



**SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS**

New Specialization

UNIVERSITY:	SDSU
TITLE OF PROPOSED SPECIALIZATION:	Geographic Information Sciences
NAME OF DEGREE PROGRAM IN WHICH SPECIALIZATION IS OFFERED:	Geography (M.S.)
INTENDED DATE OF IMPLEMENTATION:	2018-2019 Academic Year
PROPOSED CIP CODE:	45.0702
UNIVERSITY DEPARTMENT:	Geography (SGRGE)
UNIVERSITY DIVISION:	Arts & Sciences (SGRAD)

University Approval

To the Board of Regents and the Executive Director: I certify that I have read this proposal, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.

3/26/2018

Institutional Approval Signature
President or Chief Academic Officer of the University

Date

1. Level of the Specialization:

Baccalaureate Master's Doctoral

2. What is the nature/purpose of the proposed specialization?

South Dakota State University (SDSU) requests authorization to offer a specialization in Geographic Information Sciences (GISc) for the M.S. in Geography. This request is in response to students' needs, market demands, and an ever-changing society. The GISc specialization prepares graduate students for careers in a wide range of geospatial information research and applications. Geographic Information Science encompasses the development, use, and applications of Geographic Information Systems (GIS), cartography, remote sensing, global positioning systems (GPS), and spatial statistics. A student completing this specialization will be prepared to take on advanced technical and leadership roles in federal, state and local agencies and firms employing GIS, remote sensing, and other geospatial technologies.

The University does not request new state resources.

3. Provide a justification for the specialization, including the potential benefits to students and potential workforce demand for those who graduate with the credential.

Many projections from government agencies and market research firms alike point toward considerable growth of the geospatial technology industry as well as growth in GIS-related

employment sectors and fields. The U.S. Department of Labor Employment and Training Administration (DOLETA), for example, cites an annual growth rate of approximately 35 percent for the geospatial technology industry, with reliable public sector revenue accounting for approximately one third of the industry's total annual receipts.¹ Likewise, P&S Market Research estimates a compound annual growth rate of 10.1 percent from 2017 to 2023 for the global GIS market.²

A particular highlight is the field of cartography and photogrammetry. According to the U.S. Department of Labor's Bureau of Labor Statistics (BLS), jobs in the field of cartography and photogrammetry are expected to grow by approximately 19% between 2016 and 2026, with a total estimated growth of “much faster than the average” for all occupations over this same period. With a median salary over \$62,750, employment in jobs related to cartography and photogrammetry are excellent opportunities for recent university graduates who have GIS experience and specialization.³

In the last five years, many state agencies have incorporated geospatial technologies and have created new positions for GISc analysts, technicians, programmers and managers. Some South Dakota agencies that employ persons with GISc training include the Department of Game, Fish and Parks, Department of Transportation, Department of Environment and Natural Resources, and Department of Public Safety to name a few. In addition, Native American tribal governments, city planning departments, and regional planning agencies have created new positions for GISc specialists. Increasingly, there is a demand for GISc professionals in private industry within South Dakota. Surveying and engineering firms throughout the state routinely hire GISc professionals. EROS Data Center employs persons with remote sensing skills. A specialization in Geographic Information Sciences will provide advanced training for individuals working in public and private industries throughout the state of South Dakota, the region and the United States. The South Dakota Department of Labor & Regulation⁴ and Bureau of Labor Statistics (BLS)⁵ predict employment growth in many of the anticipated occupations.

4. List the proposed curriculum for the specialization (including the requirements for completing the major – *highlight courses in the specialization*):

Prefix	Number	Course Title	Credit Hours	New (yes, no)
GEOG	710	Evolution of Geographic Thought	3	No
GEOG	714	Research and Writing	3	No
<i>Select 3 of the following options:</i>			9	
GEOG	573-573L	GIS: Data Creation and Integration Lab	3	No
GEOG	574-574L	GIS: Vector and Raster Modeling and Lab	3	No
GEOG	575-575L	GIS Applications and Lab	3	No
GEOG	583-583L	Aerial Remote Sensing and Lab	3	No
GEOG	584-584L	Remote Sensing and Lab	3	No

¹Employment and Training Administration, U.S. Department of Labor, *High Growth Industry Profile: Geospatial Technology*, on the internet https://www.doleta.gov/brg/indprof/geospatial_profile.cfm (visited February 2, 2018).

² P&S Marketing Research, on the internet at <https://www.psmarketresearch.com/press-release/global-geographic-information-system-market> (visited February 2, 2018).

³ Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2017-18 Edition*, on the Internet at <https://www.bls.gov/ooh/architecture-and-engineering/cartographers-and-photogrammetrists.htm> (visited February 2, 2018).

⁴ South Dakota Department of Labor and Regulations, *Employment Projections by Occupation*, on the internet at: <https://www.southdakotaworks.org> (visited February 2, 2018).

⁵ Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2017-18 Edition*, on the Internet at <https://www.bls.gov/ooh> (visited February 2, 2018).

Prefix	Number	Course Title	Credit Hours	New (yes, no)
GEOG	585-585L	Quantitative Remote Sensing and Lab	3	No
GEOG	741	Quantitative Remote Sensing for Terrestrial Monitoring	3	No
GEOG	743	Geospatial Analysis	3	No
GEOG	786	Geographic Information Systems	3	No
<i>Select one of the following options:</i>				
<i>Option A - Thesis</i>				
GEOG	798	Thesis	6	No
Electives will be determined in consultation with the advisor.			9	No
<i>Option B – Research/Design Paper</i>				
GEOG	788	Research Paper in Geography	6	No
Electives will be determined in consultation with the advisor.			11	No
Total number of hours required for completion of specialization			9	
Total number of hours required for completion of major			30-32	
Total number of hours required for completion of degree				
Option A			30	
Option B			32	

5. Delivery Location⁶

A. Complete the following charts to indicate if the university seeks authorization to deliver the entire program on campus, at any off campus location (e.g., UC Sioux Falls, Capital University Center, Black Hills State University-Rapid City, etc.) or deliver the entire program through distance technology (e.g., as an on-line program)?

	Yes/No	Intended Start Date
On campus	Yes	2018-2019 Academic Year

	Yes/No	If Yes, list location(s)	Intended Start Date
Off campus	No		

	Yes/No	If Yes, identify delivery methods ⁷	Intended Start Date
Distance Delivery (online/other distance delivery methods)	No		

B. Complete the following chart to indicate if the university seeks authorization to deliver more than 50% but less than 100% of the certificate through distance learning (e.g., as an on-line program)?⁸

	Yes/No	If Yes, identify delivery methods	Intended Start Date
Distance Delivery (online/other distance delivery methods)	No		

¹ The Higher Learning Commission (HLC) and Board of Regents policy requires approval for a university to offer programs off-campus and through distance delivery.

⁷ Delivery methods are defined in [AAC Guideline 5.5](#).

⁸ This question responds to HLC definitions for distance delivery.

5.33% of the Geographic Information Science specialization is available online.