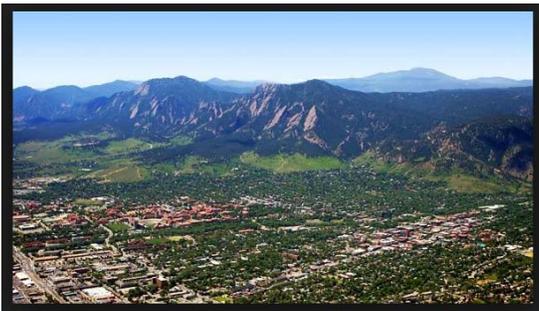


Undergraduate Certificate in GIS and Computational Science



OVERVIEW

Geographic Information Scientists (GIScientists) have an ongoing concern with the collection, analysis and display of high precision spatial data. The Department of Geography (GEOG) and the Department of Computer Science (CSCI) are offering a joint undergraduate certificate in GIS and Computational Science. The program draws upon faculty expertise in both departments, providing interdisciplinary training in spatial data analysis and computation, both of which characterize GIS in most career paths. Computational geospatial skills are in high demand on campus and in local, regional and national job markets such as government employment, industry or consulting careers, and graduate school. This certificate will be available to GEOG majors, to students enrolled in the Bachelor of Arts in CSCI program managed through the College of Arts & Sciences, and to students in other earth science disciplines (e.g., GEOL, ENVS, ENVD, EBIO, ANTH) and social science disciplines (e.g., PSCI, ECON, SOCY).

DETAILS

Certificate Intent:

The undergraduate certificate in GIS and Computational Science will teach students to identify, analyze and understand spatial patterns, with an emphasis on computation and analytical problem solving. Required coursework in GIS, basic statistics, and basic programming, coupled with advanced electives in GIScience will give students the computational knowledge and skills to tackle society's important and pressing environmental problems. The interdisciplinary nature of the certificate introduces students to the special characteristics (scale dependence, spatial autocorrelation) that complicate spatial data analysis, and offers additional programming skills relative to the basic GIS concentration. The computational emphasis will also increase students' competitive edge in the job market and when applying to graduate school. Upon completion of the required courses, students receive a signed certificate from the Geography and Computer Science Departments.

Program Requirements

Students must apply to and be accepted into the certificate program. Students must earn a C or better in all coursework in the certificate, and may not take certificate courses Pass/Fail. The certificate requires 18-20 hours of coursework, including required courses and electives (but not including prerequisites). Core courses are offered

each semester and Geography electives are offered at least once per year. If a student has fulfilled the Introductory Statistics requirement through AP coursework in high school, he or she would be eligible to take an additional elective. Students undertaking the Certificate as well as a GEOG minor must take at least 6-9 credits outside of GEOG GIS classes to satisfy the minor.

Prerequisites for admission into the certificate program (8 credits; can be met by completing AP coursework in high school)

CSCI 1300 Computer Science 1: Programming (4 credits)

GEOG 3023 Statistics for Geography (or equivalent course w/ spatial statistics focus)(4 credits)

Required core courses (11-12 credits):

CSCI 2270 Computer Science 2: Data Structures (prereq CSCI 1300 and Calculus) (4 credits)

GEOG 4103 Introduction to Geographic Information Science (prereqs GEOG 3023 and 3053) (4 credits)

AND EITHER

GEOG 3053 Cartography Visualization & Information Design (may be concurrent w/ GEOG 3023) (4 credits)

OR

GEOG 4603 GIS for Social and Natural Sciences (taught summer semester annually) (3 credits) (or GEOG 4110 if subtopic is same)

Two or more GIS electives to reach 18-20 credit hours from the following list:

GEOG 4203 GIS Modeling Applications (4 credits)

GEOG 4303 Spatial Programming in GIScience (4 credits)

GEOG 4403 Space-Time Analytics (3 credits) (or GEOG4100 if subtopic is Spatiotemporal Analysis)

GEOG 4503 GIS Project Management (3 credits) (or GEOG4100 if subtopic is same)

GEOL 3050 GIS for Geologists (2 credits)

OR

One or two upper division GIS-based courses in another A&S department (syllabi to be approved beforehand by certificate oversight faculty committee) (2-4 credits apiece)

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