California State University San Marcos   • NEW COURSE •   FORM C   **GEOG 433**

ORIGINATOR'S SECTION:

1. College:	**Desired Term and Year of Implementation (e.g., Fall 2008):**	
☒CHABBS ☐ CoBA ☐ CoE	Fall 2017	

2. Course is to be considered for G.E.? (If yes, also fill out appropriate GE form*)   ☐ Yes ☒ No

3. Course will be a variable-topics (generic) course? ☐ Yes ☒ No
("generic" is a placeholder for topics)

4. Course abbreviation and Number:* GEOG 433

5. Title: *(Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.)*
Programming in GIS

6. Abbreviated Title for Banner:
(no more than 25 characters, including spaces)
Programming in GIS

7. Number of Units: 3 units

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 not count toward the 80-word limit.)*

Programming languages are essential tools used in Geographic Information Systems and Spatial Data Analysis. In this course, students learn which languages are used in GIS applications and develop their own skills through a series of lab exercises. The languages covered include the multipurpose coding language, Python, and the open source statistical language R. Students use these languages to complete a WebGIS project. *see attached updated description*

9. Why is this course being proposed?

This course is being proposed as part of GIS Certificate in Extended Learning. Programming skills are an essential and increasingly important part of the GIS professional's skills.

10. Mode of Instruction*
(See pages 19-23 at
https://zeta.calstate.edu:8250/webdoc/TransactionDEDS
ection5.doc for definitions of the Course Classification
Numbers)

Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)
Lecture	3	C-2
Activity		
Lab		

11. Grading Method:*
☒ Normal (N) *(Allows Letter Grade +/-, and Credit/No Credit)*
☐ Normal Plus Report-in-Progress (NP) *(Allows Letter Grade +/-, Credit/No Credit, and Report-in-Progress)*
☐ Credit/No Credit Only (C)
☐ Credit/No Credit or Report-in-Progress Only (CP)

12. If the (NP) or (CP) grading system was selected, please explain the need for this grade option.

13. Course Requires Consent for Enrollment? ☐ Yes ☒ No

☐ 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   GEOG 335 or equivalent

17. Corequisite(s): ☐ Yes ☒ No

Catalog description GEOG 433:

Presents essential programming languages that are used in Geographic Information Systems and Spatial Data Analysis and develops skills through a series of lab exercises. Covers the multipurpose coding language, Python, and the open source statistical language R. Prerequisite: GEOG 335 or equivalent

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?* once per year through extended learning

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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: GIS Certificate

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 _____

_____   _____   _____Support _____Oppose
Signature   Date

Discipline _____

_____   _____   _____Support _____Oppose
Signature   Date

SIGNATURES : (COLLEGE LEVEL) :

Greig Guthey   March 10, 2017
1. Originator   (please print or type name)   Date

2. Program Director/Chair   3/4/17   Date

3. College Curriculum Committee   4/27/17   Date

4. College Dean (or Designee)   4/27/17   Date

(UNIVERSITY LEVEL)

_____   _____
5. UCC Committee Chair   Date

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

_____   _____
7. President (or Designee)   Date

Tracker ___
PS ___
RF ___

GEOG 433	Programming in GIS	3 Units

Instructor: TBD
Phone: TBD
Email: TBD

Course Description:

Programming languages are essential tools used in Geographic Information Systems and Spatial Data Analysis. In this course, students learn which languages are used in GIS applications and develop their own skills through a series of lab exercises. The languages covered include the multipurpose coding language, Python, and the open source statistical language R. Students use these languages to complete a WebGIS project.

Student Learning Outcomes: At the end of this course, students should

- _____Understand_____ programming in GIS and applications
- use Python to run and automate processes in ArcGIS.
- ꞮΙ use R to conduct spatial analysis and other tasks.
- use WebGIS and applications in a project

Required Texts:
Readings will be mostly available online through cougar courses and consist of online articles

Required Work:

1) Lab exercises (50% of grade)
2) Project Proposal (10% of grade)
3) Presentation (25% of grade)
4) Write-up (15% of grade)

Project examples include a web-based interactive map, data mining and data visualization, or a statistical analysis of spatial data. Write up is due the last day of class.

Course Process:

This 8-week course will feature lectures, labs, and project work. It meets twice per week for three hours each time. Each session will be divided between lectures, labs and/or project work.

Course Policies:

ACADEMIC HONESTY AND INTEGRITY:
Plagiarism includes: (a) quoting another person's actual words or copying a web page verbatim without acknowledgement; (b) paraphrasing another person's words without acknowledgement; (c) using another person's idea, opinion, or theory without acknowledgement; or (d) borrowing of facts, statistics, or other material, unless the information is common knowledge, or (e) copying from another person's exams, homework, quizzes, etc. Consequences will include failing the assignment and/or failing the course at the instructor's discretion. Additional consequences may include, extra work, probation, suspension, or expulsion.

ADA:
Students authorized by the Office of Disabled Student Services (DSS) to receive reasonable accommodations should meet with the instructor during office hours in order to ensure confidentiality. Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to DSS. This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909.

ALL UNIVERSITY WRITING REQUIREMENT:
The All-University Writing Requirement is met through a combination of lab exercises and a final project.

COLLEGIALITY:
I encourage you to participate. Please raise your hand if you have a question/comment; and please listen closely to what your classmates say. In this class, we learn in relation to each other, collectively and thus benefit from each other's input. So ask questions, challenge your classmates, debate and express your own take on course material, but do it respectfully and maturely. I will moderate all discussions in a fair and equal manner. Let's work together to foster an environment of open inquiry, critical thought, civil discourse and mutual understanding.

PHONES IN CLASS
If you need to make a call, answer or send a text for some reason, please step outside of class so you do not distract other students or the instructor.

GRADING:
This course uses a 100 point system weighted as indicated to calculate your final grade. If you have questions, the instructor is always happy to discuss student progress. Grades are assigned as follows:

A=>93; A-=90-92; B+=88-89; B=83-87; B-=80-82; C+=78-79; C=73-77; C-=70-72; D+=68-69; D=63-37; D-=60-62; F= All grades less than 60.

LATE WORK:
Should there be late work, acceptance will be at the instructor's discretion.

OTHER ISSUES:
Any other special needs/questions/situations should be directed to the instructor the first week of class or as soon as possible.

Course Outline

Week 1: Introduction to the Course, The Software (R, Python, etc), & Programming in GIS.
Week 2: Scripts, Modeling, Data Variables, Objects and Data Structures
Week 3: Control Statements, Procedures and Functions
Week 4: Objects, Classes, and Methods, Data Acquisition and Processing
Week 5: Python in ArcGIS, Defining Problems and Proposal Writing: Proposal due: week 6

Week 6: Geoprocessing Data in Python and R, Spatial Analysis in R
Week 7: Spatial Databases and Python, Automation and batch processing.
Week 8: Student Presentations on their web-based project & Conclusion. Hand in write up.

Credit Hour Policy:

Students are expected to spend a minimum of two hours outside of the classroom each week for each unit of credit engaged in learning.