

SOUTH DAKOTA BOARD OF REGENTS

Academic and Student Affairs
Consent

AGENDA ITEM: 6 – D (1)
DATE: December 7-8, 2022

SUBJECT

New Program Request – SDSU – Minor in Geospatial Intelligence

CONTROLLING STATUTE, RULE, OR POLICY

[BOR Policy 2:23](#) – New Programs, Program Modifications, Curricular Requests, and Inactivation/Termination

BACKGROUND / DISCUSSION

South Dakota State University (SDSU) requests authorization to offer a minor in Geospatial Intelligence. Geospatial Intelligence is a broad field that encompasses the intersection of geospatial data with social, political, environmental, and numerous other factors. The minor would be open to all students with an interest in working in the areas of national security, emergency management, or public safety. The minor would focus on geospatial techniques (GIS, remote sensing, data management, etc.) and analytical courses from political science, history, geography, etc. to provide students with foundational knowledge for success in the field of Geospatial Intelligence.

IMPACT AND RECOMMENDATION

SDSU plans to offer the minor in Geospatial Intelligence on campus and online. SDSU does not request new state resources, and no new courses will be required. SDSU estimates 7 students enrolled and 6 graduates by the fourth year of the program.

Board office staff recommends approval.

ATTACHMENTS

Attachment I – New Program Request Form: SDSU – Minor in Geospatial Intelligence

DRAFT MOTION 20221207_6-D(1):

I move to authorize SDSU to offer a minor in Geospatial Intelligence, as presented.



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

New Baccalaureate Degree Minor

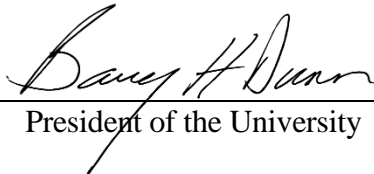
UNIVERSITY:	SDSU
TITLE OF PROPOSED MINOR:	Geospatial Intelligence
DEGREE(S) IN WHICH MINOR MAY BE EARNED:	Any
EXISTING RELATED MAJORS OR MINORS:	Geographic Information Sciences (B.S., minor, certificate), Geography (B.A., B.S., minor), Political Science (B.A., B.S., minor), History (B.A., B.S., minor)
INTENDED DATE OF IMPLEMENTATION:	2023-2024 Academic Year
PROPOSED CIP CODE:	43.0407
UNIVERSITY DEPARTMENT:	Geography & Geospatial Sciences
BANNER DEPARTMENT CODE:	SGGS
UNIVERSITY DIVISION:	Natural Sciences
BANNER DIVISION CODE:	3T

Please check this box to confirm that:

- The individual preparing this request has read [AAC Guideline 2.8](#), which pertains to new baccalaureate degree minor requests, and that this request meets the requirements outlined in the guidelines.
- This request will not be posted to the university website for review of the Academic Affairs Committee until it is approved by the Executive Director and Chief Academic Officer.

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.



President of the University

9/28/22

Date

1. Do you have a major in this field? Yes No

2. If you do not have a major in this field, explain how the proposed minor relates to your university mission and strategic plan, and to the current Board of Regents Strategic Plan 2014-2020.

South Dakota State University (SDSU) requests authorization to offer a baccalaureate minor in Geospatial Intelligence. Geospatial Intelligence (GEOINT) is a broad field that encompasses the intersection of geospatial data with social, political, environmental, and numerous other factors. The Intelligence Community defines geospatial intelligence as “the exploitation and analysis of imagery and geospatial information to describe, assess and visually depict physical features and

geographically referenced activities on the Earth.”¹ This minor would be open to all students with an interest in a credential for working in national security, emergency management, or public safety careers.

The proposed minor fits within SDSU’s statutory mission to provide undergraduate and graduate programs of instruction in the liberal arts and sciences. The Department of Geography and Geospatial Sciences currently offers undergraduate and graduate level programs in Geography (B.A., B.S., M.S., minor), Geographic Information Sciences (B.S., M.S. specialization, minor, certificate), Community and Regional Planning (B.S.), and Geospatial Science and Engineering (Ph.D.) - Geography and Remote Sensing Specializations. The Geospatial Intelligence will complement existing geography and geospatial sciences programs offered by SDSU.

The Geospatial Intelligence minor will contribute to the South Dakota Board of Regents *Strategic Plan 2022-2027* Goal 4: Workforce and Economic Development the “Public post-secondary and higher education serves as a critical pipeline for the workforce locally in South Dakota and as well as nationally and globally.”²

In addition, the Geospatial Intelligence minor will contribute to the attainment of SDSU’s *Imagine 2023* strategic plan Strategic Goal 1 – Excellence through Transformative Education. The minor will utilize active and innovative teaching and learning practices and incorporates multiple cross-curricular skills, including inquiry and analysis, critical thinking, teamwork and problem-solving.³

3. What is the nature/purpose of the proposed minor? Please include a brief (1-2 sentence) description of the academic field in this program.

Geospatial Intelligence refers to the use of geospatial technologies to extract information for decision advantage in humanitarian response, strategic defense, security or investigative analysis. The proposed GEOINT minor would focus on geospatial techniques (GIS, remote sensing, data management, etc.) and analytical courses from political science, history, geography, etc. to provide students with foundational knowledge for success in the GEOINT community.

4. How will the proposed minor benefit students?

Students receiving the Geospatial Intelligence Minor would be situated to apply for national security jobs within the federal government, which include the National Geospatial-Intelligence Agency, Central Intelligence Agency, Federal Bureau of Investigation, Defense Intelligence Agency, National Security Agency, Military Intelligence, FEMA, and Drug Enforcement Administration, among others.⁴ Students could also work for government contractors at various agencies. Geospatial intelligence is used by more than just national agencies. Increasingly, local civil service agencies rely heavily on GEOINT skills to better protect and serve their communities. These skills can be used by law enforcement agencies and emergency management agencies for natural disasters and public health emergencies.

¹ National Geospatial-Intelligence Agency. <https://www.nga.mil/about/Mission.html> (visited September 13, 2022).

² South Dakota Board of Regents. <https://www.sdbor.edu/the-board/StrategicPlan/Pages/default.aspx> (page 15, visited September 13, 2022).

³ South Dakota State University. <https://www.sdstate.edu/imagine-2023-aspire-discover-achieve> (visited September 13, 2022).

⁴ https://www.nga.mil/resources/GEOINT_Basic_Doctrine_Publication_10.html

- 5. Describe the workforce demand for graduates in related fields, including national demand and demand within South Dakota.** *Provide data and examples; data sources may include but are not limited to the South Dakota Department of Labor, the US Bureau of Labor Statistics, Regental system dashboards, etc. Please cite any sources in a footnote.*

Geospatial intelligence occupations would require exposure to geospatial skills. Many projections from government agencies and market research firms alike point toward considerable growth of the geospatial technology industry as well as growth in Geographic Information Systems (GIS) and remote sensing-related employment sectors and fields. According to Verified Market Research, the Global Geospatial Solutions Market was valued at \$202 billion in 2021 and will reach \$506.2 billion by 2030, with a market growth rate of 12.1% between 2022 to 2030.⁵

CareerOneStop, sponsored by the U.S. Department of Labor's Bureau of Labor Statistics (BLS), expects jobs in the field of cartography and photogrammetry to grow by approximately 5% nationally between 2020 and 2030 and increase 13% in South Dakota from 2018 to 2028, with a median salary over \$68,900.⁶ Occupations in Intelligence Analysts are projected to grow by 3% nationally between 2020 and 2030, with a median income of \$83,640 and 4% increase in South Dakota from 2018 to 2028.⁷ Geographic Information Systems Technologists and Technicians are projected to increase nationally by 9% between 2020 and 2030, with a median income of \$95,270.⁸ Remote Sensing Technicians are projected to grow by 8% nationally from 2020 to 2030 and 13% in South Dakota from 2018 to 2028 with a median salary of \$49,030.⁹ Employment in jobs related to cartography, GIS and remote sensing are excellent opportunities for recent university graduates who have exposure to the technologies.

It is anticipated that there will be strong interest in this credential among students who wish to serve in national security occupations, particularly the National Geospatial-Intelligence Agency (NGA). This credential should be popular with SDSU ROTC (Army & Air Force) students, veterans, and active military who could complete the minor online. Majors from geography, geographic information sciences, political science, computer science, criminology, and history should have an interest in this minor.

- 6. Provide estimated enrollments and completions in the table below and explain the methodology used in developing the estimates.**

The estimates below are based on 10% of student enrollment in the Geography (36) and Geographic Information Sciences (25) majors for year 4. The number will increase as other majors identify the benefit of adding this minor.

⁵ <https://www.verifiedmarketresearch.com/product/geospatial-solutions-market/>
(visited August 25, 2022).

⁶ U.S. Department of Labor Employment and Training Administration. *CareerOneStop*, <https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Cartographers%20and%20Photogrammetrists&onetcode=17102100&location=UNITED%20STATES> (visited August 25, 2022).

⁷ O*NET/U.S. Department of Labor/Employment and Training Administration <https://www.onetonline.org/link/summary/33-3021.06> (visited September 16, 2022).

⁸ U.S. Department of Labor Employment and Training Administration. *CareerOneStop*, <https://cloudfront.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Geographic%20Information%20Systems%20Technologists%20and%20Technicians&onetcode=15129902&location=UNITED%20STATES&lang=en> (visited August 25, 2022).

⁹ U.S. Department of Labor Employment and Training Administration. *CareerOneStop*, <https://cloudfront.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=RemoteSensing%20Technicians&onetcode=19409903&location=UNITED%20STATES&lang=en> (visited August 25, 2022).

	Fiscal Years*			
	1 st	2 nd	3 rd	4 th
<i>Estimates</i>	FY 24	FY 25	FY 26	FY 27
Students enrolled in the minor (fall)	2	3	5	7
Completions by graduates	0	2	4	6

*Do not include current fiscal year.

7. What is the rationale for the curriculum? Demonstrate/provide evidence that the curriculum is consistent with current national standards.

The Department of Geography & Geospatial Sciences is going through an accreditation process in the spring of 2023 for a Geospatial Intelligence Certificate. The accreditation for the certificate is through the United States Geospatial Intelligence Foundation (USGIF).¹⁰ USGIF’s accreditation of collegiate Geospatial Intelligence Certificate and Degree Programs awards colleges and universities the ability to offer students GEOINT certificates accompanying an undergraduate college degree, independent, stand-alone graduate certificates, and/or full undergraduate or graduate degrees. The program benefits the students, colleges, universities, industry, government, and the GEOINT Community at large, by ensuring current hiring needs are reflected in cross-disciplinary classroom coursework. A USGIF GEOINT Credential proves to hiring organizations that the holder has the needed foundational knowledge and technical skills as well as critical thinking, reporting and synthesis abilities to successfully contribute to the GEOINT Community. The certificate is an 18-credit certificate, the same number of credits as a minor in the SDBOR system. The USGIF only offers the student a digital key for passing the certificate. By having the minor in Geospatial Intelligence students will have a credential on their transcript, as well. The Department of Geography and Geospatial Sciences modeled the requirements for the minor after the curriculum requirements at the University of Missouri for their Geospatial Intelligence Certificate program.¹¹ The coursework will cover a breadth of both technical and analytic subject matter that is essential in meeting the USGIF curriculum guidelines.

8. Complete the tables below. Explain any exceptions to Board policy requested.

A. Distribution of Credit Hours

Geospatial Intelligence Minor	Credit Hours	Percent
Requirements in minor	9	50%
Electives in minor	9	50%
Total	18	100%

B. Required Courses in the Minor

Prefix	Number	Course Title	Prerequisites for Course	Credit Hours	New (yes, no)
GEOG	280	Introduction to Remote Sensing	none	3	No
GEOG	372-372L	Introduction to GIS and Lab	none	3	No
GEOG	447	Geography of the Future	none	3	No
Subtotal				9	No

¹⁰ <https://usgif.org/education/#geoint-certificates>

¹¹ <https://geography.missouri.edu/current-students/geospatial-intelligence>

C. Elective Courses in the Minor: List courses available as electives in the program. Indicate any proposed new courses added specifically for the minor.

Technical Electives: Select one course from the following list. Credits: 3

Prefix	Number	Course Title	Prerequisites for Course	Credit Hours	New (yes, no)
GEOG	383-383L	Cartography and Lab	none	3	No
GEOG	471	Introduction to GIS Programming	GEOG 372	3	No
GEOG	473-473L	GIS: Data Creation and Integration and Lab	GEOG 372	3	No
GEOG	474-474L	GIS: Vector & Raster Modeling and Lab	GEOG 372	3	No
GEOG	475-475L	GIS Applications and Lab	GEOG 372	3	No
GEOG	476-476L	Web GIS and Lab	GEOG 372	3	No
GEOG	477-477L	Spatial Databases and Lab	GEOG 372	3	No
GEOG	480-480L	Satellite Remote Sensing and Lab	GEOG 280	3	No
GEOG	483-483L	UAS Remote Sensing and Lab	none	3	No

Analytical Electives: Select two courses from the following list. Credits: 6

Prefix	Number	Course Title	Prerequisites for Course	Credit Hours	New (yes, no)
GEOG	210	World Regional Geography	none	3	No
GEOG	317	Geography of Africa	none	3	No
GEOG	320	Regional Geography*	none	3	No
GEOG	425	Population Geography	none	3	No
GEOG	430	Geography of Europe	none	3	No
HIST	419	World Environmental History	none	3	No
POLS	350	International Relations	none	3	No
POLS	447	Latin American Politics	none	3	No

* GEOG 320 can be taken more than once the region can be different.

9. What are the learning outcomes expected for all students who complete the minor? How will students achieve these outcomes?

At the completion of the Geospatial Intelligence Minor students will be able to:

- Recognize and interpret geospatial patterns to develop solutions for GEOINT problems.
- Demonstrate competency in GIS and Remote Sensing tools and analyses.
- Recognize the importance of the human domain in GEOINT.
- Manage geospatial data and geovisualization.

Individual Student Outcome	Program Courses that Address the Outcomes				
	GEOG 280	GEOG 372/L	GEOG 447	Technical Electives	Analytical Electives
Recognize and interpret geospatial patterns to develop solutions for GEOINT problems.	X	X	X	X	X
Demonstrate competency in GIS and Remote Sensing tools and analyses.	X	X		X	
Recognize the importance of the human domain in GEOINT.			X		X
Manage geospatial data and geovisualization.		X		X	

10. What instructional approaches and technologies will instructors use to teach courses in the minor? *This refers to the instructional technologies and approaches used to teach courses and NOT the technology applications and approaches expected of students.*

The courses associated with the minor will be face-to-face and online with instruction using lecture, discussion, lab exercises, and written exercises.

11. Delivery Location

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., USD Community Center for Sioux Falls, Black Hills State University-Rapid City, Capital City Campus, etc.) or deliver the entire program through distance technology (e.g., as an online program)?

	Yes/No	Intended Start Date
On campus	Yes	2023-2024 Academic Year

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

	Yes/No	If Yes, identify delivery methods <i>Delivery methods are defined in AAC Guideline 5.5.</i>	Intended Start Date
Distance Delivery (online/other distance delivery methods)	Yes	015 Internet Asynchronous – Term Based Instruction	2023-2024 Academic Year
Does another BOR institution already have authorization to offer the program online?	No	If yes, identify institutions:	

B. Complete the following chart to indicate if the university seeks authorization to deliver more than 50% but less than 100% of the minor through distance learning (e.g., as an online program)? *This question responds to HLC definitions for distance delivery.*

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

Students may complete this minor online 100% online by selecting GEOG courses. The HIST and POLS electives (HIST 419, POLS 350, and POLS 447) are not currently offered online by the School of American and Global Studies.

12. Does the University request any exceptions to any Board policy for this minor? Explain any requests for exceptions to Board Policy. *If not requesting any exceptions, enter "None."*

None.

13. Cost, Budget, and Resources: Explain the amount and source(s) of any one-time and continuing investments in personnel, professional development, release time, time redirected from other assignments, instructional technology & software, other operations and maintenance, facilities, etc., needed to implement the proposed minor. Address off-campus or distance delivery separately.

The minor will be offered using existing resources only. The Department of Geography & Geospatial Sciences already has the resources, personnel, courses, lesson plans, and infrastructure required to implement the minor. No new investments are required at this time.

The department already has online programs in B.S. and B.A. in Geography, B.S. in Geographic Information Sciences, Minor in Geography, Minor in Geographic Information Sciences and has the online capacity to implement the Geospatial Intelligence Minor.

14. New Course Approval: New courses required to implement the new minor may receive approval in conjunction with program approval or receive approval separately. Please check the appropriate statement.

YES,

the university is seeking approval of new courses related to the proposed program in conjunction with program approval. All New Course Request forms are included as Appendix C and match those described in section 7.

NO,

the university is not seeking approval of all new courses related to the proposed program in conjunction with program approval; the institution will submit new course approval requests separately or at a later date in accordance with Academic Affairs Guidelines.