SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Site Request

UNIVERSITY:	**SDSU**
DEGREE(S) AND PROGRAM:	**Geographic Information Sciences (B.S.)**
NEW SITE(S): *Include address of new physical locations.* *Delivery methods are defined in AAC Guideline 5.5.*	**Online**
INTENDED DATE OF IMPLEMENTATION:	**2020-2021 Academic Year**
CIP CODE:	**45.0702**
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 2:11, which pertains to new site 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.

Barry H. Dunn

President of the University

5/1/2020

Date

1. What is the need for offering the program at the new physical site or through distance delivery?

South Dakota State University (SDSU) requests authorization to offer the B.S. in Geographic Information Sciences (GISc) online. This request is in response to students' needs, market demands, and an ever-changing society. The B.S. in Geographic Information Sciences will prepare students to utilize their knowledge of geographic applications, and various geospatial technologies to meet the challenges of today's society. The program includes the necessary courses to prepare the graduate to function in geographic information science and allows students to develop their knowledge and skills in one of two concentrations: GIS Analysist or GIS Developer.

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, Bureau of Information Technology, 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 B.S. in Geographic Information Sciences will provide advanced training for individuals to become productive employees in public and private industries throughout the state of South Dakota, the region and the United States. The South Dakota Department of Labor & Regulation[4] and Bureau of Labor Statistics (BLS)[5] predict employment growth in many of the anticipated occupations.

Delivery of the BS in Geographic Information Sciences online will support SDSU's *Imagine 2023* strategic plan.[6] The degree helps to "Attain academic excellence" (Goal: Achieve Excellence Through Transformative Education). Specifically, it will:

1b. Develop and grow high-quality and distinct academic programs designed to meet the needs of diverse students and market demands;

1c. Increase programs offered which use a diversity of delivery methods, times, (or scheduling) and locations.

SDSU will not require additional resources.

---

[1]Employment 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*).

[6] https://www.sdstate.edu/imagine-2023-aspire-discover-achieve

2. Are any other Regental universities authorized to offer a similar program at the proposed site(s) or through distance delivery? If "yes," identify the institutions and programs and explain why authorization is requested.

No**.** SDSU is only Regental institution with a B.S. in Geographic Information Sciences. Northern State University currently offers a Geographic Information Sciences minor and certificate. South Dakota School of Mines and Technology offers a minor and certificate in Geospatial Technology. Neither are authorized to offer their programs online. SDSU is authorized for online delivery of a minor and certificate in Geographic Information Sciences.

3. Are students enrolling in the program expected to be new to the university or redirected from other existing programs at the university? Complete the table below and explain the methodology used in developing the estimates.

SDSU expects most of the students to be new to the university. Students like the flexibility of programs offered online, which allow them to continue to live and work anywhere in the state while they are completing their degree. It is not expected that delivery online will have much impact on the enrollments in SDSU's face-to-face, on-campus courses. Students are already enrolling in the available courses.

	Fiscal Years*			
	1st	**2nd**	**3rd**	**4th**
Estimates	FY 21	FY 22	FY 23	FY 24
Students new to the university	5	8	15	19
Students from other university programs	3	3	4	4
=Total students in the program at the site	8	19	38	58
Program credit hours (major courses)**	112	202	494	593
Graduates	0	0	2	6

*Do not include current fiscal year.
**This is the total number of credit hours generated by students in the program in the required or elective program courses. Use the same numbers in Appendix B – Budget.

4. What is the perceived impact of this request on existing programs in the Regental system?

Delivering the B.S. in Geographic Information Sciences online is not expected to negatively impact enrollment in SDSU's face-to-face, on-campus courses or enrollment in other Regental institutions.

5. Complete the table and explain any special circumstances. Attach a copy of the program as it appears in the current catalog. If there are corresponding program modifications

requested, please attach the associated form. Explain the delivery of the new courses and attach any associated new course request forms.

BS in Geographical Information Sciences	Credit hours	Credit hours currently available from this university online	Credit hours currently available from other universities available online	Credit hours new to this university for online delivery
System General Education Requirements *	21	21	21	0
Subtotal, Degree Requirements	21	21	21	0
College of Natural Sciences Requirements	5	5	5	0
Major Requirements	41	41	12	9
Subtotal, Requirements of the Proposed Major	92	58	0	0
Electives	53	53	53	0
Total, Degree with Proposed Major	120			

*Major requirements apply towards the 30 credits required for the System General Education Requirements SGR #3 and SGR #6.

As noted in question #1 students may select one of two options – GIS Analyst or GIS Developer. Students are currently able to complete the GIS Analyst option online. To allow students to also complete the GIS Developer option online, sections will be developed for GEOG 471 (new course), GEOG 476-476L, and GEOG 477-477L.

Requirements for the B.S. Geographic Information Sciences

Bachelor of Science in Natural Sciences

System General Education Requirements

- Goal #1 Written Communication: SGR #1 Electives Credits: 6
- Goal #2 Oral Communication: SGR #2 Elective Credits: 3
- Goal #3 Social Sciences/Diversity: GEOG 200 - Introduction to Human Geography (COM) [SGR #3] Credits: 3 (Major Requirement) or GEOG 210 - World Regional Geography (COM) [SGR #3] Credits: 3 (Major Requirement) and SGR #3 Elective Credits: 3
- Goal #4 Arts and Humanities/Diversity: SGR #4 Electives Credits: 6
- Goal #5 Mathematics: SGR #5 Elective Credits: 3
- Goal #6 Natural Sciences: GEOG 131-131L - Physical Geography: Weather and Climate and Lab (COM) [SGR #6] Credits: 4 (Major Requirement) and GEOG 132-132L - Physical Geography: Natural Landscapes and Lab (COM) [SGR #6] Credits: 4 (Major Requirement)

Department of Geography and Geospatial Sciences Requirements
Bachelor of Science Requirements: 13+

- Natural Sciences Credits: 10+
  - Any two lab sciences.
  - Coursework must include 2 prefixes.
  - MATH and STAT courses do not count toward the science requirement.
- AHSS 111 - Introduction to Global Citizenship and Diversity Credits: 3

- One declared minor outside of the major prefix OR a second major OR a teaching specialization. The minor may be a traditional minor within one department or it may be interdisciplinary involving more than one department. The minor can be in a different college. The minor must be declared no later than the student's third semester of enrollment.
- Capstone course in the major discipline
- Upper division coursework Credits: 33

System General Education and/or major coursework may satisfy some or all of the above requirements. Consult program advisor for details.

Major Requirements

- GEOG 131-131L - Physical Geography: Weather and Climate and Lab (COM) [SGR #6] Credits: 4 *
- GEOG 132-132L - Physical Geography: Natural Landscapes and Lab (COM) [SGR #6] Credits: 4 *
- GEOG 200 - Introduction to Human Geography (COM) [SGR #3] Credits: 3 *
- GEOG 210 - World Regional Geography (COM) [SGR #3] Credits: 3 *
- GEOG 372-372L - Introduction to GIS and Lab (COM) Credits: 3 *
- GEOG 421- Research Methods in Geography Credits: 3 *
- GEOG 447 - Geography of the Future (COM) Credits: 3 (Capstone) *
  or GEOG 454 - Sustainable Communities Credits: 3 (Capstone) *
- GEOG 484-484L - Remote Sensing and Lab (COM) Credits: 3 *
- Select one of the following options – GIS Analyst or GIS Developer. Credits: 15
  GIS Analyst Option
  - GEOG 473-473L - GIS: Data Creation and Integration and Lab (COM) Credits: 3 *
  - GEOG 474-474L - GIS: Vector and Raster Modeling and Lab Credits: 3 *
  - GEOG 475-475L - GIS Applications and Lab Credits: 3 *
  - Select six credits from the following list.
    - GEOG 270 - Introduction to Small Unmanned Aircraft Systems Credits: 3 *
    - GEOG 383-383L - Cartography and Lab Credits: 3 *
    - GEOG 471 - Introduction to GIS Programming [##NEW COURSE REQUEST PENDING BOR LEVEL APPROVALS] Credits: 3
    - GEOG 476-476L - Web GIS and Lab Credits: 3
    - GEOG 477-477L - Spatial Databases and Lab Credits: 3
    - GEOG 483-483L - Aerial Remote Sensing and Lab Credits: 3
    - GEOG 485-485L - Quantitative Remote Sensing and Lab Credits: 3

  GIS Developer Option
  - GEOG 471- Introduction to GIS Programming [##NEW COURSE REQUEST PENDING BOR LEVEL APPROVALS] Credits: 3
  - GEOG 476-476L - Web GIS and Lab Credits: 3
  - GEOG 477-477L - Spatial Databases and Lab Credits: 3
  - Select six credits from the following list.
    - GEOG 270 - Introduction to Small Unmanned Aircraft Systems Credits: 3 *
    - GEOG 383-383L - Cartography and Lab Credits: 3 *
    - GEOG 473-473L - GIS: Data Creation and Integration and Lab (COM) Credits: 3 *
    - GEOG 474-474L - GIS: Vector and Raster Modeling and Lab Credits: 3 *
    - GEOG 475-475L - GIS Applications and Lab Credits: 3 *

- GEOG 483-483L - Aerial Remote Sensing and Lab Credits: 3
- GEOG 485-485L - Quantitative Remote Sensing and Lab Credits: 3

Electives

- Taken as needed to complete any additional degree requirements.

For those seeking technical careers in GISc, these additional courses are suggested:

- CEE 106-106L - Elementary Surveying and Lab Credits: 3, 1
- CEE 434 - Hydrology Credits: 3
- CSC 105 - Introduction to Computers (COM) Credits: 3
- CSC 150 - Computer Science I (COM) Credits: 3
- CSC 205 - Advanced Computer Applications (COM) Credits: 3
- CSC 474 - Computer Networks Credits: 3
- GE 121 - Engineering Design Graphics I Credits: 1
- GEOG 384-384L - Advanced Cartography and Lab Credits: 3
- GEOG 485-485L - Quantitative Remote Sensing and Lab Credits: 3
- INFO 101 - Introduction to Informatics [SGR #6] Credits: 3
- MATH 115 - Precalculus (COM) [SGR #5] Credits: 5
- MATH 120 - Trigonometry (COM) [SGR #5] Credits: 3

Total Required Credits: 120

*Courses offered online by SDSU.

Academic Requirements
Students must earn at least a "C" in each course used to meet the major requirements.

6. How will the university provide student services comparable to those available for students on the main campus?

An academic advisor will be assigned to those distance students in the major. They will connect with the students using e-mail, phone, Skype, and numerous other technologies as they communicate. A student services facilitator is housed in Continuing and Distance Education and is available to assist students in connecting to necessary resources online and on campus. Finally, online tutoring support is available through Smarthinking (Pearson Education) and student services such as disability services accommodations will be available to students upon request.

The South Dakota State University Hilton M. Briggs library has long served students engaged in coursework away from campus. This includes students enrolled online. Library support services will be available to students through a variety of means:

- Students can contact librarians for research assistance. The librarian provides online research guides and is available for consultations with faculty and students.
- Distance Library Services include book and article delivery for materials owned by the library. Students may request materials not held by the library through interlibrary loan.
- SDSU students have online access to research databases such as Web of Science, EBSCOhost MegaFILE, and JSTOR.

Students will have access to technical support provided by SDSU’s Information Technology Services.

7. Is this program accredited by a specialized accrediting body? If so, address any program accreditation issues and costs related to offering the program at the new site(s).

No.

8. Does the university request any exceptions to Board policy for delivery at the new site(s)? Explain requests for exceptions to Board policy.

No.

9. Cost, Budget, and Resources related to new courses at the site: 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. *Complete Appendix B – Budget using the system form.*

The Department of Geography and Geospatial Sciences is not requesting additional faculty or equipment to support online delivery of the B.S. in Geographic Information Sciences. Tuition revenue generated from online tuition will adequately fund the program. Because nearly all courses are already online or will be in the near future, a budget is not provided. Growth that requires additional courses will be met by self-support tuition.