

PS 411/511 & BSC 411/511 IMAGE PROCESSING & MODELING

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Spring Semester 2007 – Science 259

Text: John R. Jensen, *Introductory Digital Image Processing, 3rd Ed.*
IDRISI Student Manual
ERMapper Student Manual
NASA Stats Manual
Bound notebook to enter daily exercise material.

The following schedule will be followed as nearly as possible. Typically there will be lecture on Tuesdays and software practical exercises on Thursday.

<u>DATES</u>	<u>TEXT MATERIAL</u>	<u>LABORATORY*</u>
January 9, 11, 16	Chapter 1, 2 Review, Boolean Algebra	ERMapper
January 15	No Classes – Martin Luther King Day	
January 18, 23	Chapter 3, Image Processing	ERMapper
January 25, 30	Chapter 4, Initial Statistics	ERMapper
February 1, 6	Chapter 5, Display Choices	ERMapper
February 8, 13	Chapter 6, Image Corrections	ERMapper
February 27.....First Semester Exam – Chapters 1 through 6		ERMapper
March 1.....First Practical Exam		
February 15	Project Discussion	ERMapper
February 20, 22	Chapter 7, Image Enhancement, Feature Extraction	Fourier Optics
March 1, 6	Chapter 7, Image Enhancement, Feature Extraction	Fourier Optics
March 8, 13	Chapter 7, Image Enhancement, Feature Extraction	Fourier Optics
March 16	W-day	
March 19 – 23	No classes – Spring Break	
March 15, 27	Chapter 8, Image Classification, STATS	ERMapper
March 29, April 3	Chapter 8, Image Classification, Modeling, RS/GIS	ERMapper/ArcView
April 5, 10	Chapter 8, Modeling, GIS, GPS	ERMapper/ArcView
April 12.....Take-home Exam Given Out & Practical Software Exam		
April 12, 17, 19	Chapter 9, Digital Change, Modeling	ERMapper/ArcView
April 19.....Second Practical Exam		
April 26.....Take-home Exam Due		
April 24, 26	Chapter 10, GIS, Modeling	ERMapperArcView
April 27	Project Paper due (12:00 p.m. noon)	
May 1	Project Final Oral Presentation	
	(Progress and Results on Model and Applications)	

*Software exercises will primarily consist of exercises from the ERMapper student tutorial manual. However, additional work can be assigned from IDRISI, Surfer, ArcView, etc.

GRADING:

Your grade will be determined by the in-class exam (100 points), take-home exam (100 points), design and modeling project written report (100 points), and the final oral report on the design and modeling project (100 points). The practical exams constitute 25% of each of the exam scores. You are encouraged to maintain a daily logbook of your software activities for the purposes of having a record of your work. An outline of the format for the written paper is presented below. The oral report must be presented using power point. A presentation should *sell* your work! Projection of relevant data, graphs, etc. can greatly enhance the effectiveness of your presentation....and it could help your grade as well!

Objectives:

Each student is expected to learn concepts and problem solving techniques in the areas of image processing, Geographic Information Systems (GIS), Fourier transform optics and image processing, modeling and analysis. Students must plan and carry out a project concerning the application of remote sensing, GIS, and/or GPS in an area of interest to his or her discipline. The project must be reported in a written paper and discussed in an oral presentation. Students are strongly encouraged to work on projects with a team approach, but there must be evidence of each student contributing to the project. Topics are selected based on available time, available image resources, and student interest. Project ideas must be approved by the faculty before you invest much time in researching the project.

This is an algebra and trigonometry based course in which students are expected to think in logical and quantitative ways. Exams will consist of relevant conceptual and problem solving questions.

Note that all material covered in the reading assignments will not be specifically discussed in the classroom. The reading assignments are, in part, to broaden your perspective of remote sensing and image processing applications. Some weekly assignments may be directed at your comprehension of the reading assignments.

Office Hours:

Brumfield – by appointment

Oberly – MWF 10:00 – 11:45, T 3:00 – 4:00, MW 2:00 – 3:30

Written paper format:

Title page

Abstract

Introduction with relevant citations in an acceptable form

Methods/Techniques/Data

Results/Discussion

Conclusion

Bibliography