

INTRODUCTION TO ESRI SOFTWARE
COURSE NAME

GIS 402
CODE NO.

I. COURSE DESCRIPTION:

Introduction to ESRI Software (ArcView, ArcInfo, ArcCAD) ESRI is an industry standard for many of the basic GIS functions. Students completing this course will be able to perform the following functions; data capture, digitizing, scanning, data editing, topology building, attribute checks, data conversion, report generation and output plotting.

II. LEARNING OUTCOMES:

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

1. Demonstrate awareness of basic ARC/INFO features.

Potential elements of the performance:

- Navigate through the ARC/INFO environment
- Explain what coverage is
- Use basic commands for navigation
- Use online help functions

2. Demonstrate data capture methods.

Potential elements of the performance:

- Use ARC command to display, access and set the draw environment
- Prepare arms for automation
- Capture features from a map manuscript
- Visually evaluate the quality of the data capture
- Describe other methods of data capture
- Construct, assess and modify topology

3. Bring attribute data into ARC/INFO.

Potential elements of the performance:

- Create and modify INFO data
- Link data file to geographic data

4. Manage databases.

Potential elements of the performance:

- Register map to real world coordinates
- Describe map projections
- Match edges to adjacent coverages

5. Perform spatial analysis

Potential elements of the performance:

- Prepare data for analysis
- Create buffer zones
- Perform boundary operations
- Perform polygon overlay
- Manipulate tabular data

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II. LEARNING OUTCOMES *continued* . . .

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

6. Present the results of the spatial analysis.

Potential elements of the performance:

- Design the components of a map
- Use the symbols effectively
- Determine purpose of a map
- Define map parameters (size and scale)
- Design the map layout
- Create a final map product
- Generate a tabular report

7. Automate basic ARC/INFO tasks using ARC Macro Language(AML).

Potential elements of the performance:

- Run an AML
- Create pull-down menus
- Automate repetitive tasks

8. Bring data into ArcView and prepare and organize data for presentation.

Potential elements of the performance:

- Describe how ArcView is organized and compare with ARC/INFO
- Describe the components of ArcView
- Bring data into ArcView
- Classify themes
- Display themes
- Symbolize themes
- Measure distance and area in a View
- Manage scale
- Query data
- Select map features
- Select records in a table

9. Present GIS information in product form.

Potential elements of the performance:

- Create map layouts
- Add legends and other peripherals to a map
- Describe the chart and script components in ArcView.

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II. LEARNING OUTCOMES *continued* . . .

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

10. Describe the principles and applications used in ArCAD and perform simple tasks.

Potential elements of the performance:

- Describe principles of ArCAD
- Describe the ArCAD extension environment
- Describe extensions of ArCAD
- Perform simple tasks using ArCAD

III. TOPICS:

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|---|-------|
| 1. Introduction | 3 hrs |
| <ul style="list-style-type: none"> • course overview • getting used to ARC/INFO environment • the concept of coverages • testing the commands • using on-line help | |
| 2. Getting spatial data into ARC/INFO | 6 hrs |
| <ul style="list-style-type: none"> • setting up the draw environment • digitizing and entering tics • digitizing the arcs • digitizing label points | |

Practical Assignment: Digitize a portion of a stand map.

- Alternative data capture methods
- Constructing topology
- Identifying errors
- Correcting errors
- Reconstructing topology

PRACTICAL LAB TEST 1 2 hrs

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|---|-------|
| 3. Getting attribute data into ARC/INFO | 4 hrs |
| <ul style="list-style-type: none"> • Creation of data files • Entering descriptive attributes • Linking attributes to geographic data | |
| 4. Managing the database | 3 hrs |
| <ul style="list-style-type: none"> • Registering map to real world coordinates • Map projections • Edge mapping to two adjacent land use coverages | |

Practical Assignment: Create an INFO file given specific parameters.

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III. TOPICS *continued* . . .

5. Spatial Analysis 3 hrs
- Preparing data for analysis
 - Creating buffer zones
 - Using boundary operations
 - Performing polygon overlay
 - Manipulating tabular data

Practical Assignment: Given a coverage and associated database, analyze area for land use.

6. Creating a map 3 hrs
- Designing map components
 - Using symbols effectively
 - Determining purpose of a map
 - Defining the map parameters (size and scale)
 - Designing the map layout
 - Preparing symbol data
 - Creating a final map
 - Generating a tabular report
 - Plotting results

PRACTICAL LAB TEST 2 2 hrs

7. Introduction to ARC Macro Language (AML) 4 hrs
- Running an AML
 - Pull down menus
 - Automating repetitive tasks
8. Starting ArcView 3 hrs
- Comparing ARC/INFO and ArcView environments
 - Components of ArcView
 - Getting data into ArcView
 - Classifying and displaying themes
 - Symbolizing themes
9. Continuing with ArcView 3 hrs
- Measuring distance and area in a View
 - Managing scale
 - Querying data
 - Selecting map features in a View
 - Selecting records in a table

Practical Assignment: Prepare a map layout using ArcView.

10. Presenting GIS information 3 hrs
- Creating map layouts
 - Data summarization in table form
 - Adding legends and other peripherals
 - Charting and scripting applications

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III. TOPICS *continued* . . .

PRACTICAL LAB TEST 3 **2 hrs**

11. Introduction to ArCAD **3 hrs**
- Principles of AutoCAD
 - The ArCAD extension environment
 - Applications of ArCAD
 - Performing simple tasks

FINAL THEORY TEST **1 hr**

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

ESRI. 1997. Understanding GIS, The ARC/INFO Method. Version 7.1 for UNIX and Windows NT. Cambridge, Environmental Systems Research Institute, Inc. n.p.

ADDITIONAL RESOURCE MATERIAL

ESRI. 1997. Getting to Know ArcView GIS, the Geographic Information System (GIS) for Everyone. Cambridge, Environmental Research Systems Institute, Inc. n.p.

Heit, Michael, H.D. Parker and A. Shortreid.(Editors). 1996. GIS Applications in Natural resources 2.Fort Collins, GIS World Books. 540 pp.

Hutchinson, S. and L. Daniel. 1997, Inside ArcView GIS. Santa Fe, Onward Press. 474 pp.

Zeiler, Michael. 1997. Inside ARC/INFO. Updated for Windows nt, UNIX, and VMS Users. Santa Fe, Onward Press. 630 pp.

V. EVALUATION PROCESS/GRADING SYSTEM:

Practical Assignments	30%
Practical Lab Tests	50%
Final Theory Test	20%

GRADING:

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

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.

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VI. SPECIAL NOTES *continued* . . .

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.

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:

Please contact the Prior Learning Assessment Office (H2040) for further information.

