

<b>ORIGINATOR'S SECTION:</b>														
<b>1. College:</b> <input checked="" type="checkbox"/> CHABSS <input type="checkbox"/> CoBA <input type="checkbox"/> CoEIHHS <input type="checkbox"/> CSM	<b>Desired Term and Year of Implementation (e.g., Fall 2008):</b>  Spring 2018													
<b>2. Course is to be considered for G.E.? (If yes, also fill out appropriate GE form*)</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No														
<b>3. Course will be a variable-topics (generic) course?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No ("generic" is a placeholder for topics)														
<b>4. Course abbreviation and Number:*</b> <b>GEOG 120</b>														
<b>5. Title: (Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.)</b> <b>Introduction to Geographic Information Systems (GIS)</b>														
<b>6. Abbreviated Title for PeopleSoft:</b> (no more than 25 characters, including spaces) Intro to GIS														
<b>7. Number of Units:</b> 4														
<b>8. Catalog Description: (Not to exceed 80 words; language should conform to catalog copy. Please consult the catalog for models of style and format; include all necessary information regarding consent for enrollment, pre- and/or corequisites, repeated enrollment, crosslisting, as detailed below. Such information does <u>not</u> count toward the 80-word limit.)</b>  Introduces students to 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.														
<b>9. Why is this course being proposed?</b>  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.  The course will be required of all B.A. Geography majors, upon approval of the Geography program.														
<b>10. Mode of Instruction*</b> For definitions of the Course Classification Numbers: <a href="http://www.csusm.edu/academic_programs/curriculum/schedule/catalog/curricula/DOCUMENTS/Curricular_Forms_Tab/Instructional%20Mode%20Conventions.pdf">http://www.csusm.edu/academic_programs/curriculum/schedule/catalog/curricula/DOCUMENTS/Curricular_Forms_Tab/Instructional%20Mode%20Conventions.pdf</a>														
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;">Type of Instruction</th> <th style="width:20%;">Number of Credit Units</th> <th style="width:50%;">Instructional Mode (Course Classification Number)</th> </tr> </thead> <tbody> <tr> <td>Lecture</td> <td style="text-align: center;">3</td> <td>C2</td> </tr> <tr> <td>Activity</td> <td></td> <td></td> </tr> <tr> <td>Lab</td> <td style="text-align: center;">1</td> <td>C16</td> </tr> </tbody> </table>			Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)	Lecture	3	C2	Activity			Lab	1	C16
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Lecture	3	C2												
Activity														
Lab	1	C16												
<b>11. Grading Method:*</b> <input checked="" type="checkbox"/> Normal (N) (Allows Letter Grade +/-, and Credit/No Credit) <input type="checkbox"/> Normal Plus Report-in-Progress (NP) (Allows Letter Grade +/-, Credit/No Credit, and Report-in-Progress) <input type="checkbox"/> Credit/No Credit Only (C) <input type="checkbox"/> Credit/No Credit or Report-in-Progress Only (C1)														
<b>12. If the (NP) or (CP) grading system was selected, please explain the need for this grade option.</b>														
<b>13. Course Requires Consent for Enrollment?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No														

\* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair

Faculty  Credential Analyst  Dean  Program/Department - Director/Chair

14. Course Can be Taken for Credit More than Once?  Yes  No  
 If yes, how many times? (including first offering)

15. Is Course Crosslisted:  Yes  No  
 If yes, indicate which course and check "yes" in item #22 below.

16. Prerequisite(s):  Yes  No

17. Corequisite(s):  Yes  No

18. Documentation attached:  Syllabus  Detailed Course Outline

19. If this course has been offered as a topic, please enter topic abbreviation, number, and suffix:\*

20. How often will this course be offered once established?\* At least once per year.

**PROGRAM DIRECTOR/CHAIR - COLLEGE CURRICULUM COMMITTEE SECTION:**  
 (Mandatory information - all items in this section must be completed.)

21. Does this course fulfill a requirement for any major (i.e., core course or elective for a major, majors in other departments, minors in other departments)?  Yes  No  
 If yes, please specify: This course is required for the proposed Geography B.A.

22. Does this course impact other discipline(s)? (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
Discipline	Signature	Date	Support	Oppose

**SIGNATURES : (COLLEGE LEVEL) :**

Elizabeth Ridder 30 JAN 2017  
 1. Originator (please print or type name) Date

Kim [Signature] 1/27/17  
 2. Program Director/Chair Date

[Signature] 2/22/17  
 3. College Curriculum Committee Date

Mary [Signature] 2/22/17  
 4. College Dean (or Designee) Date

**(UNIVERSITY LEVEL)**

5. UCC Committee Chair Date

6. Vice President for Academic Affairs (or Designee) Date

7. President (or Designee) Date

\* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair

## **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*, 5<sup>th</sup> 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**

<b>Week</b>	<b>Lecture Topics</b>	<b>Lab</b>	<b>Reading</b>	<b>Course SLOs</b>	<b>GE LOs</b>
<b>1</b>	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"> <li>• Navigating in ArcMap &amp; ArcGIS Online</li> <li>• Where to find help (help tool/icon &amp; ESRI online help)</li> <li>• Setting the work environment</li> <li>• Navigating file structure (Where are my projects/layers saved?)</li> <li>• Importing data</li> </ul>			
2	<p>Data Models</p> <p>Vector data model</p>	<p>Intro to ArcCatalog</p> <ul style="list-style-type: none"> <li>• How to find ArcCatalog</li> <li>• Why use?</li> <li>• Editing file names &amp; locations in ArcCatalog</li> <li>• What do the different symbols tell me about the files/data type?</li> <li>• How is ArcGIS file structure different than ArcGIS Online?</li> </ul>	Chapter 2	1, 2, 4, 5	1, 2
3	<p>Map projections &amp; 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"> <li>• Creating shapefiles</li> <li>• Importance of scale</li> <li>• Converting hard copy features into digital features in vector format (digitizing)</li> <li>• Editing vector features</li> </ul>	Chapter 3	1, 2, 3, 4, 5	1, 2, 3
4	<p>Map projections &amp; 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"> <li>• Setting projected coordinate systems</li> <li>• Converting between coordinate systems</li> <li>• Influence of coordinate system on location coordinates</li> </ul>	Chapter 3	1, 2, 3, 4, 5	1, 2, 3

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

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