DEPARTMENT OF GEOGRAPHY

REQUIREMENTS FOR THE COMBINED BS/MSGIS (PROFESSIONAL) DEGREE

Requirements for the BS/MSGIS program include completion of 122 credit hours for the BS degree and 30 credit hours for the MSGIS degree. Students must apply for admission into the MSGIS program by April 1 of their junior year. Applications for entry into the program will be processed through the Graduate Admissions Office. Notification of acceptance into the program will take place before May 1 of students' junior year. Students must be enrolled as Geography majors at the time of applying for the BS/MSGIS degree option. Entering students must have at least a 3.0 cumulative GPA.

The combined BS/MSGIS Master's degree will require a minimum of **30** credit hours of courses from the required core course list and selected from the electives lists, or from research seminars offered (GEOG 6400-6599 or 6960), plus a final portfolio and oral defense taken at the completion of the last semester of study. Combined BS/MSGIS students must complete the required courses (listed below) plus a minimum of 6 credit hours of elective course work. A grade point average of 3.0 or higher in graduate course work is required. No graded work below a "B-" is acceptable toward the degree. No course can be counted toward both degrees. Both degrees will be awarded simultaneously following the completion of the program. The MSGIS degree cannot be awarded separately without satisfying all requirements for the BS degree. Courses taken for the graduate degree will not be eligible for graduate credit until the requirements for both degrees are satisfied.

Students may not register for Individual Projects, Directed Readings, Research Practicum, Thesis Research, Technical Report Research, Internships, Faculty Consultation, or similar courses to fulfill degree requirements. Master's students are required to complete 24 credit hours in residency in the Department of Geography at the University of Utah. All students must be registered for at least one course per Fall/Spring semester. The program usually requires approximately two years of full time study, however all work must be completed within four consecutive calendar years. Students wishing to exit the combined program can apply qualifying coursework toward the traditional BS requirement without penalty. For further degree requirement details and information, refer to the combined degree Geography Bachelor's of Science/Master's of Science in Geographic Information Science (MSGIS) Student Handbook.

All MSGIS students are required to assemble a portfolio as courses are completed which includes examples of work demonstrating mastery of the selected GIS skills (listed on the reverse side). Students will present this portfolio project and answer questions from the Supervisory Committee during the final oral exam at the end of the program.

GRADUATE PROGRAM OF STUDY CHECKLIST

COURSE NUMBER/TITLE	Credit Hrs.	Sem/Yr Taken	Grade
GEOG 6000 – Spatial Statistics	4		
GEOG 6150 – Spatial Data Design	4		
GEOG 6160 – Spatial Modeling with GIS	4		
GEOG 6161 – Capstone in GIS *(final Spring semester)*	3		
GEOG 6162 – Project Management	3		
GEOG 6165 – Web GIS	3		
GEOG 6180 – Geo-processing with Python	3		
TOTAL	**24**		
***** ELECTIVE COURSES (min. 6 credit hrs.)			
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 take graduate seminars to full this requirement			
TOTAL	**6 or 7**		
Final project and oral defense date:			

***** Elective courses are selected by the student with the assistance of the student's Supervisory Committee/Faculty Advisor.

(over)

Table 1. MSGIS Skills List.

Skill	Description
GIS Analysis	Perform core vector and raster GIS analyses including overlay, interpolation, map algebra, terrain modeling, network analysis, and multi-criteria analysis.
Spatial Data and Algorithms	Understand methods for acquiring, evaluating, creating, manipulating, editing, and converting data and metadata in preparation for spatial analysis. Be familiar with how operations are carried out and when they are applicable.
GIS Workflow	Understand the importance of workflow in GIS and how to develop a workflow to perform GIS operations and spatial analysis.
Model Building	Be able to interpret existing geoprocessing models, create new models, add tools and data to a model, and string tools together to form an analysis workflow. Be able to choose appropriate models for modeling static and dynamic geographic processes. Be able to document a model so that others can understand its purpose and how it works.
Cartography and Graphic Design	Be able to design maps for different purposes, mediums, and audiences, and demonstrate cartographic design principles including color and symbology theory.
Spatial Analysis	Design, implement, and report on the analysis of spatial data. Describe and test hypotheses regarding distributions of spatial datasets.
Data Models and Structures	Be able to explore the data models within a database, and understand its structure.
Database Design	Given specific requirements for data, be able to design appropriate data models. Be familiar with database design tools.
Structured Query Language (SQL)	Be familiar with SQL and be able to write queries involving spatial objects and relationships.
Project Design	Be familiar with how to develop a project plan, which includes defining and confirming the project goals and objectives, identifying tasks and how goals will be achieved, quantifying the necessary resources (e.g. staff, software, hardware), preparing reports, and determining budgets and timelines for completion.
Project Management	Demonstrate your ability to work individually and collaboratively. Successfully deliver a solution within the required time frame.
Communication Skills	Be able to effectively communicate technical aspects of your work to both technical and layperson audiences.
Basic Programming or Scripting	Be familiar with a programming or scripting language, and be able to build workflows or custom solutions for solving spatial analysis problems.

Portions of this skills list were adapted from “The essential skills to succeed in a GIS career” by Michalis Avraam, http://michalisavraam.org/2009/11/the-essential-skills-to-succeed-in-a-gis-career/