

1D 170-6
- 2 GE forms

NEW TOPIC PROPOSAL

also submitted as
GEOG 120 form
w/ GE forms

Note: The proposed topic below can only be offered two times.

Is GE credit being requested? Yes No
If so, which area(s)? D/D7

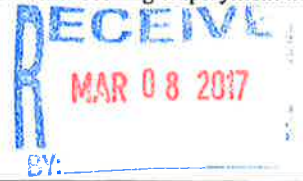
Please attach the GE form to this form for the area requested. **C-form also submitted as GEOG 120 with D and D7 forms.**

Please attach a section add form.

- 1. College of: CHABSS CoBA CoEHHS CSM
- 2. Center/Program/Department: LBST
- 3. Instructor Elizabeth Ridder
- 4. Topic Abbreviation and Number: ID 170-XX
- 5. Grading Method: Normal
- 6. Term: Summer
- 7. Year: 2017
- 8. Variable Units: * No
- 9. Has this topic been offered previously? Yes No If yes, indicate term(s) Year:
- 10. Topic Title: Introduction to Geographic Information Systems (GIS)
(Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.)
- 11. Abbreviated Title for PeopleSoft: (no more than 25 characters, including spaces)
ST: Intro to GIS
- 12. Topic Description: Note: This part can be skipped if answer to part 9 is "yes." Please provide detailed information about the topic. Please type. You may also attach the topic description on a separate sheet if you do not have enough space.
Introduces the basic principles and applications of Geographic Information Science (GIScience) and Geographic Information Systems (GISystems). Topics include cartographic basics, map projections, Global Positioning Systems, common spatial data models, database aspects, and spatial representation and visualization. Includes lab.
- 13. Does this topic have prerequisites? Yes No
- 14. Does this topic have co-requisites? Yes No
- 15. Does the topic require consent for enrollment? Yes No
 Faculty Credential Analyst Dean Program/Center/Department - Director/Chair
- 16. Is topic crosslisted Yes No If yes, indicate which course and obtain signature in #18.

17. Justification for offering this topic.
GIS is utilized in many courses across the CSUSM campus. At this time, there is not a course that introduces students to the software platforms utilized in these course (ArcGIS and ArcGIS online). This means that each instructor spends time teaching students how to navigate within the software and how to utilize the tools, taking time away from using the software as an investigative tool in their course and duplicating teaching effort. If students were entering their majors courses with knowledge of how to implement a project in GIS, they could use the tool as a method to investigate discipline-specific questions, particularly in their capstone or senior research courses.

The skills and techniques acquired in the course are transferrable across disciplines, thus supporting the campus-wide implementation of GIS in the curriculum. GIS skills are also transferable to many workplace contexts, increasing the competitiveness of students seeking employment in any field that requires spatial thinking and analysis.



* Enter units only if this is a variable-units topic course.

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18. Does this topic impact any other disciplines? Note: This number can be skipped if answer to part 9 is "yes." (If there is any uncertainty as to whether a particular discipline is affected, check "yes" and obtain signature.)

Yes No If yes, obtain signature(s). Any objections should be stated in writing and attached to this form.

Discipline _____ Signature _____ Date _____ Support _____ Oppose _____

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1. Elizabeth Ridder 20 February 2017
Originator (Please Print) Date

2. Kim K. Yung 2/20/17
Program/Center/Department - Director/Chair Date

3. [Signature] 3/7/17
College Curriculum Comm. Rep. Date

4. [Signature] 3/7/17
Dean of College (or Designee) Date

5. [Signature] 3/14/17
Associate VP Academic Programs Date

RP
Tracker ✓

GEOG 120: Introduction to Geographic Information Systems (GIS)

Official Course Description

Introduces the basic principles and applications of Geographic Information Science (GIScience) and Geographic Information Systems (GISystems). Topics include cartographic basics, map projections, Global Positioning Systems, common spatial data models, database aspects, and spatial representation and visualization. Includes lab.

Student Learning Outcomes

Course Learning Outcomes

Upon completion of the course, students will be able to

1. Explain how geographic features are represented with computers.
2. Identify the strengths, weaknesses, and assumptions of the tools within a GIS.
3. Select, apply, and explain the use of GIS tools in their appropriate contexts.
4. Demonstrate common techniques for capturing geographic features in digital form.
5. Locate, import, manipulate, and display geographic information in a GIS.

University GE Program Student Learning Outcomes

Students will also be able to:

1. Communicate effectively in writing to various audiences.
2. Think critically and analytically about an issue, idea, or problem.
3. Find, evaluate, and use information appropriate to the course and discipline.

Required Materials and Technology

Text: Bolstad, Paul, 2016, *GIS Fundamentals: A First Text on Geographic Information Systems*, 5th Ed., XanEdu Publishing, Inc., 770 pages. ISBN-13: 978-1506695877.

Technology: Every student must have regular access to a computer with a reliable (and preferably fast) internet connection. All course materials will be posted through Cougar Courses. Applied coursework requires the use of ArcGIS, available through CougarApps.

Course Outline

Week	Lecture Topics	Lab	Reading	Course SLOs	GE LOs
1	What are GIScience and GISystems? History of discipline and software systems Data Models Raster data model	Intro to ArcMap & ArcGIS Online • Create your ESRI account	Chapters 1, 2	1, 2, 4, 5	1, 2

		<ul style="list-style-type: none"> • Navigating in ArcMap & ArcGIS Online • Where to find help (help tool/icon & ESRI online help) • Setting the work environment • Navigating file structure (Where are my projects/layers saved?) • Importing data 			
2	<p>Data Models</p> <p>Vector data model</p>	<p>Intro to ArcCatalog</p> <ul style="list-style-type: none"> • How to find ArcCatalog • Why use? • Editing file names & locations in ArcCatalog • What do the different symbols tell me about the files/data type? • How is ArcGIS file structure different than ArcGIS Online? 	Chapter 2	1, 2, 4, 5	1, 2
3	<p>Map projections & coordinate systems</p> <p>How do we measure and construct models of the Earth?</p> <p>Geodesy</p> <p>Coordinate systems</p>	<p>Creating a geodatabase</p> <p>Digitizing</p> <ul style="list-style-type: none"> • Creating shapefiles • Importance of scale • Converting hard copy features into digital features in vector format (digitizing) • Editing vector features 	Chapter 3	1, 2, 3, 4, 5	1, 2, 3
4	<p>Map projections & coordinate systems</p> <p>How do we measure and construct models of the Earth?</p> <p>Map projections</p>	<p>Projections</p> <ul style="list-style-type: none"> • Setting projected coordinate systems • Converting between coordinate systems • Influence of coordinate system on location coordinates 	Chapter 3	1, 2, 3, 4, 5	1, 2, 3

		<ul style="list-style-type: none"> • Influence of projection on map interpretation • Data management and projection <ul style="list-style-type: none"> • Projection • Units of measure • Zone (UTM) • FIPS (State Plane) • Datum 			
5	<p>Map projections & coordinate systems</p> <p>How do we measure and construct models of the Earth?</p> <p>Primary and secondary data</p>	<p>Geocoding</p> <ul style="list-style-type: none"> • Editing data • Shapefiles and tables • Adding coordinate data • Postal data and coordinate data • Resolution issues • Geocoding services • Data management 	Chapters 3, 7	1, 2, 3, 4, 5	1, 2, 3
6	<p>Map projections & coordinate systems</p> <p>How do we measure and construct models of the Earth?</p> <p>Introduction to Global Positioning Systems (GPS)</p>	<p>GPS</p> <ul style="list-style-type: none"> • Types of GPS receivers • Device set-up • Field data collection • Importing into GIS and creating shapefiles • Data editing and management in GIS 	Chapter 5	1, 2, 3, 4, 5	1, 2, 3
7	<p>Basic Cartography</p> <p>Map design basics</p>	<p>Thematic mapping</p> <ul style="list-style-type: none"> • Data characteristics • Selecting appropriate thematic map • Data display <ul style="list-style-type: none"> • Classification • Areal units • Color ramps • Symbology • Page layout and basic map requirements 	Chapter 4	1, 2, 3, 4, 5	1, 2, 3

8	Map types & thematic mapping Choropleth maps Color theory & special data considerations	Georectifying	Chapter 4	1, 2, 3, 4, 5	1, 2, 3
9	Intro to databases and use in GISystems Data quality & standards Exam 1	Selection tools <ul style="list-style-type: none"> • Select by feature Data management <ul style="list-style-type: none"> • Temporal, positional, and attribute accuracy 	Chapters 14	1, 2, 3, 4, 5	1, 2, 3
10	Intro to databases and use in GISystems Relational databases Spatial queries and joins	Working with tables & queries <ul style="list-style-type: none"> • Attribute table components • Joins and Relates • How to select attributes through attribute table • Structuring a query 	Chapter 8	1, 2, 3, 4, 5	1, 2, 3
11	Intro to Remote Sensing Types of imagery Data sources	Open Lab for individual project	Chapters 6, 7	1, 2, 3, 4, 5	1, 2, 3
12	Intro to Remote Sensing Raster Analysis	Open Lab for individual project	Chapter 6	1, 2, 3, 4, 5	1, 2, 3
13	Intro to Remote Sensing Digital Elevation Models (DEMs) Terrain analysis Watersheds & viewsheds	Raster analysis <ul style="list-style-type: none"> • Exploring raster data and raster attributes • Resolution • Data types and sources • Map algebra • Raster vs vector data 	Chapters 10, 11	1, 2, 3, 4, 5	1, 2, 3
14	Intro to Spatial Analysis Spatial selection Raster & vector overlay	Geoprocessing <ul style="list-style-type: none"> • Merging layers • Dissolves • Clips • Buffers • Overlays Interpolation	Chapters 9, 10	1, 2, 3, 4, 5	1, 2, 3
15	Other GISs Web-based GISystems Data mining	Final Project presentations	Chapter 15	1, 2, 3, 4, 5	1, 2, 3

	Other GISystem software platforms				
16	FINAL EXAM (finals week)				

Course Requirements and Graded Components

Exams (2)	50% (25% each)
Lab Exercises	40%
Final Project	10%

All-University Writing Requirement

In this class, the All-University Writing Requirement is met through the submission of lab exercises and a final project. Both exams include questions that require analytic writing in response. Together, these requirements will meet or exceed the 2500-word minimum.

Credit hour policy

For each semester hour of credit that assigned to a Geography course, you should expect to spend minimum of **two** hours per week for each unit of credit, outside the classroom preparing for class sessions. *In this course, this means you should plan for a minimum of eight hours per week outside of class time in preparation.*