SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON

COURSE OUTLINE

Course Title: INTRODUCTION TO IDRISI

Code No.: GIS 400   **Semester:**   1

Program: GIS SPECIALIST

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Date: OCT/98   **Previous Outline Date:** NEW

Approved: _K. DeLaronie_   _Oct. 09/98_

            Dean   **Date**

Total Credits: 4   **Prerequisite(s):** NONE

Length of Course: 3 hrs/wk x 16 wks   **Total Credit Hours:** 64

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I.   COURSE DESCRIPTION:

This course introduces the basic concepts of GIS, remote sensing and their application in decision-making. The course provides a combination of theoretical understanding and extensive practical exercises. Lab exercises will include modules from IDRISI for windows and its integrated ACCESS database.

II.   LEARNING OUTCOMES:

Upon successful completion of this course, the student will demonstrate the ability to:

1.   Review Course Outline and Perform Basic IDRISI Exercises.

     Potential elements of the performance:
     - Read over course outline with instructor
     - Navigate through the IDRISI environment
     - Use basic commands for navigation
     - Perform basic file management procedures
     - Use online help functions
     - Discuss cartography fundamentals
     - Develop basic database query procedures

2.   Perform GIS Analyses using IDRISI Functions.

     Potential elements of the performance:
     - Create images using palettes, symbols and scaling
     - Explain basic map algebra

3.   Develop Basic Applications Using Database Functions.

     Potential elements of the performance:
     - Create forward and backward linkages to ACCESS
     - Create images using database queries

4.   Develop Land Use Applications Using Distance and Context Operators.

     Potential elements of the performance:
     - Create buffer zones
     - Perform boundary operations
     - Develop thematic images

5.   Perform Automated Analyses Using Macros.

     Potential elements of the performance:
     - Create macros to automate repetitive tasks

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II.   LEARNING OUTCOMES *continued* . . .

Upon successful completion of this course, the student will demonstrate the ability to:

6.   Perform Economic Analysis using IDRISI Analysis Capabilities.

   Potential elements of the performance:
   - Estimate roadside to mill transportation costs using IDRISI cost-distance function
   - Estimate wood costs using IDRISI least-cost pathways function

7.   Explore Remotely- Sensed Imagery and Image Processing Techniques.

   Potential elements of the performance:
   - Explore ways to enhance images
   - Explain the logic behind image classification
   - Describe supervised and unsupervised classification methods
   - Explain the logic behind principal components analysis
   - Complete examples of both supervised and unsupervised classifications

8.   Explore Data Sources.

   Potential elements of the performance:
   - Identify digital cartographic databases
   - Develop methods for georeferencing unregistered images
   - Develop methods for changing reference systems

9.   Review and Summarize Course and Identify Future Directions.

   Potential elements of the performance:
   - Present project using computerized projection equipment
   - Write final exam

III.   TOPICS:

1.   Introduction and basic exercises
   - introduction to class – identify/query students' background, interest, GIS/computer skills and experience
   - overview/background to IDRISI; identify INTERNET web sites, reference materials
   - review course outline; establish consensus with respect to grading, testing and assignments
   - The IDRISI for Windows Environment
   - The Display System
   - Introduction to Cartographic Modeling
   - Database Query

Practical Assignment #1 – Display an Overlay

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III.   **TOPICS** *continued* . . .

2.   Analysis in GIS

- Map composition
- Palettes, Symbols and Scaling
- Map Algebra

Practical Assignment #2 – Prepare an overlay transformation

3.   Database Workshop

- Linking IDRISI images to Microsoft ACCESS
- Database query

Practical Assignment #3 – Create a display using a database query

4.   Distance and Context Operators

- Using distance operators (buffers, corridors)
- Using context operators (eg: slope constraints)

Practical Assignment #4 – Create a land use capability map.

5.   Automating Analyses with Macros

- Introduction to IDRISI macro language
- Running a macro
- Automating repetitive tasks

Practical Assignment #5 – Create a simple macro.
Project – Complete a Land Use Capability Assessment using IDRISI Analysis Tools.

6.   Economic Analysis

- Cost distance and least cost pathways

Practical Assignment #6 – Estimate Travel Times by Road Class Category

7.   Introduction to Image Processing

- Image Exploration
- Supervised Classification
- Principal Components Analysis
- Unsupervised Classification

Practical Assignment #7 – Complete a supervised classification

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III.   TOPICS *continued* . . .

8.   Data Import and Georeferencing

- Image Georegistration using RESAMPLE
- Digital Cartographic Databases
- Changing Reference Systems with PROJECT

Practical Assignment #8 – Register an image to a recognized co-ordinate system.

9.   Course Review and Summary

- Student project presentation
- Course review and future directions

FINAL THEORY EXAM

IV.   REQUIRED RESOURCES/TEXTS/MATERIALS:

Eastman, J.R. 1997. IDRISI for Windows, Student Manual System Basics, Version 2.0.
Worcester, Clark Labs for Cartographic Technology and Geographic Analysis. n.p.

ADDITIONAL RESOURCE MATERIAL

Eastman, J. R. 1997. IDRISI for Windows, Tutorial Exercises, Version 2.0. Worcester, Clark
Labs for Cartographic Technology and Geographic Analysis. n.p.

Eastman, J.R. 1997. IDRISI for Windows, User's Guide, Version 2.0. Worcester, Clark Labs for
Cartographic Technology and Geographic Analysis. n.p.

McKendry, J.E., J.R. Eastmen, K. St. Martin and M. A. Fulk. 1992. UNITAR Explorations in
Geographic Information Systems Technology- Vol. 2: Applications in Forestry. Geneva, United
Nations Institute for Training and Research. 157 pp.

Additional References to UNITAR Explorations in Geographic Information Systems Technology
Workbooks:

Applications in Coastal Zone Research & Management

GIS and Mountain Environments

Applications in Hazard Assessment and Management

IDRISI Advance Student Manual: Special Topics

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V.   EVALUATION PROCESS/GRADING SYSTEM:

Practical Assignments	25%
Project	15%
Quizzes and participation	15%
Final Theory Test	35%
Additional Optional Project(s)	10%
TOTAL	100%

NOTE: There will be a practical quiz at the start of each unit based on the previous unit's work.

GRADING: A+ = 85% and over consistently
A   = 75-84%
B   = 68-74%
C   = 60-67%
R   = less than 60%

NOTE: For an A+ grade the student will be expected to do additional projects as identified by the instructor.

VI.   SPECIAL NOTES:

Special Needs

If you are a student with special needs (eg. Physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717 or 491 so that support services can be arranged for you.

Plagiarism

Students should refer to the definition of "academic dishonesty" in the "Statement of Students Rights and Responsibilities."

Students who engage in "academic dishonesty" will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course, as may be decided by the professor.

In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Advanced Standing

Students who have completed an equivalent post-secondary course should bring relevant documents to the Coordinator, Natural Resources Programs.

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VI.   **SPECIAL NOTES** *continued* . . .

Retention of Course Outlines

It is the responsibility of the student to retain all course outlines for possible future use in gaining advanced standing at other post-secondary institutions.

Substitute course information is available at the Registrar's Office.

VII.   **PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion of the following