

Institution Submitting Request: *University of Utah*

Proposed Title: *BS/MS Combined Program in Geographic Information Science*

Currently Approved Title: *N/A*

School or Division or Location: *College of Social and Behavioral Sciences*

Department(s) or Area(s) Location: *Department of Geography*

Recommended Classification of Instructional Programs (CIP) Code (for new programs):

Current Classification of Instructional Programs (CIP) Code (for existing programs): *45.0702*

Proposed Beginning Date (for new programs):

Institutional Board of Trustees' Approval Date:

Proposal Type (check all that apply):

Regents' General Consent Calendar Items		
<i>R401-5 OCHE Review and Recommendation; Approval on General Consent Calendar</i>		
SECTION NO.		ITEM
5.1.1	<input type="checkbox"/>	Minor*
5.1.2	<input type="checkbox"/>	Emphasis*
5.2.1	<input type="checkbox"/>	Certificate of Proficiency*
5.2.3	<input type="checkbox"/>	Graduate Certificate*
5.4.1	<input type="checkbox"/>	New Administrative Unit
	<input type="checkbox"/>	Administrative Unit Transfer
	<input type="checkbox"/>	Administrative Unit Restructure
	<input type="checkbox"/>	Administrative Unit Consolidation
5.4.2	<input type="checkbox"/>	New Center
	<input type="checkbox"/>	New Institute
	<input type="checkbox"/>	New Bureau
5.5.1	<input type="checkbox"/>	Out-of-Service Area Delivery of Programs
5.5.2	<input type="checkbox"/>	Program Transfer
	<input type="checkbox"/>	Program Restructure
	<input type="checkbox"/>	Program Consolidation
5.5.3	<input type="checkbox"/>	Name Change of Existing Programs
5.5.4	<input type="checkbox"/>	Program Discontinuation
	<input type="checkbox"/>	Program Suspension
5.5.5	<input type="checkbox"/>	Reinstatement of Previously Suspended Program
	<input type="checkbox"/>	Reinstatement of Previously Suspended Administrative Unit

**Requires "Section V: Program Curriculum" of Abbreviated Template*

Chief Academic Officer (or Designee) Signature:

I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

Signature

Date:

Department of Geography
Combined B.S./M.S. Geographic Information Science Program

Section I: Request

The Department of Geography in the College of Social and Behavioral Science at the University of Utah requests permission to establish a combined BS/MSGIS degree program in Geographic Information Science. The faculty in the Department of Geography developed this proposal during a faculty retreat and in subsequent discussion. All tenured and tenure-track faculty were given the opportunity to vote on the adoption of the BS/MS Geographic Information Science program at a faculty meeting held on October 3, 2014, and unanimously approved the program.

Section II: Need

Geographic Information Science (GIScience) is the integration of the theoretical representation of geographic space, absolute and relative positions and their relationships with physical and human attributes on the earth's surface. Geographic information science is composed of various geographical scientific and technological areas of study, including geographic information systems (GIS), satellite remote sensing, global positioning systems (GPS), cartography and visualization, and geospatial analysis and statistics. Graduates with skills in these areas of study are in high demand. The U.S. Department of Labor estimates that jobs for Geographers, a broader classification including GIScience, will grow by 29% during the 2012-2022 period (<http://www.bls.gov/ooh/life-physical-and-social-science/geographers.htm>). This rate is approximately 2.5 times the expected 11% rate of growth across all jobs.

While entry level jobs in GIScience are attainable with a Bachelor's degree, many analyst positions require Master's level training. For this reason, the Department of Geography began a Master's of Science in Geographic Information Science (MSGIS) in 2013. This program has successfully attracted 11 students, with a majority of these students coming from professional GIScience positions. Bachelor's students in the Department of Geography have expressed a strong desire to continue on into the MSGIS program in order to increase their marketability to potential employers. The combined length of the Geography BS and MSGIS programs makes this option a difficult commitment, in terms of time and finances, for some students.

The proposed degree program is intended to attract qualified undergraduate students into the MSGIS program early and decrease the time required to obtain an MSGIS degree, allowing students to gain valuable job skills and accelerate their careers. The proposed combined degree program is designed to be completed by students in five years and to culminate with simultaneous conferral of the Bachelor of Science and Master of Science degrees.

A combined BS/MSGIS program requiring five years to complete will help meet the goal of increasing the percentage of Utah citizens having graduate or professional degrees to 11% by 2020 (http://higheredutah.org/wp-content/uploads/2013/06/pff_2011_highered2020_report.pdf). Students will be able to obtain a Master's degree targeted towards GIScience professionals in a shorter time, without "watering down" the requirements of either the BS or MSGIS degrees. We believe that the combined program will entice undergraduate students to focus their studies on advanced, employable GIScience skills, and attract new students who might not have previously considered traditional degrees in

Geography. Furthermore, there is no competing Master's degree in GIScience in the state of Utah. A combined degree offers the opportunity to capture students who might otherwise go out of state for professional GIScience training.

Requirements

Requirements for the BS/MSGIS program will include:

1. Completion of 122 credit hours for the BS degree and 30 credit hours for the MSGIS degree. 122 credits is the normal course load for the BS. 30 credit hours is 5-6 credits below the normal course load for the MSGIS, reflecting required courses that students will take as undergraduate students that would normally be included as electives for the MSGIS.
2. Students will assemble a portfolio as graduate-level courses are completed, which includes examples of work demonstrating mastery of selected GIS skills. The portfolio will be defended during a final exam at the end of students' fifth year. This requirement is identical to the portfolio requirement for the MSGIS program.
3. Students must apply for admission into the program by April 1 of their junior year. Applications for entry into the program will be processed through the Graduate Admissions Office and requirements for the combined BS/MSGIS program will be consistent with the requirements for the normal MSGIS program. Notification of acceptance into the program will take place before May 1 of students' junior year. Applications will be processed and decisions made at the departmental level (this is consistent with current admission policies).
4. Students must be enrolled as Geography majors at the time of applying for the BS/MSGIS degree option.
5. Entering students must have at least a 3.0 cumulative GPA.
6. Admission into the combined BS/MSGIS program will follow the regular University of Utah Graduate School application process. All university requirements for graduate admissions must be met except posting of undergraduate degree. (Note: On the referral sheet that the department returns to graduate admissions, the department will note that the student has been accepted to the combined BS/MSGIS program. Graduate Admissions will then approve admission without the BS completed.)

Procedures

1. Upon acceptance into the combined BS/MSGIS program, students will be expected to complete the program within 2 years.
2. Transfer of the student from undergraduate to graduate status occurs after the completion of 122 hours of qualified studies. No course can be counted toward both degrees.
3. Students will be assigned a supervisory committee at the beginning of their final semester. The committee will consist of the Geography Director of Graduate Studies, who will chair the committee, and two faculty members in Geography.
4. The BS and MSGIS degree will be conferred simultaneously following the completion of the program. No student will be awarded a separate MSGIS degree without satisfying all requirements for the BS degree.
5. The Department of Geography will ensure that all requirements are met for each degree. Courses taken for the graduate degree will not be eligible for graduate credit until the requirements for both degrees are satisfied. Each degree will be awarded when all work is completed.
6. Students wishing to exit the combined program can apply qualifying coursework toward the traditional BS requirement without penalty.

Section III: Institutional Impact

We anticipate that the combined BS/MSGIS program will result in increased enrollments in the MSGIS program, as students will see the new program as an attractive option for completing a Master's degree

and improving their career options. As other similar combined BS/MS programs exist at the University of Utah, procedures to institute this program will not necessitate changes in existing administration within the University. As no new courses or research programs will be needed to accommodate this program, no changes in faculty, staff, or physical facilities will be required. No student will be adversely affected by this change as students can complete their BS degree after enrollment in the combined program without penalty.

Section IV: Finances

Additional costs in terms of faculty and staff time may be incurred by the increased number of MSGIS students. As with the current MSGIS program, a program fee of \$100/semester will be assessed when students enrolled in the combined BS/MSGIS program exceed the 122 credit hours required for the BS. Based on experience with the MSGIS, this program fee will defray any costs due to increased faculty and staff time due to increased enrollment in the MSGIS program.

Section V: Program Curriculum

Note: there are no proposed changes in the undergraduate or graduate curricula to complete the BS/MS degree

1. Bachelor of Science in Geography Requirements

University Requirements: 122 Hours (at least 40 upper division), DV, IR, WRTG, QI, GEN ED

A. Geography Core Courses (required of all majors):

GEOG 1000 Earth Environments and Global Change (3) SF

GEOG 1010 Introduction to Geographic Data (1)

GEOG 1400 Human Geography (3) BF

GEOG 3020 Geographical Analysis (4) QB, QI

GEOG 3040 Principles of Cartography (4)

GEOG 3140 Introduction to GIS (4) QI

Complete one of the following upper division physical geography courses:

GEOG 3/5200 Geomorphology: Mtns, Rivers, Deserts (4) SF

GEOG 3/5202 Regional and Global Climates (3)

GEOG 3/5210 Global Climate Change (3) SF

GEOG 3/5215 Climate Change and Its Impacts (3)

GEOG 3/5290 Water in Utah (3)

GEOG 3/5292 Snow and Ice (3)

GEOG 3310 Introduction to Natural Hazards (3) SF

Complete one of the following upper division human geography courses:

GEOG 3/5090 Introduction to Medical Geography (3)

GEOG 3350 Resource Conservation & Environmental Management (3) BF

GEOG 3/5375 Sustainable Transportation (3)

GEOG 3420 Political Geography (3)

GEOG 3/5440 Global Economic Geography (3) BF, IR

GEOG 3480 Urban Geography (3) BF

GEOG 3620 Geography of North American (3) DV

Complete one of the following upper division communication/writing courses:

GEOG 3/5270 Biogeography: Global Patterns of Life (4) SF, CW

GEOG 3/5400 Population Geography (4) BF, CW

B. Combined program core courses:

GEOG 1180 Introduction to Geo-Programming (3)

GEOG 3110 The Earth from Space: Remote Sensing of the Environment (3) SF

GEOG 5110 Environmental Analysis Through Remote Sensing (3)

GEOG 5140 Methods in Geographic Information Systems (4)

GEOG 5170 Satellites, Lasers and Compasses: Field Methods for Geographic Data (3)

Math Core:

MATH 1050 College Algebra (4) QA

Math or Physics Elective (pre-requisite for GEOG 6120 MSGIS elective):

MATH 1060 Trigonometry (3) QA

PHYS 2010 General Physics I (4) SF

2. Master of Science in Geographic Information Science Requirements

Core courses (24 credit hours):

GEOG 6000 Advanced Geographical Data Analysis (4)

GEOG 6150 Spatial Database Design for GIS (4)

GEOG 6160 Spatial Modeling with GIS (4)

GEOG 6161 Capstone in GIS (3)

GEOG 6162 Project Management (3)

GEOG 6165 Web GIS (3)

GEOG 6180 Geoprocessing with Python (3)

Elective courses (6-7 credit hours):

Select two of the following courses:*

GEOG 6010 Geocomputation (4)

GEOG 6020 Advanced Spatial Analysis (3)

GEOG 6120 Environmental Optics (3)

GEOG 6130 Advanced Remote Sensing Applications (3)

GEOG 6190 GIS Environmental & Public Health (3)

*Students may also take graduate seminars to fulfill this requirement

Ann Darling, Ph.D.
Associate Dean
Undergraduate Studies
Sill Center, UofU Campus

Dear Ann:

The College of Social and Behavioral Science (CSBS) is pleased to support the two curriculum proposals from the Department of Geography. These proposals have been approved by the Department of Geography and the CSBS Curriculum Committee.

The first document proposes the creation of eight emphases in geography. The designation of emphases will draw students' attention to one of these focused areas of study earlier in their academic careers. In turn, this will hopefully improve the college's 6-year graduation rate. Students pursuing one of these emphases will also be better prepared to compete for job in the growing field of geography.

The second document proposes a combined BS in Geography with a Master's degree in Geographic Information Science (MSGIS). Approval of this combined degree would allow the more highly qualified undergraduates majoring in Geography to complete both their BS and MSGIS degrees five years rather than the more typical six years. Jobs that require successful candidates to have GIS skills are forecast to grow by 29% between 2012 and 2022. Thus, approval of this combined BS/MSGIS degree program would help the University of Utah's graduates to compete in that job market.

Neither proposal involves additions, deletions, or modifications to the Geography Department's existing courses. The combined BS/MSGIS proposal does request a \$100/semester program fee for students at the time their combined credit hours exceed 122. This program fee is designed to defray the marginal costs associated with the administration this new joint program.

In sum, these two proposals are designed to meet students' needs for career-oriented curricula and to facilitate students' completion of their degrees in a timely fashion. As such, the College is pleased to support both proposals.

Sincerely,



Cathleen D. Zick, Ph.D.
Associate Dean