GIS IN LAND RESOURCE MANAGEMENT -- SOS 5720C

On-Campus Section

INSTRUCTOR:

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TIMES: Fall, even and odd years

CREDIT HOURS: 3

ENROLLMENT CAP: 20

FORMAT: Lecture and labs

Office Hours: Monday & Tuesday 9:30 to 10:30 am (office: McCarty Hall 2171)

DELIVERY MODE:

- Course material is provided via an Online Education Portal: http://swsde.ifas.ufl.edu (incl. annotated Power Point slides, reading material in pdf format; e-lectures, library of GIS video clips; quizzes, and hyperlinks)
- Virtual computer lab is used for GIS assignments and project: http://www.cals.ufl.edu/itservices/virtuallab.Students are not required to purchase GIS software. The virtual computer lab provides 24/7 access to the ArcGIS software package and spatial datasets that are used in the assignments. The project will be also conducted within the virtual computer lab.

PREREQUISITES:

Basic knowledge in Windows operating system and high-speed Internet access (e.g. DSL, cable modem, or satellite modem) and in geography, statistics, and soil science/land resources are expected.

COURSE OBJECTIVES:

To provide students with the basic concepts of, and experience in using, the ArcGIS geographic information system (GIS) and geospatial methods as applied to land resource management issues.

OTHER INFORMATION:

The course counts towards the ICGIS certificate (http://web.uflib.ufl.edu/icgis).

SOFTWARE:

In this course the ArcGIS Vers. 9.2 (Environmental Systems Research Institute, Redlands, CA) software is used including the components ArcCatalog, ArcMap, ArcToolbox and ArcEditor. The following extensions will be used: Spatial Analyst and Geostatistical Analyst. Other supporting software packages available in the virtual computer lab include: SGems, SPSSWIN, MS Office Suite-MS Word, Power Point, Excel and Access.

REQUIRED TEXTBOOK:

Bolstad P. 2008. GIS Fundamentals. Eider Press, White Bear Lake, Minnesota. ISBN 0-9717647-0-0.

RECOMMENDED FURTHER READING:

Price M. 2007. Mastering ArcGIS. McGraw Hill Publ., New York. ISBN 0-07-286543-1 (textbook includes a CD with video clips).

GRADING:

Assignments: 70% (total of 10 assignments; 7 (best) out of the 10 assignments will be considered for grading).

GIS Project: 20%

Development of Reusable Learning Object (RLO) on GIS topic: 5%

Overall course participation: 5% (participation in lectures and labs)

GRADING SCHEME:

A 90 - 100
B+ 85 - 90
B 80 - 85
C+ 75 - 80
C 70 - 75
D+ 65 - 70
D 60 - 65
E < 60

COURSE MODULES:

Module 1: Principles of Geographic Information Systems (GIS)

Introduction to the basic components and structure of GIS. Geographic concepts, geographical entities and spatial data formats will be introduced.

Module 2: Introduction to ArcGIS

Introduction to the ArcGIS software and its components (ArcMap, ArcCatalog and ArcToolbox). You will learn how to navigate, manage spatial data, manipulate layers, and document spatial data.

Module 3: Spatial Data Formats

In this module you will learn about data types, the differences between raster and vector formats, non-native data formats and metadata. Data analyses and functions are highly dependent on these spatial data formats.

Module 4: Map Projections

This module provides an overview of geographic coordinate systems and map projections. These are essential to georeference spatial data and superimpose spatial datasets.You will be introduced to a variety of commonly used map projections.

Module 5: Spatial Data Analysis

An overview of multiple vector-based and raster-based (local, focal, zonal and global) spatial operations will be provided. Queries, the field calculator, raster calculator and model maker provide operational tools to conduct spatial analyes within the ArcGIS environment. You will learn how to create new spatial datasets and how to edit existing spatial datasets.

Module 6: Database Concepts and Soil Information Systems

In this module you will learn about database management of spatial data. You will be introduced to multiple Soil Information Systems which use the relational database concept to store land resource data.

Module 7: Interpolations

You will learn how to interpolate point (site-specific) data using a variety of different methods (local, global, and geostatistical). These methods generate continuous maps that show gradual changes in soils and other environmental properties. Cross-validation, validation and error metrics are important to document the prediction quality of properties.

Module 8: Review Spatial and Spectral Domains

An overview of readily available geo-databases at global, national, regional and local scale will be provided.

Module 9: Standards, Data Quality and Errors

In this module you will learn about standards for spatial data and transfer of data, data quality such as precision, accuracy, bias and errors associated with GIS datasets.

Module 10: The Role of GIS in Land Resource Management

In this module you will learn how GIS can be utilized to support land resource management planning. Sustainable land resource management, multi-user, multi-functions, and multiple-stresses imposed on soil-landscapes will be given special attention.

Module 11: GIS Project Implementation

Learn how to implement a GIS project. Techniques such as flowcharts and bullet lists can help you structure a GIS project. Project planning occurs in stages from problem identification - formulation of goals and objectives - assembly of spatial datasets - spatial data analyses - results and interpretation - presentation and dissemination of results.

ACADEMIC HONESTY:

In fall 1995 the University of Florida student body enacted a new honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by the students: Preamble: In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. A student-run Honor Court and faculty support are crucial to the success of the honor code. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor Code: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Matters of violations of academic honesty are adjudicated by the Student Honor Court, the Health Center Student Conduct Standards Committee, the Student Conduct Committee, the College of Law Honor Committee and faculty.

See a current Undergraduate/Graduate Catalog for definitions of Plagiarism, Bribery, Misrepresentation, Conspiracy, and Fabrication.

UF COUNCELING SERVICES:

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. These resources include:
1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling;
2. SHCC Mental Health, Student Health Care Center, 392-1171, personal counseling;
3. Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling; and
4. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES:

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.

SOFTWARE USE:

All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.