GEOG 150: MAP INTERPRETATION AND ANALYSIS

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2021
Credits:	3
Total Contact Hours:	54
Lecture Hours :	54
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	108
Strongly Recommended:	ENGL 101 or ENGL 101E or ENGL 101H.
District General Education:	C2. Humanities
Transferable to CSU:	Yes
Transferable to UC:	No
Grading Method:	Standard Letter, Pass/No Pass

Catalog Course Description

Introduction to maps, imagery and geographic techniques. Technologies include map and aerial photograph interpretation, tabular data, spatial statistics, cartography, Global Positioning Systems (GPS), Internet mapping, remote sensing and Geographic Information Systems (GIS) that aid in data collection, analysis and presentation. 54 lecture hours.

Course Objectives

- Describe the major modes of geographic inquiry
- Demonstrate an understanding of mapping concepts and the ability to interpret maps and mapped data.
- Describe geographic technologies and their use in collecting, analyzing and displaying geospatial data.
- Demonstrate the ability to use geographic technologies in collecting, analyzing and displaying geospatial data.
- Interpret displays of tabular data in spatial visualizations.

Major Course Content

1. Introduction to Map Interpretation and Spatial Analysis
   a. The scientific method as applied to spatial analysis
   b. Data (types, collection methods and potential for misuse)
   c. Importance of maps for communication and decision-making purposes
2. Foundations in Maps, Survey, and Cartography
   a. Types and uses of various maps
   b. Map scale and contour lines
   c. Direction and distance
   d. Coordinate systems
   e. Map projections
3. Survey of Mapping Technologies
   a. Current Internet-based mapping applications
   b. Global Positioning Systems (GPS)
   c. Remote sensing data collection and processing
   d. Geographic Information Systems (GIS)
   e. Light Detection and Ranging (Lidar)
   f. Unmanned Aerial Systems (UAVs)
4. Traditional Data Collection, Processing and Analysis
   a. Tabular recording of field-generated data
   b. Basic statistical analysis
   c. Display tools for numeric data
5. Geospatial Data Collection, Processing and Analysis
   a. GPS technology and field application
   b. Collection, creation and analysis of spatial data in a GIS
   c. Aerial imagery interpretation
   d. Basic cartography and display of data

Suggested Reading Other Than Required Textbook

Cheng, Eric. Aerial Photography and Videography Using Drones. PeachPit Press. 2016

Examples of Required Writing Assignments

Topographic map analysis assignment
In this assignment, students analyze and interpret a USGS topographic map and must perform research to describe, analyze, and interpret the physical and cultural features of a single USGS topographic map that they choose.
Students will complete an essay researching the topographic maps of their choosing. Students must write 3-5 pages, 12 font, double spaced with 5 minimum outside sources with work cited page. Students must answer the questions using the textbook and outside sources and follow the guidelines. First, students describe, analyze, and interpret the physical and cultural features of a single topographic map that you choose and use at least two outside sources to define and describe the terminology.

Paragraph 1: Describe the topographic profile, terrain and landscape features featured on the map using at least 2 outside sources to define and describe terminology including map scale, contour lines and contour interval.

Paragraph 2: Analyze, and interpret the physical geologic features of the topographic map. Describe historic and modern geologic activity that occurs within the map region.

Paragraph 3: Analyze, and interpret the cultural features of the topographic map. Describe what features are present and what features are absent or out of date. Research the origin of the map data, creation date of the map and remote sensing data used to create it. Describe limitations and strengths of the map and its features.

Paragraph 4: State and defend an argument for the use of your topographic map as either a reliable or unreliable tool to understand and interpret the region. Use at least two sources to defend your argument.

Essay will include a rubric that evaluates the essay on the following criteria: 1st- Does the essay meet the requirements of length, citations etc and is clear, concise and addresses the essay prompt accuracy? 2nd-

Was each paragraph complete and answered the question required in detail using sources? 3rd- Did the student fully research and explain the answer for each paragraph and did each paragraph include accurate examples and appropriate terminology related to the topic? 4th- Did the student defend an argument for the use of their topographic map with researched sources?

Examples of Outside Assignments

Autonomous Data Collection Assignment
In this assignment, students will learn about modern remote sensing tools and the use and application of unmanned aerial vehicles (UAVs/"drones") to measure and take photographs. Using their own phone along with a free program from Ryze, students will learn how to program the drone to complete autonomous missions using a second free online software program from DroneBlocks and then plan and perform an autonomous mission on their own using the drone and the classroom. Students will have several class sessions to learn how to fly the drone, class sessions to measure out their mission and more to perform the flights and be evaluated for grade.
Create a program flight using the free software DRONEBLOCKS for the Ryze Tello drone http://amaflightschool.org/diy/droneblocks https://learn.droneblocks.io/p/introduction-to-tello-edu-drone-programming-with-droneblocks https://learn.droneblocks.io/p/droneblocks-curriculum-4th-8th-grade Students will use a free online programming software to plan out and program a flight on the Ryze Tello drone. Each student will create a program and then allow the Tello to perform its mission. Assignment begins with students watching a video to prepare themselves for the project https://youtu.be/ugCQ1f5ICYg
Next, students will have practice with the Ryze Tello drone to learn how to fly and control the drone using their phones https://www.ryzerobotics.com/tello
Students next download DRONEBLOCKS Program and learn how to program a mission for the Ryze Tello drone https://www.droneblocks.io/ Students must follow the required mission produces: 1st- Measure a section of the classroom out and write down the distances from doors, walls and desks to plan out there flight mission. All distances for the mission must be known and must be in units of centimeters and meters including elevation changes 2nd- Using the DRONEBLOCKS website/Phone application, prepare a flight mission that will have the Tello drone performing at least: 3 Flips, 5-20 right turns, 5-20 left turns, 1 high speed section of at least 10 feet, elevation rise of 3 feet, 2 landings/take-offs and 1 circle around an object. Drone must start in a pre-determined location and complete its pre- programed mission and return to original location to receive full assignment credit
Students will use the Ryze Tello Drone in class in an hands-on activity and be evaluated based on the following criteria in the assignment rubric: 1st- Did the students successful plan and control the drone? 2nd- Was the flight plan accurate and performed the required tasks accurately? 3rd- Did the students have control over the drone or was there a crash? 4th- Did the student correctly use the software, plan out the mission with measurements or where there issues with lengths or locations that prevented the drone from completing the mission? 5th- Did drone perform the required flips, elevation changes and distances correctly and without assistance from student during the mission?

Instruction Type(s)

Lecture, Online Education Lecture

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

No

IGETC Area 6: Languages other than English

No