 Verbyla
2	1/21 - 1/23	Spectral information, Radiometric corrections	Chap 3 & 4 Verbyla
3	1/28 - 1/30	Image interpretation, basic classification	
4	2/4 - 2/6	Radiometric Enhancement, Geometric correction & enhancement	Chap 5 Verbyla
5	2/11 - 2/13	Multispectral Analysis, NDVI, Kauth-Thomas, & unsupervised classification	Chap 6 Verbyla
6	2/18 - 2/20	Supervised classification	Chap 7 & 8
7	2/25 - 2/27	Principal components, Midterm Exam	
8	3/4 - 3/6	SPRING BREAK (No Class)	
9	3/11 - 3/13	Earth System Components Spatial and Temporal Considerations Energy and Radiation	Handout
10	3/18 - 3/20	Hydrologic Cycle & Water Budgets	Handout
11	3/25 - 3/27	Interfacing with the Biosphere	Handout
12	4/1 - 4/3	Climate Change Scenarios and Response to Climate Change	Chap 1 & 2 (Woodward)
13	4/8 - 4/10	Agricultural and Land Use Responses	Chap 3 (Woodward)
14	4/15 - 4/17	Vegetation Responses	Chap 4 & 5 (Woodward)
15	4/22 - 4/24	Soil Responses	Chap 6 (Woodward)
16	4/29 - 5/1	Coastal Zone Responses	Chap 7 (Woodward)
17		FINALS	