NRM 87 Course Outline as of Fall 2019

CATALOG INFORMATION

Dept and Nbr: NRM 87 Title: GIS APPLIC IN NAT RESRC
Full Title: Geographic Info. Systems Applications in Natural Resources
Last Reviewed: 12/12/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
An introduction to the use of Geographic Information Systems (GIS) to analyze and interpret natural resources data, and to solve common conservation problems. Includes a basic introduction to ArcView GIS, analysis of habitat loss for endangered species, evaluation of mineral development impacts, watershed analysis, assessing data quality, and environmental analysis associated with timber management.

Prerequisites/Corequisites:

Recommended Preparation:
Course Eligibility for GIS 40

Limits on Enrollment:

Schedule of Classes Information:
Description: An introduction to the use of Geographic Information Systems (GIS) to analyze and interpret natural resources data, and to solve common conservation problems. Includes a basic introduction to ArcView GIS, analysis of habitat loss for endangered species, evaluation of mineral development impacts, watershed analysis, assessing data quality, and environmental

analysis associated with timber management. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Course Eligibility for GIS 40
Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Fall 2002	Inactive:	
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Use Geographic Information Systems (GIS) to analyze and interpret natural resources data.
2. Solve common conservation problems.
3. Analyze habitat loss for endangered species and stratify timber types using computer software.

Objectives:
At the conclusion of this course, the student should be able to:
1. Demonstrate the use of a basic GIS operating system.
2. Calculate acreages and analyze changes in wildland resources over time and space using GIS data.
3. Identify potential mining development sites from spatial data.
4. Classify soils based on their erosion potential.
5. Determine and discuss the effects of road density on competing watershed values.
6. Display a shaded relief map, and identify specific data values contained therein.
7. Define strand characteristics (age, density) that my benefit or be detrimental to various listed wildlife species.
8. Identify potential timber harvest units from aerial imagery, and prepare a data base.

Topics and Scope:

I. Introduction to Geographic Information Systems
   A. Basic terminology and computer operation
   B. Uses and objectives of spatial data systems
   C. Opening an ArcView project

D. ArcView documents and thematic planning
E. Identifying and selecting data features

II. Analysis of Habitat Loss for Endangered Species
A. Use symbology and labels to map animal recovery zones
B. Calculate and map species density for specific areas
C. Summarize and chart changes in wildlands

III. Evaluation of Mineral Potential and Development Impacts
A. Identification and labeling of protected areas
B. Use of proximity analysis in selecting mine site in relationship to distance from protected areas
C. Modification of mine location based on competing resource impacts

IV. Watershed Analysis
A. Use of spatial data to identify watershed boundaries
B. Determination of total road length and road density within watershed boundaries
C. Thematically analyze road networks that threaten stream habitats

V. Assessing Data Quality
A. Display and use of shaded relief images of topographic features
B. Display and use of spot images to verify mountain roads
C. Use of orthophotos to assess forest stand data

VI. Environmental Analysis of Proposed Timber Sale
A. Identification of stands with characteristics making them suitable harvest candidates (age, density, species composition)
B. Display and analysis of proposed timber sale units occurring on steep slopes
C. Display and analysis of timber sale units based on proximity to perennial and intermittent streams
D. Classification of timber sale units based on their environmental risk

Assignment:

1. Operate a GIS-based computer system using ArcView 1.0 through classroom demonstration
2. Read assignments totaling 25 pages per week from text
3. Classroom projects developing natural resources maps and flow charts based on spatial and temporal data using GIS
4. Classroom projects developing natural resource attribute tabular data from GIS database
5. Classroom project proposal to alter resource development plans based on environmentally limiting factors
6. Weekly quizzes
7. Midterm and final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Completion of a map and a flow chart, operate GIS-based computer system	Problem solving 30 - 50%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Classroom projects	Skill Demonstrations 40 - 60%

Exams: All forms of formal testing, other than skill performance exams.

Quizzes, midterm, final exam: Multiple choice, true/false, matching items, completion	Exams 5 - 10%

Other: Includes any assessment tools that do not logically fit into the above categories.

Project proposal	Other Category 5 - 20%

Representative Textbooks and Materials:

Land Resource Management Using Remote Sensing and GIS. Manickam, Lalitha. Lambert Academic Publishing. 2015
Geographic Information Systems and Environmental Modeling. Clarke, Keith and Parks, Bradley and Crane, Michael. Pearson. 2001 (classic)
Managing Natural Resources with GIS. Lang, Laura. Esri Press. 1998 (classic)