UNIVERSITY SYSTEM OF GEORGIA

USG Academic Degree Program Application

Fall 2025

Points of Contacts

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Additional guidance and templates as well as the change history for this document is available at https://www.usg.edu/academic_programs/new_program_review.

A. OVERVIEW

1. Institution Name:

The University of Georgia

2. School/College:

Franklin College of Arts and Sciences

3. Academic Department:

Department of Geography

4. Degree Name:

Bachelor of Science

5. Degree Acronym:

B.S.

6. Major:

Geospatial Data Science

7. CIP Code (8 digit):
Please use 00 for the last 2-digit extension unless using the same CIP code for similar institutional program.

30440100

8. Delivery Mode: Mark all that apply.

☒ ON CAMPUS: A program of study leading to a degree completed with 50% or more of courses offered consistently on-site in a classroom setting at a campus, center or instructional site. (Consistent with SACSCOC requirements concerning notification of changes in delivery mode.)

☐ HYBRID: A program of study leading to a degree completed with more than 50% offered consistently online, but some courses in the program will require on-site attendance at a campus, center or instructional site.

☐ ONLINE: A program of study which can be completed entirely at a distance. No campus visits are required for coursework. Students may be required to attend program orientations or to complete coursework in a specified instructional setting (clinical, internship, practicum).

9. For On Campus or Hybrid programs, where will the program be offered? Mark all that apply.

☒ Main campus
☐ Branch Campus or other Off Campus Instructional site: (Specify Here)

10. Anticipated Semester and Year of Initial Student Enrollment:

Fall 2027

11. Describe disciplinary accreditation requirements associated with the program (if applicable, otherwise indicate not applicable).

N/A

12. Specify SACSCOC requirements. Check with your SACSCOC Liaison and mark all that apply.

☒ Substantive change requiring notification only[1]
☐ Substantive change requiring approval prior to implementation[2]
☐ Level Change[3]
☐ None

13. Enter the number of credit hours required to complete the degree program, excluding any institutional requirements such as physical education activity/basic health or orientation courses.

a. Required Program Hours:

120

b. Are you requesting a credit hour requirement waiver (either below or above traditional credit hour length requirements) as prescribed by the University System of Georgia?

See the Academic and Student Affairs Handbook Section 2.3.5 Degree Requirements.

☒ No
☐ Yes (If yes, explain the rationale for the request in the space below)

B. PROGRAM ALIGNMENT

14. How does the program align with the USG System Wide Strategic Plan?

The proposed Bachelor of Science degree in Geospatial Data Science aligns with the USG System Wide Strategic Plan 2029 by addressing Student Career Development and Real-World Experience. This degree will position undergraduate students for long-term success and community impact through in-demand careers in Georgia and nationwide that require geospatial skills and foundational knowledge in technologies such as positional navigation (e.g., GPS), remote sensing, geographic information systems (GIS), unmanned aerial systems (UAS) and mapping, especially using Geospatial Artificial Intelligence (GeoAI) analyses including machine learning and deep learning. Applications of geospatial technologies and analyses address real-world needs and challenges such as coastal hazard assessment, disease spread, land use/land cover change, urban/rural planning and development, water quality and forest health monitoring, disaster management and predicting agricultural production, just to name a few.

[1] See page 42 (Requiring Notification Only) of SACSCOC Substantive Change Policy and Procedures document.
[2] See page 41 (Requiring Approval Prior to Implementation) of SACSCOC Substantive Change Policy and Procedures document.
[3] See page 20 (Level Change Application) of SACSCOC Seeking Accreditation at a Higher or Lower Degree Level document for level change requirements.

15. How does the program align with your institutional mission, and the function of institutions in your institution's sector as outlined in Board Policy 2.8?

    As the state's oldest Research University, the University of Georgia is Georgia's land-grant and sea-grant institution, as well as an Agricultural Experiment Station. This major directly aligns with UGA's mission to conserve and enhance Georgia's and the nation's cultural and environmental heritage. This program focuses on the geographic location and spatial relationships of human activities, natural phenomena/processes, and rapidly evolving technologies that fulfill UGA's commitment to excellence in technical innovation, public service, and economic development.

16. How does the program fit with the current strengths and overcome existing gaps of the department(s)/unit(s) that will coordinate this program? What was the impetus for this program? Consider current program offerings, course offerings, faculty expertise, and available resources.

    Since its inception in the 1950s, the creation, assessment and use of maps has been central to the UGA Department of Geography. Beginning with traditional land surveying and hand-drawn maps, faculty and students used geographic equipment, cartographic principles, photogrammetry and aerial photographs to document parcel boundaries, land use, forest cover, hydrology, geology and landforms. With the launch of U.S. Landsat Earth observing satellites in the 1970s, strategic faculty hires expanded the department's expertise to include remote sensing, followed by computer mapping and geographic information systems (GIS) in the 1980s. The 1990s saw an explosion of digital advancements in geospatial analysis, web-based mapping, analytical photogrammetry for 3D mapping and satellite sensors. From the 2000s to today, geospatial data science has evolved to incorporate innovative technologies, multi-modal digital data and artificial intelligence to solve interdisciplinary problems and meet critical societal and environmental challenges. Generally defined as the intersection of data science and Geographic Information Science (GIScience), geospatial data science incorporates the analysis, visualization, development and management of large datasets to examine spatial patterns, trends and relationships leading to a better understanding of the Earth, people and processes.

    Responding to students' interest in GIS and other geographic techniques, the Undergraduate Certificate in GIScience was developed to prepare students with the basic training necessary to enter this rapidly expanding field. Students in Geography, as well as other UGA departments, schools and colleges (e.g., Geology, Odum School of Ecology, Crop and Soil Science, College of Environment and Design, the College of Engineering, and the Warnell School of Forestry and Natural Resources) were extremely interested in obtaining the GIScience Certificate. From 2015 onward, there has been steady increase in the number of certificates awarded, while the number of undergraduates enrolled and working towards this Certificate has increased from 76, 88, 89 and 112 in the Spring of 2023, 2024, 2025 and 2026, respectively (Figure 1).

    Given the success of the certificate program and the exponential growth in Artificial Intelligence/Geospatial Artificial Intelligence (GeoAI), unmanned aerial systems (UASs or drones), nannosatellites, lidar and geovisualization (e.g., augmented/virtual reality), the faculty are proposing a new B.S. degree in Geospatial Data Science. The Geography Department currently has seven tenure-track faculty members and two Clinical Professors in Community Geography and Outreach who already teach a suite of courses applicable to the proposed degree in Geospatial Data Science. While GeoAI is incorporated into many geospatial courses, the faculty also teach dedicated GeoAI courses and the department's most recent faculty hire holds a split position between Geography and the UGA Institute of Artificial Intelligence. To-date we have received support of the proposed Geography B.S. Geospatial Data Sciences degree from the UGA Departments of Geology, Statistics, Marine Sciences and Crop and Soil Sciences, as well as the School of

Computing, College of Environment + Design, Odum School of Ecology, Warnell School of Forestry and Natural Resources and the Institute of Artificial Intelligence.

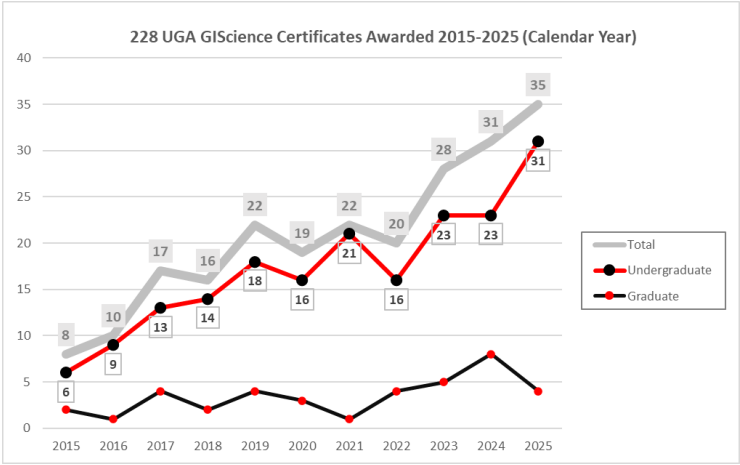

Figure 1. The number of undergraduate GIScience Certificates awarded 2015-2025.

In terms of resources, the Geography Department has four GIScience computer labs in the UGA Geography-Geology Building, with a total of 66 computers, and ample teaching classrooms. The Department has field computers, GPS units, weather stations and portable environmental and meteorological sensors for environmental data collection. The Geography Center for Geospatial Research also has 15 UASs equipped with true-color, multispectral, hyperspectral, thermal, lidar, ground penetrating radar, and magnetometer sensors, along with Augmented Reality/Virtual Reality (AR/VR) headsets, an augmented-reality sandbox/tangible landscape and a video wall for extended reality geovisualization. All are used for instruction and student research.

The faculty expect First-Year students to enter the program with the intent to obtain the B.S. degree in Geospatial Data Science, with some students in the first four years shifting to this major. Due to demand from Geography students majoring in Atmospheric Sciences (B.S.), and students outside of the department, faculty will continue to offer the Undergraduate Certificate in GIScience.

C. NEED

17. The program service area is used as the basis for labor market supply and demand analysis. What is the program's service area (local, regional, state, national)? This should be based on enrollment patterns, local needs, and the labor market. If outside of the institution's traditional service area, provide a compelling rationale for the institution to offer the program.

- *If the program is proposed to be online, the service area should be the entire state of Georgia.*
- *Click here to access the MEDLI tool for identifying workforce demand within a 50-mile radius of the institution's main campus.*

Employment opportunities for graduates with a B.S. degree in Geospatial Data Science are found in private companies, government agencies and non-profit organizations at local, regional, state, and national levels. They include titles such as Geospatial Data Scientist, as well as CAD Manager and GIS Technician, Analyst, Specialist, Manager and Developer. According to the 2025 Indeed Career Guide[4], typical salaries

[4] https://www.indeed.com/career-advice/finding-a-job/types-of-jobs-with-degree-in-gis

for GIS Technician are $51,490, GIS Analyst are $66,670 and CAD Manager are $77,123. O*Net Online[5] lists U.S. Bureau of Labor Statistics Standard Occupational Classifications (SOC) for Data Scientists (SOC 15-2051.00), Geographic Information Systems Technologists and Technicians (SOC 15-1299.02), Cartographers and Photogrammetrists (SOC 17-1021.00) and Surveying and Mapping Technicians (SOC 17-3031.00) as "Bright Outlook" careers having faster than average annual growth and median salaries ranging from $54,000 to $120,000 nationwide. Depending on the types of geospatial elective courses taken, other jobs available to a Geospatial Data Science graduate are Remote Sensing Analyst, Urban and Regional Planner, Cartographer, Photogrammetrist, Forest and Marine Resources Manager, Engineer Assistant, Architect Assistant, Geospatial Intelligence Analyst and Web-based Mapping Specialist, just to name a few. Recent graduates with knowledge and training in GIS, GeoAI and programming are working in high tech positions at GoogleX, Amazon, Meta, The Weather Channel, ESRI, Space Companies, PlanetLabs, as well as government agencies such as the NASA, the U.S. Census Bureau, U.S. Forest Service, the National Park Service, National Weather Service and the U.S. Department of Agriculture. Within the state, Geography graduates may work for the Georgia Department of Natural Resources, Georgia county and city urban and rural planning departments and non-profit organizations such as The Nature Conservancy. These jobs are located in all 23 counties within a 50-mile radius of the University of Georgia and are especially prevalent in Gwinnett County, one of the fastest growing counties in Georgia. Details on occupational opportunities in the U.S. and Georgia are provided in section C.1. The growing demand for geospatial data collection, analysis and management converging with AI Machine Learning and drone technology in the commercial sectors combines to set the stage for a new undergraduate degree in Geospatial Data Science (B.S.) at the University of Georgia.

C1. WORKFORCE DEMAND

18. Based on the program's service area, what is the employment outlook for occupations related to the program. An Excel version of the CIP to SOC crosswalk is also available from NCES, but additional SOC codes can be selected with rationale. For each SOC Code/Occupation listed below, please specify if this degree will allow students to go directly into the occupation or if additional education is required before entering the occupation. If data for the service area is not available, then use state- or national-level data. **Only list the jobs for which the program actively prepares students for that career.**

Possible resources:

- *O*-Net, including the median salary for the related occupations identified in question*
- *GDOL Labor Market Explorer Website*
- *Click here for additional resources.*
- *For a custom Georgia geography – request a Jobs EQ report from USG Academic Affairs office.*

[5] https://www.onetoonline.org/find/result?s=geospatial

Labor Market/Career Placement Outlook/Salary:

SOC Code & Occupation	Additional education required for entry level?	Current Employment	Annual Openings	% Growth over Ten Years	Median Salary
15-2051.00 Data Scientists **Bright Outlook**	No, (Additional experience is desired and this degree requires 3 credits of internship or research course)	Yes, O*-Net lists 245,900 employees in US in 2024 and 7,160 in Georgia in 2022.	O*-Net projects 23,400 or more job openings over the period 2024-2034 for the US nationwide, and 9,860 openings in Georgia, 2024-2034.	O*-Net notes as a Bright Outlook occupation expected to grow faster than average (34% in US, and 38% in Georgia)	O*-Net projects $57.80 hourly, $120,230 annual salary in US and $50.16 hourly and $104,340 annual in Georgia
15-1299.02 Geographic Information Systems Technologists and Technicians **Bright Outlook**	No, (Additional experience is desired and this degree requires 3 credits of internship or research course)	Yes, O*-Net lists 47,200 employees in US in 2024 and 17,720 in Georgia in 2022.	O*-Net projects to have 510,500 job openings in 2034 (31,300 annual) for the US and 19,400 openings in 2032 (1,200 annual 2022-2032) in Georgia.	O*-Net notes as a Bright Outlook occupation expected to grow faster than average (8% in US and 10% in Georgia) over 2024-2034, with new and emerging occupations for US nationwide.	O*-Net projects $56.05 hourly, $116,580 annual salary in US, $50.29 hourly and $104,610 annual in Georgia.
17-1021.00 Cartographers and Photogrammetrists **Bright Outlook**	No, (work-related experience, on-the-job training, and/or vocational training is desired. This degree requires 3 credits of internship or research course)	Yes, O*-Net lists 13,400 employees in US in 2024 and 570 in Georgia in 2022.	O*-Net projects to have 1,000 or more job openings over the period 2024-2034 for the US nationwide, and 40 annual openings in Georgia.	O*-Net notes as a Bright Outlook occupation expected to grow faster than average (5-6% or higher in US, and 11% in Georgia)	O*-Net projects $39.13 hourly, $81,390 annual salary in US and $30.11 hourly and $62,630 annual in Georgia.

17-3031.00 Surveying and Mapping Technicians **Bright Outlook**	No, (Additional experience is desired and this degree requires 3 credits of internship or research course)	Yes, O*-Net lists 59,400 employees in US in 2024 and 1,330 in Georgia in 2022.	O*-Net projects to have 62,100 or more job openings over the period 2024-2034 for the US nationwide, and 1,400 openings in Georgia in 2032.	O*-Net notes as a Bright Outlook occupation expected to grow 5% in US, and 6% in Georgia.	O*-Net projects $26.08 hourly, $54,240 annual salary in US and $23.46 hourly and $48,810 annual in Georgia.
19-4099.03 Remote Sensing Technicians	No, (Additional experience is desired and this degree requires 3 credits of internship or research course)	Yes, O*-Net lists 83,200 employees in US in 2024 and 2,790 in Georgia in 2022.	O*-Net projects to have 86,200 or more job openings over the period 2024-2034 for the US nationwide, and 2,980 openings in Georgia in 2032.	O*-Net notes this occupation is expected to grow 4% in US, and 7% in Georgia.	O*-Net projects $29.94 hourly, $62,280 annual salary in US and $33.33 hourly and $69,320 annual in Georgia.
19-3051 Urban and Regional Planners	Yes, (Additional experience is desired and this degree requires 3 credits of internship or research course. Also, CED courses are electives for the BS and although many job announcements require graduate degrees, UGA-CED has both Masters and Ph.D. programs and the Geography GIScience Certificate should fulfill requirement for postbaccalaureate certificate.)	Yes, O*-Net lists 44,700 employees in US in 2024 and 1,060 in Georgia in 2022.	O*-Net projects to have 46,200 or more job openings over the period 2024-2034 for the US nationwide, and 1,130 openings in Georgia in 2032.	O*-Net notes this occupation is expected to grow 3% in US, and 7% in Georgia.	O*-Net projects $42.94 hourly, $89,320 annual salary in US and $34.38 hourly and $80,030 annual in Georgia.

Rationale for selected SOC Codes: SOC Codes should only be included if the proposed program will explicitly prepare students for such a career. Please address how the selected SOC Codes/Occupations will align with employment demand in the service area.

Graduates with a degree in Geospatial Data Science (B.S.) are explicitly prepared to for a career as a Data Scientist (SOC 15-2051.00), as well as a Geographic Information Systems Technologist/Technician (SOC 15-1299.02) based on the Geospatial Anchor courses (e.g., Statistics, Introduction to GIscience, Data Science in Geography) and their required capstone/professional development and internship/research experience. Depending on their elective courses, they may also be qualified for employment as Cartographers and Photogrammetrists (SOC 17-1021.00), Surveying and Mapping Technician (SOC 17-3031.00) or Remote Sensing Technicians (SCO 19-4099.03). Although not listed in the table above, graduates may be qualified for other potential occupations because this degree requires 6 additional credit hours of courses in other University of Georgia departments, colleges, and schools. These include occupations such as Precision Agriculture Technicians (SOC 19-4012.01), Urban and Regional Planners (SOC 19-3051.00), Forest and Conservation Technicians (SOC 19-4071.00) and Geological Technicians (SOC 19-4043.00), to name a few.

Advisors will recommend all Geography Geospatial Data Science graduates are exposed to Geospatial Artificial Intelligence (GeoAI) by taking electives such as GEOG 4591/6591, Introduction to GeoAI, and GEOG 4592, Advanced GeoAI. The department's latest faculty hire has a joint appointment in Geography and the UGA Institute of Artificial Intelligence and will be developing courses integrating drones, sensors and on-board AI capabilities (i.e., edge computing). In addition, AI is being incorporated into many of the geospatial courses in Geography and other departments, colleges and schools at UGA. The same is true for computer programming skills. Most of the geospatial courses include the use of Python and/or R, while students may also elect to take courses such as GEOG 4590/6590-4590L/6590L, Programming for Geospatial Information Science, and courses in Computer Science and Statistics.

C2. SUPPLY

19. Target Market.

a. Who is the target market/audience for recruitment into this program? Include any special populations this program may target, including alumni, non-traditional (e.g., working adults, veterans), and underrepresented populations of students.

With the wide breadth of high-paying occupations available to graduates with a B.S. degree in Geospatial Data Science, this program is expected to appeal to both incoming First-Year students and Second/Third-Year students who discover geospatial aspects of other degree programs. Faculty in Geography often have international collaborations and actively recruit students from underrepresented populations. Veterans who have had exposure to geospatial technologies such as remote sensing, drones, satellite navigation and mapping, will find this degree opportunity especially beneficial as they transition to a new career. We are also proposing to hire an Undergraduate Programs and Industry Engagement Coordinator who will support all three of our undergraduate programs (Geography, Atmospheric Sciences and Geospatial Data Sciences) to strengthen recruitment and build connections among students, faculty alumni, employers and industry partners.

b. Who are the specific partners you are working with to reach your target market and create a career pipeline with this program. Describe the partnerships. (For example, internal pipelines, high schools, career academies, institutions of higher education, employers, community partnerships, professional associations).

Faculty in Geography are active in professional societies such as the American Association of Geographers (AAG), American Meteorological Society (AMS), American Geophysical Union (AGU), and American Society for Photogrammetry and Remote Sensing (ASPRS), among others. Serving in leadership roles, presenting their research at annual national and international conferences and advising UGA student chapters of these organizations provide opportunities to promote the B.S. in Geospatial Data Science degree. Faculty and students involved in AAG, AMS, AGU, and ASPRS, as well as the UGA Geography Community GIS Laboratory, Center for Geospatial Research, and the Small Satellite Research Laboratory regularly reach out to local middle school and high schools to promote career opportunities in Geography.

20. Are there any similar programs at your own institution? This includes programs with similar/same course content (beyond general education).

☐ No

☒ Yes *(Provide additional information below about the program(s) including the percentage of similar/same coursework and any opportunities there may be for synergy/collaboration between programs.)*

Within UGA, the Warnell School of Forestry and Natural Resources offers an Area of Emphasis in Geospatial Information Science within their Natural Resources Management and Sustainability (B.S.F.R.) degree. Faculty in the Warnell School typically recommend their GIS Emphasis students enroll in Geography geospatial courses and the GIScience Certificate Program. Warnell offers six undergraduate geospatial courses (FANR) listed in Appendix A, all of which fullfill the requirement for six credit hours of geospatial courses from outside the Geography Department. Since the Natural Resources Management and Sustainability (B.S.F.R.) degree curriculum also includes Geography courses, the faculty expect the proposed B.S. degree to be of great interest to Forestry and Natural Resources students.

The faculty has had discussions about this proposed degree with faculty in the School of Computer Science, College of Environment and Design, Odum School of Ecology, College of Engineering, College of Agricultural and Environmental Sciences and the Franklin College of Arts and Sciences Departments of Geology, Marine Sciences and Statistics. The School of Compting and the Franklin College Department of Statistics offer a B.S. degree in Data Science, but without the geospatial focus. All of these units expressed interest in a new major in Geospatial Data Science because it offers opportunities for Geography students to take their courses, and vice versa. In addtion, the faculty plan to continue to offer the Certificate in Geographic Information Science because it is highly desired by students in other UGA units and students obtaining a B.S. degree in Atmospheric Science within Geography.

21. Do any other USG higher education institutions in close proximity or sector service area offer a similar program? Look at 4-digit CIP Codes in the CAAP to identify similar programs.

☐ No

☒ Yes *(Provide a rationale below for the institution to offer the program.)*

Georgia Gwinnett College and the University of North Georgia at Gainesville are the closest USG, institutions (within 50 miles) to the University of Georgia. Georgia Gwinnett College does not have programs in GIScience, data science or computer information systems. The University of North Georgia Gainesville campus does not offer a B.S. degree in GIScience or Data Science. It has an Environmental Spatial Analysis B.S. degree that includes courses in GIS, remote sensing and information technology. They offer Geographic Information Science and Geospatial Intelligence Certificates, and the Department of Mathematics has a Data Science Minor.

Within the USG, only Kennesaw State University offers a B.S. degree in Geospatial Science. This major includes three areas of concentration: Human-Environment Systems, Information Systems and Land Surveying. Their website lists their program as face-to-face, online and hybrid (Bachelor of Science in Geospatial Sciences - Kennesaw State University). Kennesaw also offers an Undergraduate Certificate in Geographic Information Science. According to the IPEDS database, KSU graduated 21 GIScience (B.S.) degrees and 18 Undergraduate GIScience Certificates in 2023-2024, both are listed as a Distance Education Program.

Other USG universities offer geospatial or data science certificates, geospatial areas of emphasis or minors. Georgia College and State University, Milledgeville has an undergraduate certificate in Geographic Information Science, as well as a Data Science B.S. in the Department of Information Systems & Computer Science. The University of West Georgia, offers a Minor in GIScience and B.S. in Earth and Environmental Sciences with a GIScience Concentration. Georgia Southern University offers a Minor in GIScience within their baccalaureate programs in Geosciences, Sustainability Science and Environmental Science. Georgia State University offers a Bachelor of Interdisciplinary Studies with concentrations in Data Science, Environmental Science and GIScience, along with a certificate in GIScience.

The majority of these USG campuses are not in close proximity to UGA. Georgia State University in Atlanta is 70 miles from Athens, Kennesaw State University is approximately 85 miles from Athens, the University of West Georgia is over 120 miles away and Georgia Southern Univeristy is approximately 170 miles from UGA, with one-way commute times ranging from 1 ½ to 3 ½ hours.

One Non-USG institution in Georgia, Morehouse College in Atlanta, has a B.A. degree in Urban Studies – Urban Planning Concentration that includes GIScience courses.

22. Using IPEDS data, list the supply of graduates in similar programs in the service area. Use the 4-digit CIP Code to identify similar programs, and include programs at your institutions, at USG institutions, and at non-USG institutions within the service area.

Consider also programs/institutions that recruit within your service area. If your institution is near a border, this may include programs/institutions in border states.

Similar Programs	CIP Code	Supply[6] (Graduates/Completers)	Institutions
USG Institutions			
Geographic Information Science and Cartography	0702	16 UG Certificates in Geography	University of Georgia
Computer and Information Sciences, General	0101	10 UG Certificates in Computer Science	University of Georgia
Geographic Information Science and Cartography	0702	18d UG Certificates 21d BS	Kennesaw State University
Computer and Information Sciences, General	0101	41d BS	Kennesaw State University
Computer and Information Sciences, General	0101	1,206 BS	Georgia Institute of Technology

[6] Supply = Number of program graduates last year within the service area

Geographic Information Science and Cartography	0702	9 UG Certificates	Georgia State University
Computer and Information Sciences, General	0101	1 UG Certificate	Georgia State University
Geographic Information Science and Cartography	0702	NA	Georgia Gwinnett College
Computer and Information Sciences, General	0101	NA	Georgia Gwinnett College
Geographic Information Science and Cartography	0702	NA	Georgia Southern University
Computer and Information Sciences, General	0101	71 BS	Georgia Southern University
Computer and Information Sciences, General	0101	109 BS	University of North Georgia, Dahlonega
Geographic Information Science and Cartography	0702	26 Certificates	University of North Georgia, Gainesville
Geographic Information Science and Cartography	0702	NA	University of West Georgia
Computer and Information Sciences, General	0101	17d BS	University of West Georgia
Geographic Information Science and Cartography	0702	3 UG Certificates	Georgia College and State University, Milledgeville
Computer and Information Sciences, General	0101	4d PG Certificates	Georgia College and State University, Milledgeville
Non-USG Institutions			
Geographic Information Science and Cartography	0702	1 BS Urban Studies	Morehouse College
Computer and Information Sciences, General	0101	NA	Morehouse College

Source: IPEDS data for 2023-2024

(d) = Distance Education Program, UG = Undergraduate, PG = Postgraduate

C3. ANALYSIS OF DATA

23. Based on the data provided above, discuss how this program will help address a need or gap in the labor market? To what extent does the program align with talent demand or workforce strategies for the service area?

If any workforce letters of support, surveys or other qualitative indicators are being supplied to support the need, this should also be addressed here.

The proposed B.S. degree in Geospatial Data Science at UGA will fill a gap within the state of Georgia, especially outside of the Metropolitan Atlanta Area, that addresses education and training needed for growing professions such as Geographic Information Systems Technologists and Technicians, Data Scientists, Cartographers and Photogrammetrists and Surveying and Mapping Technicians, all listed by *O-Net as having Bright Outlooks with over 5% projected growth nationwide and 10% growth in Georgia. The curriculum is designed to allow students to specialize in a number of different areas such as geospatial data analysis, GeoAI, geovisualization/cartography, remote sensing, and drone technology and edge computing. The majority of the core course electives in the proposed B.S. degree involve computer programing, statistics, GIS and GeoAI with applications in disciplines from geography, urban planning and forestry to agriculture, geology, ecology and marine science. Letters of support from the UGA College of Environment and Design, Odum School of Ecology, Department of Crop and Soil Science in the College of Agricultural and Environmental Science,

School of Computing and the Department of Statistics in the Franklin College of Arts and Sciences are attached to this narrative. A sample of geospatial data science-related job opportunities in Georgia in June and July, 2026 are listed here.

Date	Job Title	Location
July 29, 2026	Engineering Technologist - GIS Insight Global	Marietta, GA
July 22, 2026	Geospatial Analyst – Senior Bluehawk LLC	GA
July 20, 2026	Geospatial Analyst, Senior BOOZ, ALLEN & HAMILTON, INC.	Fort Gordon, GA
July 20, 2026	Geospatial Analysis Expert BOOZ, ALLEN & HAMILTON, INC.	Fort Gordon, GA
July 16, 2026	GIS Analyst Actalent	Dunwoody, GA
July 12, 2026	Office of Transportation Data-Transportation Specialist 1; GIS Analyst 1; TRP050 (PG-K); Atlanta, GA. State of Georgia	Fulton, GA
June 30, 2026	Geospatial Analyst Expert SOS International LLC	Fort Gordon, GA
June 26, 2026	Geospatial Analyst — Senior and Expert Altamira Technology Corporation	Fort Eisenhower, GA
June 18, 2026	GIS Specialist/Special Project Planner City of Alpharetta, Georgia	Alpharetta, GA

D. CURRICULUM

24. List program-specific goals (objectives) and specific student learning outcomes for the program.

The main goal of our proposed Geospatial Data Science program is to position undergraduate students for long-term success and community impact through in-demand careers in Georgia and the nation that require geospatial skills and foundational knowledge in Geographic Information Science (GIScience) technologies such as GPS, remote sensing, geographic information systems (GIS), unmanned aerial systems (UAS) and mapping, especially using Geospatial Artificial Intelligence (GeoAI). Graduates of this degree program will have the skills and knowledge to apply geospatial technologies and machine learning/deep learning analyses to address real-world needs and challenges such as coastal hazard assessment, disease spread, land use/land cover change, urban/rural planning and development, water quality and forest health monitoring, disaster management and predicting agricultural production, just to name a few.

Students completing the Geospatial Data Science program should achieve eight learning outcomes and be able to:

1) Retrieve, manage, analyze, and interpret geospatial data related to concepts and theories in GIScience including energy-atmosphere-land-water interactions, scale, coordinate systems, and geometric and thematic accuracy;
2) Recognize authoritative data sources and appropriate spatial, spectral, temporal and radiometric resolutions for particular research questions and applications;
3) Articulate societal and environmental benefits, proper use and privacy concerns of geospatial technologies and analyses;

4) Describe geospatial data types including quantitative data (e.g., vector and raster data formats, images, point clouds, thermal and microwave data, lidar, ground-penetrating radar and spectroradiometer data) and qualitative data (e.g., perceptions and values of peoples, places and geographies);
5) Ask spatial questions and perform spatial analyses including query, proximity, overlay, network connectivity and modeling to monitor land/water/atmosphere processes, detect change and spatiotemporal patterns, assess human impacts and solve real-world problems.
6) Represent spatiotemporal data using cartographic principles and geovisualization techniques in 2D, 3D and 4D time animation.
7) Explore and execute GeoAI analyses, and obtain computer programming skills required for the ethical use of predictive models, generative AI, large language models.
8) Develop community connections and real-world experience with geospatial applications, through course projects, capstone and professional development courses, internships and/or faculty-monitored research in order to position students to enter the geospatial job market.

25. List the entire course of study required to complete the academic program.

- *Include course: prefixes, numbers, titles, and credit/contact hour requirements*
- *For undergraduate programs, specify pre/co-requisites*
- *Indicate the word "new" beside new courses*

The faculty designed this major to be flexible and offer many options of specialization to students in order to respond to the different careers that may be available to graduates of Geospatial Data Science (B.S.). Students will be introduced to different geospatial "tracks" in terms of technologies, techniques, and analyses (e.g., GIS, remote sensing, GeoAI, geovisualization) in the first two years. The major also allows flexibility in the domains of application such as physical geography, landforms, weather and climate, human geography, human-environment interactions, etc. In the third and fourth years, the faculty expect students will identify geospatial techniques they wish to focus on, as well as the domains of application for which they will select advanced courses.

The major will provide students with fundamental concepts and practices in programming, statistics, spatial analysis, GIScience, data management, and GeoAI because these areas are all incorporated into many, if not most, of the geospatial anchor courses. For example, GeoAI incudes machine learning and deep learning algorithms such as Random Forest, Support Vector Machines and Convoluted Neural Networks that are used for image classification and geospatial modeling covered in several courses. Although advisors will strongly encourage students to take both introductory statistics and programming courses, many geospatial courses introduce R and Python coding in the first two weeks of instruction.

New Geospatial Data Science (B.S.)

Gen Ed Core Courses (Beginning Fall 2027, 42 minimum Gen Ed Core credit hours are required including 12 Build a Foundation and 30 The Cornerstone Curriculum)

The courses listed for I. Build a Foundation and II. The Cornerstone Curriculum reflect preferred courses for those areas.

I. BUILD A FOUNDATION (15-17 hours)

I.A. Mathematical and Quantitative Reasoning (13-11 hours)

MATH 1113, 1113E Precalculus (3 hours), or MATH 2200, 2200E Analytic Geometry and Calculus (4 hours)

AND

GEOG 1140/L Our Digital Earth/Lab or GEOG 2011/L or 2011E Maps, Data, and Society (3 hours)

AND

STAT 2000, or 2000E Introductory Statistics or 2100H Introduction to Statistics and Computing (Honors) (4 hours) or STAT 2010 Statistical Methods for Data Scientists (3 hours) or CSCI 1300/1300L Introduction to Programming with Python/Lab (Prereq. MATH 1113, 1113E, 220E or 2200), or CSCI 1301/1301E Introduction to Computing and Programming (Prereq. MATH 1113, 1113E, 220E or 2200), or STAT 2360/2360L Programming and Data Literacy Using R/Lab (Prereq. STAT 2000, 200E, 2010, 2010H or BIOS 2010 or 2010E) (4 hours) or GEOL 1004 Applied Geostatistics for Earth Systems (3 hours)

I.B. Writing (6 hours)

ENGL 1101 English Composition I or ENGL 1101S English Composition I: Service Learning (3 hours)

AND

ENGL 1102 English Composition II (3 hours)

II. THE CORNERSTONE CURRICULUM (27- 32 hours)

II A Explore the World (12-14 hours)

A.1. Explore the Science of Living Things (3-4 hours)

FANR(ECOL)(GEOG) 1200 Natural History of Georgia, or ECOL 1000 Ecological Basis of Environmental Issues, or HONS(BIOL)(CHEM)(GEOL)(PHYS) 2080H, or other Science of Living Things course.

A2. Explore the Science of the Physical Universe (3-4 hours)

GEOG 1111/L Introduction to Physical Geography/Lab, 1112/L Introduction to Weather and Climate/Lab, 1113L Exploring Earth's Surface: Landforms and Environments/Lab, 2110/L Introduction to Physical Geography (Honors), 1140/L Our Digital Earth/Lab or 2120H/L Introduction to Weather and Climate (Honors) (4 hours) or GEOL 1001 Natural Hazards (3 hours)

A3. Explore the Human Experience (6 hours)

GEOG 2010H Introduction to Human Geography (Prereq. Permission of Honors), or GEOG 1101 or 1101E Human Geography: People, Places and Cultures, or GEOG 1125 Resources, Society and Environment (3 hours)

II B. Explore Human Connections (15-18 hours)

B6. Explore Global Issues and their Solutions (3-4 hours)

GEOG 1130 Introduction to World Geography, or GEOG 1101 Human Geography: People, Places and Cultures (3 hours)

AND

At least one additional course from GEOG or related geospatial discipline (3-4 hours) that fulfils the following Gen Ed Core requirements:

B1. Explore Social Connections (6 hours)

B.2. Explore the Reasoning Behind Ethical Decisions (3 hours)

B3. Explore the Connection between Humans and the Environment (0-3 hours, can share with other)

B4. Explore Multicultural Diversity within the United States (0-3 hours, can share with other)

B5. Explore Societies Outside the United States (3-4 hours)

III. EXPAND YOUR HORIZONS (4 hours)

University-wide Experiential Learning Requirement (1 course or activity) (3 hours)

University-wide FYOS Requirements (1 hour)

IV. IN-DEPTH EXPLORATION Major Required, Elective and Capstone Courses (32 hours)

- GEOG/ATSC 3910 (1 hour) Professional Dev in Geography and Atmospheric Sciences
- GEOG 4910 (1 hour) Capstone in Geography
- 30 additional credit hours, with the following requirements:
    - At least 15 hours of anchor courses in the Geospatial sphere (Anchor courses in Atmospheric Science and Geography are listed below.)
    - At least 6 hours at the 3xxx level or above in Geography courses NOT listed as Geospatial Anchor courses. (Additional Non-anchor Geography courses are listed in Appendix A.)
    - At least 3 hours of Internship or Research Geospatial Geography course
        GEOG 3991 Internship in Geospatial Data Science (new) or
        GEOG 3990 Internship in Geography (with approval), or
        GEOG 4921 Special Problems in Area Analysis, or
        GEOG 4960R, 4970R, or 4980R Faculty-Mentored Undergraduate Research I, II and III
    - At least 6 hours at the 3xxx level or above in geospatial electives outside of the Geography Department. Note: these cannot be Atmospheric Science courses. Suggested departments, colleges and schools include Anthropology, Ecology, Atmospheric Sciences, Disaster Management, Marine Sciences, Computer Science, Geology, College of Environment + Design, Warnell School of Forestry and Natural Resources, Crop and Soil Sciences, Statistics, Terry School of Business or Economics. Some suggested courses are listed below. A list of courses in other departments, colleges and schools at UGA are listed in Appendix A.

Courses for the major and Gen Ed core total 78-85 hours. Students need 35-42 hours more to graduate with 120 minimum for UGA degree

Geospatial Geography Anchor Courses (3XXX level or above)

- GEOG 3510-3510L Cartography and Graphics
- ATSC/GEOG 4100/4100L Programming for Atmospheric Scientists
- ATSC/GEOG 4140 Satellite Meteorology and Climatology
- GEOG 4300 Data Science in Geography
- GEOG 4330/4330L Aerial Photographs and Image Interpretation
- GEOG 4350/4350L Remote Sensing of Environment
- GEOG 4370/4370L/4370E Geographic Information Science
- GEOG(CRSS) 4375 GIS Applications in Agriculture
- GEOG 4380/4380L Transportation Modeling and GIS
- GEOG 4385/4385L Community GIS (Service Learning)
- ENGR(GEOG) 4390 CubeSats: Design, Integration, and Testing for Remote Sensing Satellites
- ENGR(GEOG) 4395 CubeSats II: Assembly, Integration, and Testing
- GEOG 4410/4410L Geovisualization and Data Visualization
- GEOG 4430/4430L Advanced Image Analysis and Photogrammetry
- GEOG 4450 Digital Image Analysis
- GEOG 4460 Field and Lab Methods in Remote Sensing
- GEOG 4470/4470L Spatial Statistics
- GEOG 4570/4570L Advanced GIScience

- GEOG 4571/4571L/4571E GIScience for Health and Environment
- GEOG 4590/4590L/4590E Programming for GIScience
- GEOG 4591 Introduction to GeoAI
- GEOG 4592 Advanced GeoAI
- GEOG 4593 Geospatial Semantics and Geo-Text Mining
- GEOG 4595/4595L Introduction to Machine Learning with Geospatial Data
- GEOG 4610 Location Analysis
- GEOG 4636 Maps and the City

26. Provide a curriculum map that aligns the program learning outcomes to the courses within the major (excluding Core IMPACTS and general electives). Specify if courses are required or elective.

The existing 1-credit capstone course, GEOG/ATSC 3910 has four learning outcomes, and the faculty believe eight outcomes for the Geospatial Data Science major map to these four more general outcomes. Also, most of the geospatial anchor courses include end-of-semester projects that align with the Geospatial Data Science Learning Outcomes, and these are mapped below. In this way, the capstone project is a final check, but the eight learning outcomes will be continually assessed as students complete their 3000x or higher anchor courses.

Four GEOG/ATSC 3910 Capstone Learning Outcomes mapped to the eight Geospatial Data Science Learning Outcomes listed in D. 24. are as follows.

1) Communicate geographic information using written, oral, graphical, and quantitative means [6];
2) Apply a geographical perspective and/or methods to describe, explain, and analyze the interconnections between human activities and the environment at varying spatial and temporal scales [1, 3, and 5];
3) Implement a holistic problem-solving approach to conduct geographic research [1, 2, 4, 5 and 7]; and
4) Use geographic skills to address problems and possible solutions to present-day concerns [8].

Curriculum Map Aligning Geospatial Data Science Learning Outcomes to Courses Within the Major
(Learning Outcomes listed in D.24)
(1=some emphasis, 2=moderate emphasis, 3=substantial emphasis)

Courses	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8
Required:								
GEOG/ATSC 3910								3
GEOG 4910	3	3	3	3	3	3	3	3
GEOG 2011/L,2011E	1	1	2	1				
GEOG 1140/L	1	1	1	1				
GEOG 3991 or 4960R	2	2	2	2	2	2	1	3
Elective Geospatial Anchor Courses (15 hours Required)								
GEOG 3510-3510L	1	1		1	1	2		
ATSC/GEOG 4100/4100L							1	
ATSC/GEOG 4140	1	1	1	1	1	1	1	
GEOG 4300	1	1	1	1	1	1	1	

GEOG 4330/4330L	1	1	1	1	1	1		3
GEOG 4350/4350L	1	1	1	1	1	1		3
GEOG 4370/4370L/4370E	1	1	1	1	1	1	1	
GEOG(CRSS) 4375	2	2	2	2	3	2		3
GEOG 4380/4380L	2	2	2	2	3	2	2	
GEOG 4385/4385L	2	2	2	2	2	2	2	3
ENGR(GEOG) 4390	3	2	1	3			3	3
ENGR(GEOG) 4395	3	2	1	3			3	3
GEOG 4410/4410L	2	2		2	2	3		3
GEOG 4430/4430L	2	2	2	2	3	2	3	3
GEOG 4450	2	2	2	2	3	2	3	3
GEOG 4460	2	3		2	3	2	3	3
GEOG 4470/4470L	2	3	2	3	3	3	3	
GEOG 4570/4570L	3	3	3	3	3	3	3	3
GEOG 4571/4571L/4571E	3	3	3	3	3	3	3	3
GEOG 4590/4590L/4590E	3	3	3	3	3		3	
GEOG 4591	2	2	2	2	2		3	
GEOG 4592	3	3	3	3	3		3	
GEOG 4593	3	3	3	3	3		3	
GEOG 4595/4595L	1	1	1	1	1		2	2
GEOG 4610	2	2	2	2	3	2	2	3
GEOG 4636	2	2	3	2	3	3		

27. Describe the assessment plan for program learning outcomes. You may also describe other aspects of the overall assessment plan that will be used for ongoing program reviews.

Each degree program is required to evaluate as part of a comprehensive program review process the effectiveness of its academic programs to address the quality, viability, and productivity of efforts in teaching and learning, scholarship, and service as appropriate to the institution's mission. The review should occur at least every 7 years for undergraduate programs and at least every 10 years for graduate programs. It should include both quantitative and qualitative data, including assessments of students in the program as well as after they graduate, such as employment and placement rates, student or employer surveys, or other assessments of graduate outcomes. The plan must also describe how this data will be used.

If approved, the success and effectiveness of the Geospatial Data Science program will be reviewed in detail during Years 1 through 4, as well subsequent years to assess teaching efforts, alignment with learning

outcomes, experiential learning and community service. Grades in Gen Ed Core I. Build a Foundation and II. The Cornerstone Curriculum courses, and all elective courses will be assessed. Completion of competencies in courses that are ungraded will also provide student reflections and feedback. If there is attrition from the program, the faculty will seek information on the reasons for shifting majors or leaving UGA. The placement of students in internships and faculty-mentored research, as well as supervisor evaluations, will indicate program effectiveness. The quality of capstone group projects and assessment of Learning Outcomes will be reviewed by the faculty instructors, the Director of all Geography degrees and the newly hired Undergraduate Programs and Industry Engagement Coordinator of the proposed program. Exit interviews with students graduating with a degree in the new major will provide qualitative data on its effectiveness and all alumni will be followed to determine the type, quality and location of graduates who enter geospatial careers. The faculty will conduct interviews with the employers of graduates and track acceptance into graduate programs. Students receiving honors and awards from the Geography Department, Franklin College of Arts and Sciences and professional societies will be documented. These data will be compiled and analyzed by the Geography Program Director, and reported annually to the Geography Department administration, staff and faculty, as well as administrators of UGA Franklin College of Arts and Sciences, and other colleges and schools related to courses students are taking to fulfill the requirement of geospatial courses outside of Geography.

28. Using data from O*-Net, identify at least three technical skills and three Knowledge, Skills and Abilities (KSAs) associated with the primary SOC Code/Occupation. Choose ones that are more specific, appropriate, and important to the occupation (e.g., quality control analysis) and not general skills (e.g., reading comprehension). How will this program address those career skills? Specify courses and activities that will help students develop these career skills.

Primary SOC Code:

1. **Geographic Information Systems Technologists and Technicians (15-1299.02)**

Technology Skills and KSAs	Courses and Activities
T1. Geographic Information System software, systems	Geography courses such as GEOG 1140/L Our Digital Earth, GEOG 2011/L or 2011E Maps, Data, and Society/Lab, GEOG 3510-3510L Cartography and Graphics, GEOG 4370/4370L/4370E Geographic Information Science, GEOG 4385/4385L Community GIS, GEOG 4410/4410L Geovisualization and Data Visualization, GEOG 4571/4571L/4571E GIScience for Health and Environment, GEOG 4470/4470L Spatial Statistics, GEOG(CRSS) 4375 GIS Applications in Agriculture, GEOG 4380/4380L Transportation Modeling and GIS. The majority of Geography techniques courses require students to conduct individual and group projects using GIS software and analyses. The degree also requires a 1-hour Capstone in Geography course and 3 hours of internship or faculty-mentored research in geospatial geography course using GIS. There are many electives in other departments, colleges and schools such as GEOL 4530/4530L Principles and Environmental Applications of GIS, FANR 3800 Spatial Analysis of Natural Resources, FANR 4201 Spatial Analysis for Integrative Natural Resource Problem Solving, FANR 5620 GIS Applications for Natural Resources, CRSS 4050 Improving Nutrient and Energy Efficiency with Geographic Information Systems, ENGR 3120 Spatial Data Analysis, ENGR 5930 GPS with Engineering and GIS Applications, ENVE 4710 GIS for Urban

	Engineering, Planning, and Development, EDES 4270 Environmental Design Uses of Geographic Information Systems, just to name a few.
T2. Database user interface and query software	Geography courses such as GEOG 4300 Data Science in Geography, GEOG 4470/4470L Spatial Statistics. Also, electives in Statistics and Computer Science such as: CSCI 3360 Data Science I, CSCI 4360 Data Science II, CSCI 4380 Data Mining, CSCI 4370 Data Base Management, MIST 5730 Advanced Data Management.
T3. Development environment software	GEOG 4590/4590L/4590E Programming for GIScience, ATSC/GEOG 4100/4100L Programming for Atmospheric Scientists, GEOG 4593 Geospatial Semantics and Geo-Text Mining, GEOG 4591 Introduction to GeoAI, GEOG 4592 Advanced GeoAI, STAT 2360/2360L Programming and Data Literacy Using R/Lab, CSCI 4050 Software Engineering, CSCI 1300/1300L Introduction to Programming with Python/Lab, CSCI 1301/1301E Introduction to Computing and Programming, and STAT 2360/2360L Programming and Data Literacy Using R/Lab.
K1. **Geography** — Knowledge of principles and methods for describing the features of land, sea, and air masses, including their physical characteristics, locations, interrelationships, and distribution of plant, animal, and human life.	Courses designated to fulfill UGA's undergraduate The Cornerstone Curriculum in Area II.A, Explore the World satisfy this KSA including GEOG 1111/L Introduction to Physical Geography/Lab, GEOG 1112/L Introduction to Weather and Climate/Lab, GOEG 1113L Exploring Earth's Surface: Landforms and Environments/Lab, GEOG 2110/L Introduction to Physical Geography (Honors), GEOG 1140/L Our Digital Earth/Lab, or GEOG 2120H/L Introduction to Weather and Climate (Honors). In addition, electives such as GEOG 4330/4330L Aerial Photographs and Image Interpretation, GEOG 4350/4350L Remote Sensing of Environment, GEOG 4460 Field and Lab Methods in Remote Sensing. We also have numerous Atmospheric Science courses including ATSC(GEOG) 3110 Climatology, ATSC(GEOG) 3120/L Weather Analysis and Forecasting, ATSC(GEOG) 3130 Atmospheric Hazards ATSC(GEOG)(ENGR) 4112 Atmospheric Dynamics, ATSC 4114 Atmospheric Dynamics II, ATSC 4116/L Introduction to Data Assimilation, ATSC(GEOG) 4120 Synoptic Meteorology and Climatology, ATSC(GEOG) 4121 Weather Forecasting Seminar, ATSC(GEOG) 4150 Physical Climatology ATSC(GEOG) 4160 Applied Climatology in the Urban Environment ATSC(GEOG) 4170/L Mesoscale and Radar Meteorology and Climatology. Many of our Physical and Environmental courses address this knowledge area such as GEOG 3290 Mountain Geography, GEOG(PBIO) 4220 Ecological Biogeography, GEOG(PBIO) 4240 Plant Geography, GEOG 4290 Geography and Ethnoecology of Neotropical Mountains, GEOG 3010 General Geomorphology, GEOG 4020 Fluvial Geomorphology, GEOG 4030 Human-Environment Dynamics in Arid Landscapes, GEOG 4040 Global Environmental Change Past and Present. Courses on climate change include GEOG 3180 Global Climate Change: Causes and Consequences, GEOG 3185 Climate Change Solutions and GEOG 4040 Global Environmental Change Past and Present. Electives in other departments, colleges and schools address this KSA: ECOL 3960 Applied Ecological Data Science, ECOL 4450 Spatial Ecology, FANR 3800 Spatial Analysis of Natural Resources,

	FANR 4201 Spatial Analysis for Integrative Natural Resource Problem Solving, FANR 5620 GIS Applications for Natural Resources, FANR 5640 Unmanned Aerial Systems in Natural Resources, FORS 5650 Aerial Photogrammetry in Forestry, GEOL 4270 Geology Field School (Required for B.S. in Geology), CRSS(GEOL) 4540/L Pedology, GEOL 4640 Geochemical and Geophysical Surveys, GEOL 4660 Shallow Geophysics, GEOL 4700 Archaeological Geology, WASR(CRSS)(ECOL)(ENGR)(GEOG)(GEOL) 4700/L Hydrology, Geology, and Soils of Georgia. MARS 4500 Field Study in Oceanography and Marine Methods, MARS 4520 Quantitative Analysis of Ocean Data MARS 4800 Regional Oceanography of the South Atlantic Bight MARS 4600 Field Experiences in Coastal Georgia.
K2. **Computers and Electronics** — Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.	All of the courses listed in T3 Development environment software address this KSA. Also, courses and undergraduate research experience in the UGA Small Satellite Research Laboratory where students design, build and implement nanosatellites (i.e., CubeSats): ENGR(GEOG) 4390 CubeSats: Design, Integration, and Testing for Remote Sensing Satellites, ENGR(GEOG) 4395 CubeSats II: Assembly, Integration, and Testing. Also, FANR 5640 Unmanned Aerial Systems in Natural Resources and new courses being developed in drone-AI integration by new faculty in Geography.
K3. **Mathematics** — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.	The degree requires students take courses that meet Gen Ed Core requirements of I. Build a Foundation in Mathematical and Quantitative Reasoning, including GEOG 2011/L or 2011E Maps, Data, and Society/Lab, GEOG 1140/L Our Digital Earth, STAT 2000, or 2000E Introductory Statistics, 2100H Introduction to Statistics and Computing (Honors), STAT 2010 Statistical Methods for Data Scientists, CSCI 1300/L Introduction to Programming with Python/Lab, CSCI 1301/1301E Introduction to Computing and Programming, STAT 2360/L Programming and Data Literacy Using R/Lab. Most of our Geography techniques courses listed for T1 GIScience (especially GEOG 4300 Data Science in Geography and 4470/L Spatial Statistics) fulfill this KSA, as well as courses in Statistics, Computer Science and Data Science: STAT 4240 Sampling and Survey Methods (qualitative data analysis), STAT 4260 Statistical Quality Assurance, STAT 4280 Applied Time Series Analysis, STAT 4290 Nonparametric Methods, STAT 4365 Modern Statistical Programming (uses R and Python), and STAT 4620 Applied Categorical Data Analysis.
S1. **Complex Problem Solving** — Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.	Virtually all of our Geography courses in the Geospatial Anchor, Physical and Environmental Geography, Atmospheric Sciences, and Geography and Society domains identify complex problems and provide content for students to develop and evaluate solutions. Many of our courses consist of two lecture sessions and one lab per week. Students build on lecture content and activities to conduct lab exercises that employ materials, data, maps, group activities, field data collection, field trips, library resources, etc. to apply concepts and theory to applications and real-world problems. Climate solutions courses listed in K2, as well as many of our Geography urban, race political ecology and other society courses, address complex problem solving. Examples are GEOG 3630 Introduction to Urban Geography, 4630 Advanced Urban Geography, GEOG 3620 Globalization and the Making of the Modern World, GEOG 3640 The Geography of Human Rights, GEOG 3690 Introduction to Political Geography and GEOG 4631 Race, Inequality, and the American City, just to name a few. A complete list is provided in Appendix A.

S2. **Judgment and Decision Making** — Considering the relative costs and benefits of potential actions to choose the most appropriate one.	The curriculum for the Geospatial Data Science degree includes courses in the Geospatial Anchor domain that introduce students to geospatial modeling. Students learn to search for geospatial datasets that are appropriate for the geographic and temporal scale of environmental or social issues, manage large data volumes, analyze spatial temporal patterns and combine data layers to identify areas of risk or suitability. These geospatial models are used to assess the outcomes of potential actions and parameters can be adjusted to determine optimal results or compare methodologies and approaches.
S3. **Social Perceptiveness** — Being aware of others' reactions and understanding why they react as they do.	Students majoring in Geospatial Data Science are required to take credit hours that fulfill UGA's new Gen Ed Core II. The Cornerstone Curriculum, Explore the Human Experience (II.A. 3) and Explore Human Connections (II.B.6). These courses include GEOG 2010H Introduction to Human Geography, GEOG 1101 Human Geography: People, Places and Cultures and GEOG 1125 Resources, Society and Environment. Several Geospatial Anchor courses cover Mixed Methods approaches that combine quantitative and qualitative data. For example, GEOG 4385/L Community GIS is a designated Service-Learning course that involves students in Participatory GIS for outreach to our city and surrounding counties. In addition, at least 6 hours of courses at the 3xxx level or above are required to be Non-anchor Geography courses listed in Appendix A as Geography and Society courses that explore issues such as race, inequality, political ecology, urban geography, climate justice, and many more.
A1. **Deductive Reasoning** — The ability to apply general rules to specific problems to produce answers that make sense.	The majority of required and elective courses in Geography that will be part of the Geospatial Data Science curriculum apply deductive reasoning by mastering concepts such as scale, data quality, ontology, thematic completeness and ethics to problems in environmental justice, climate change, urban/rural development and human-environment interactions.
A2.**Inductive Reasoning** — The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).	Inductive reasoning is fundamental to Geospatial Anchor courses that incorporate principles of data mining, regression and neural network statistics, geospatial modeling and GeoAI. For example, GEOG 4591 Introduction to GeoAI, GEOG 4592 Advanced GeoAI, and GEOG 4593 Geospatial Semantics and Geo-Text Mining integrate GIScience with artificial intelligence and computer vision techniques for spatial analysis. They apply deep learning and machine learning (DL/ML) methods to train and create complex models exploring the relationships among input variables. Several other courses incorporate DL/ML methods for environmental predictions such as GEOG 4330/L Aerial Photographs and Image Interpretation, GEOG 4350/L Remote Sensing of Environment, GEOG 4380/L Transportation Modeling and GIS, GEOG 4430/L Advanced Image Analysis and Photogrammetry, GEOG 4570/L Advanced GIScience, GEOG 4571/L GIScience for Health and Environment, and GEOG 4595/L Introduction to Machine Learning with Geospatial Data.
A3. **Oral and Comprehension** — The ability to listen to and understand information and ideas presented through spoken words and sentences. The ability to read and understand information and ideas presented in writing.	Virtually all of our Geography courses in the Geospatial Anchor, Physical and Environmental Geography, Atmospheric Sciences, and Geography and Society domains have learning environments that consist of lectures by instructors and guest lecturers, as well as films and active learning exercises that engage students in oral communication, group discussion and individual oral presentation of project results. Readings are regularly assigned with oral discussion and written responses to thought questions posed by the instructor and fellow students. Many of the faculty who will teach Geospatial Data Science courses in Geography and other departments, colleges, and schools are using active learning pedagogy that is a constructivist approach engaging students in collaborative discussion, problem solving, and reflection. Increased student participation in learning

	results in a more meaningful classroom experience, understanding, and the ability to apply knowledge to real-world situations. UGA support for teaching is readily available through the Center for Teaching and Learning.

29. Which High Impact Practices[7] (HIPs) will faculty embed into the program? Mark all that apply.

High Impact Practice	Program Requirement	Program Elective
Capstone Courses and Projects	GEOG 4910 (1 hour) Capstone in Geography	
Collaborative Assignments and Projects	The majority of Geography techniques courses listed in T1, GISience and K1 Geography require students to conduct collaborative assignments and individual or group projects applying the learned concepts and theory to real-world problems. This is especially true in courses that have a laboratory component in addition to lecture sessions.	
Common Intellectual Experiences	Our required Geography courses listed in The Cornerstone Curriculum, Area II.A Explore the World, especially A.II.3 Explore the **Human Experience** (e.g., GEOG 2010H Introduction to Human Geography, GEOG 1101, 1101E Human Geography: People, Places and Cultures) or GEOG 1125 Resources, Society and Environment **and II.B Explore the Human Connections** (e.g., GEOG 1130 Introduction to World Geography) provide Common Intellectual Experiences with shared works from diverse historical, cultural and geographical contexts. They explore questions about people, places, beliefs and cultures.	
Study Abroad/Study Away/Global Learning		Electives in this new degree are: GEOG(INTL)(HIST) 4634 Paris and Modernity Study Abroad CVLE 4775 Advanced Survey Methods using Drones Study Abroad at Oxford
ePortfolios		Students create an ePortfolio of their Capstone project in GEOG 4910. Elective Geospatial Anchor courses also typically involve students collecting geospatial data, performing analyses and creating traditional 2D maps as well as

[7] See Kuh (2008). High-Impact Practices: What They Are, Who Has Access to Them, and Why They Matter. *Association of American Colleges and Universities*, *14*(3), 28-29).

		geovisualizations in 3D and 4D time animations. Students create ePortfolios of lab exercises and project outcomes in courses such as GEOG 3510/L Cartography and Graphics, GEOG 4330 Aerial Photographs and Image Interpretation, GEOG 4350 Remote Sensing of Environment, GEOG 4370/L GIScience, GEOG 4385 Community GIS, and GEOG 4636 Maps and the City.
First-Year Seminars and Experiences	UGA requires all First-Year students to take a 1-credit hour First-Year Odyssey (FYO) course. Many of our Geography faculty regularly teach FYO courses.	
Internships, Work Based Learning	At least 3 hours of Internship such as GEOG 3991 Internship in Geospatial Data Science (new), or GEOG 3990 Internship in Geography (with permission if it has a geospatial emphasis) is required. Alternatively, students may take a faculty-mentored research course (GEOG 4960R, 4970R or 4980R) that provides work-based learning. Geospatial Anchor course, GEOG 4385/L Community GIS is a Service Learning course with outreach to the local community. One of our faculty members is a Clinical Professor in Community Geography and serves as the Undergraduate Internship Coordinator. We also plan to hire an Undergraduate Programs and Industry Engagement Coordinator who will connect students and faculty with industry partners to promote internship and job opportunities.	
Learning Communities		Learning Communities are formed in the Geospatial Data Science curriculum when students self-select subdomains within the Geospatial Anchor, and Non-Geospatial Anchor elective courses, as well as courses outside of Geography in other departments, colleges and schools. Taking a sequence of courses such as Intro and Advanced versions of

		GIScience, remote sensing, GeoAI, geovisualization, community GIS, for example, creates a student cohort who can learn from one another and share experiences. They will also be encouraged to become members of the Geography Undergraduate Student Organization (GUSTO) and student members of professional societies such as the American Association of Geographers and join UGA Student Chapters of the American Meteorological Society and American Society for Photogrammetry and Remote Sensing.
Service Learning, Community Based Learning		Many of the electives in this degree program are designated Service and Community Based Learning courses such as, GEOG 4385/4385L Community GIS, and GEOG 3660 Geography of Food Commodities,
Undergraduate Research	At least 3 hours of internship or faculty-mentored research are required. Courses include GEOG 3991 (new) Internship in Geospatial Data Science or GEOG 3990 Internship in Geography (with permission to approve a geospatial-related internship), GEOG 4921 Special Problems in Area Analysis, or GEOG 4760R, 4970R, 4980R, 4980H Faculty-Mentored Undergraduate Research I, II and III	
Writing-Intensive Courses	The majority of Geography courses listed in The Cornerstone Curriculum, Area II.A Explore the World, especially II.A.3 Explore the **Human Experience** (e.g., GEOG 2010H Introduction to Human Geography, GEOG 1101, 1101E Human Geography: People, Places and Cultures or GEOG 1125 Resources, Society and Environment) **and II.B Explore the Human Connections** (e.g., GEOG 1130 Introduction to World Geography, GEOG 1101 Human Geography: People, Places and Cultures) are writing-intensive courses with essays and written responses	

	to thought-provoking issues. Additionally, virtually all of the geospatial techniques courses that include individual and group projects require written final reports.	

For each of the HIPs selected above, give specific examples of activities and/or assignments and when students will be expected to engage in them.
(i.e. "Students will be required to participate in an externship during their third year of enrollment, in order to develop skills in… etc.").

30. Will other innovative pedagogies in the curriculum be used to make this program attract students and help them succeed (e.g., problem-based learning)? Provide specific examples of activities associated to these pedagogies.

Many Geography faculty are incorporating active learning strategies in their course instruction and taking advantage of materials and information provided by the UGA Center for Teaching and Learning (CTL) (Center for Teaching & Learning - UGA Office of Instruction). Emphasizing a student-centered approach to learning, the CTL supports faculty in developing active learning pedagogies, assessing the impact of active learning on student engagement in the classroom, providing flexible active learning approaches and enhancing classroom/materials (Active Learning at the University of Georgia), Several faculty members regularly attend UGA's annual Active Learning Summit held on campus, and the CTL Active Learning Workshop Series, and are working toward obtaining UGA's Active Learning Leader Certificate. Faculty also have been selected for the CTL Course Redesign Experience. In addition, several faculty members have transitioned from traditional grading to ungrading, an educational approach that replaces assigned points and letter grades with feedback, reflection and aligning student growth with course learning goals.

31. Provide a sample program map demonstrating how students will progress through the curriculum (e.g., first semester courses).

Questions to guide the development of this map:
- *Is it doable within the standard time expected for the degree (e.g., four years for a bachelor's degree)?*
- *What is the average number of credits a student at your institution takes?*
- *Are prerequisite/corequisite courses scheduled before/at the same time?*
- *Are there courses that should or should not be taken together?*
- *Are you placing courses in a semester in which the institution is planning be offered? Discuss potential offerings with department chair*

4 YEAR/8 SEMESTER EXAMPLE COURSE SCHEDULE GEOSPATIAL DATA SCIENCE (B.S.)
Total Credits in this Example = 125 *(Required and Elective)*

	Fall Semester	**Credit Hours**	**Spring Semester**	**Credit Hours**
First Year	ENGL 1101 MATH 1113 GEOG 1111, 2110H *(Intro to Physical Geography)*, 1112 (*Intro to Weather and Climate)* or 1113 *(Exploring Earth's Surface)*	3 3 3 1	ENGL 1102 STATS 2000 GEOG 1140 *(Our Digital Earth)* GEOG 1140L FANR(ECOL)(GEOG) 1200 *(Natural History of Georgia or other Science of Living Things course)*	3 4 3 1 3

	GEOG 1111L, 1112L or 1113L *(Lab)* GEOG 1125 *(Resources, Society, and Environment)* FYOS 1001 *(First-Year Odyssey)* Total Hours:	3 1 14	Explore the Reasoning Behind Ethical Decisions course Total Hours:	3 17
Second Year	GEOG 1101, 1101E or 2010H *(Human Geography)* GEOG 2011, 2011L *(Maps, Data, and Society)* GEOG 1130 *(Intro to World Geography)* Computer programing (e.g., CSCI 1300, 1301 or STAT 2360) Explore Social Connections course Total Hours:	3 3 3 4 3 16	GEOG 1111, 2110H *(Intro to Physical Geography)*, 1112 (*Intro to Weather and Climate)* or 1113 *(Exploring Earth's Surface)* GEOG 1111L, 1112L or 1113L GEOG 4385 *(Community GIS Service Learning)* GEOG 4370/4370L *(Intro to GIScience)* POLS 1101, 1101E or 1105H *(American Government)* Explore Social Connections course Total Hours:	3 1 3 3 3 3 16
Third Year	Geospatial Anchor course such as: GEOG 4300 *(Data Science in Geography)* GEOG 4370/4730L *(Intro to GIScience)* GEOG 4330/4330L *(Aerial Photographs)* One GEOG or ATSC Non-Anchor course: (e.g., GEOG 3630 *(Intro to Urban Geography)* One Non-Geography geospatial course: ECOL 4450/4450L *(Spatial Ecology)* Total Hours:	 3 3 3 3 3 15	Geospatial Anchor courses such as: GEOG 4590/4590L *(Programming for GIScience)* GEOG 4410/4410L *(Geovisualization)* GEOG 4380/4380L *(Transportation Modeling)* One Non-Anchor course: ATSC/GEOG 3100 *(Climatology)* One Non-Geography geospatial course: GEOL 4530/4530L *(Principles and Environmental Applications of GIS)* Total Hours:	 3 3 3 3 3 15
Fourth Year	Geospatial Anchor courses: GEOG 4591 *(Intro GeoAI)*	 3	Geospatial Anchor courses: GEOG 4592 *(Adv GeoAI)*	 3

	GEOG 4460 *(Field Lab Methods in Remote Sensing)*	3	GEOG 4570/4570L *(Adv GIScience)*	3
	GEOG 4350/4350L *(Remote Sensing)*	3	GEOG 4571/4571L *(GIScience for Health and Environment)*	3
	GEOG 4470/4470L *(Spatial Statistics)*	3	GEOG 4636 *(Maps and the City)*	3
	Internship or research course: GEOG 3991 or GEOG 4960R	3	GEOG 4610 *(Location Analysis)*	3
	Capstone course: GEOG(ATSC) 3910	1	Professional development course: GEOG(ATSC) 4910	1
	Total Hours:	16	Total Hours:	16

32. What monitoring strategies and resources will you employ to ensure students, both traditional and non-traditional, will progress? (e.g., strategies for bottleneck courses, intrusive advising, supplemental instruction, tutoring, etc.)

    The design of this curriculum is extremely flexible to accommodate students' interests. Courses can be customized for specializations within Geospatial Anchor course such as geospatial analysis, GeoAI, remote sensing, geovisualization, community GIS, resource management and urban-rural planning. The foundational Geospatial Anchor courses are offered regularly in the Fall semester and follow-on advanced courses in the Spring semester. A newly hired Undergraduate Programs and Industry Engagement Coordinator will be responsible for supporting the operations of our three undergraduate degrees and monitor enrollment, retention, internship participation, experiential-learning opportunities, alumni success and placement of our graduates. In this way, adjustments can be made to the program, and information gathered for long-term strategies. They will alert the Geography Program Director if individual students are not progressing through the major. In turn, they will contact faculty who are teaching courses that are problematic for both traditional and non-traditional students to encourage increased student-faculty communication, meetings during office hours, accommodations, and/or opportunities for tutoring or supplemental instruction. This is especially important because the proposed major requires 6 hours of coursework to be taken outside of the Geography Department and extra coordination with other UGA departments, colleges and schools will be necessary ensure student success.

33. Prior Experiences.

    a. How many credits can students transfer in from other institutions, beyond general education?

    The Geography Programs Director and Undergraduate Coordinator will consider up to 6 credits of similar geospatial course credit at 3xxx-level or above to be transferred from other institutions.

    b. Will there be opportunities for credit for prior learning, beyond general education? If yes, please explain.

    Prior Learning is an umbrella term that includes things like credit by examination (e.g., AP, CLEP, DANTES) and credit earned through portfolio assessment for non-academic work such as work experience or microcredentials. eCampus *and* Georgia Southern *have great webpages that describe these options.*

    No

34. Will the program offer courses from any USG collaboratives?

Mark all that apply. Provide a letter of support from applicable initiatives' leadership if your institution is not already part of the selected Collaboratives' MOU.

☒ None
☐ eCore
☐ eMajor Programs/Courses
☐ USG Goes Global
☐ FinTech
☐ Georgia Film Academy
☐ Other: Specify Collaborative Here

35. Explain how the design of the curriculum was informed by talking with employers or community representatives (e.g. meeting a persistent, new, or emerging demand for career-related knowledge, skills, and abilities).

The design of the B.S. in Geospatial Data Science curriculum was informed through extensive engagement with stakeholders across academia, industry, government, alumni, and the broader UGA community. Faculty within the Department of Geography, led by Department Head Dr. Deepak Mishra, held discussions with employers, research collaborators, government agencies, private-sector geospatial companies, alumni, and current students to better understand the evolving knowledge, skills, and abilities required of graduates entering the modern geospatial workforce. These conversations consistently highlighted the growing demand for graduates with expertise in geospatial data collection, GIS, remote sensing, drone technologies, spatial analytics, programming, cloud computing, and artificial intelligence.

The curriculum development process also included a review of comparable programs at peer and aspirational institutions to identify emerging trends in geospatial education and ensure that the proposed degree reflects current best practices. Attention was given to the increasing integration of data science, machine learning, and GeoAI into geospatial curricula.

Within UGA, the Department consulted with faculty and leadership across multiple colleges and schools whose students routinely use geospatial technologies, including units in crop & soil sciences, forestry and natural resources, statistics, computer science, geology, marine sciences, ecology, engineering, urban planning, and related disciplines. These discussions reinforced the need for a program that complements, rather than duplicates, existing degree offerings. Another need was to provide students with a strong computational and analytical foundation in GIScience. Close collaboration with the Departments of Statistics, the School of Computing and the Institute of Artificial Intelligence also informed the inclusion of coursework that prepares students for data-intensive geospatial careers.

Feedback from these stakeholders demonstrated a persistent and growing workforce demand for professionals who can integrate geospatial technologies with data science and artificial intelligence to solve real-world problems. As a result, the curriculum emphasizes technical proficiency in GIScience, programming, statistics, remote sensing, drone-based data acquisition, spatial data management, and GeoAI, while maintaining the interdisciplinary perspective needed to prepare graduates for careers in industry, government, research, and graduate education.

E. IMPLEMENTATIONH36. ADMISSIONS REQUIREMENTS.

a. Will there be any program-specific admission requirements, beyond the institution's minimum requirements? Please specify. (If none, skip to #37.)

None

b. Are there any required courses a student must complete for program admission?

None

c. Will there be competitive program admissions, where students who meet all requirements may not be admitted into the program? Please explain.

For bachelor's degrees, please also describe what program these students will pursue until they are admitted into this proposed program so that they can receive federal financial aid.

No

37. Interaction with other program offerings:

a. If applicable, what off-ramp programs exist for students who are not successful, either at program admission or during the program?

(e.g., students who are not successful into a Bachelor of Science in Nursing may be advised to go to a Bachelor of Science in Health Science where the prerequisite nursing courses will still count)

Students may be eligible to pursue a Geography (B.S.) degree. Students who are not successful in obtaining a B.S. degree in Geospatial Data Science, but who are still interested in pursuing a credential will be advised to pursue the Undergraduate Certificate in Geographic Information Science.

b. Is there opportunity to leverage other programs at your institution to bolster enrollment in this program?

(e.g., a program at a lower degree level, a program where this may serve as an off-ramp, or a potential dual degree)

Yes, to bolster enrollment in this proposed B.S. in Geospatial Data Science, the faculty will leverage the success of the Undergraduate Certificate in Geospatial Information Science. Many students in other departments, colleges and schools obtain this certificate and since 2015 there has been a steady increase in the number of certificates awarded. In 2023, there were 76 enrolled undergraduates and this year in 2026, there are 112 (see Figure 1). The faculty believe students seeking the Certificate in Geospatial Information Science will also be interested in obtaining the new Geospatial Data Science (B.S.) degree.

c. Is there opportunity to leverage programs at other institutions to bolster enrollment in this program?

In the future, the department may leverage the Environmental Spatial Analysis (ESA) B.S. degree and the undergraduate GIScience Certificate and Geospatial Intelligence Certificate programs on the Gainesville Campus of the University of North Georgia. The ESA degree's curriculum is built on a foundation of GIS and supported courses in remote sensing and information technology, along with the GIScience Certificate. The Geospatial Intelligence Certificate Program is accredited by the U.S. Geospatial Intelligence Foundation and leverages geospatial science and technology with intelligence tools to develop skills that inform decisions in disaster response, humanitarian relief and national security. The faculty have had discussions with faculty from UNG who are involved in these programs about opportunities, especially for local students who would like to transfer from UNG to UGA in their third year, to obtain the Geospatial Data Science degree. Since UGA does not currently offer an Undergraduate Certificate in Geospatial Intelligence, this could be a reciprocal opportunity for our undergraduates.

38. Enrollment Projections.

In the budget spreadsheet, you will be required to make enrollment projections in the "Enrollment & Tuition Revenue" tab. In this section, please provide narratives to support those projections.

	Year 1 2027-2028	*Year 2 2028-2029*	*Year 3 2029-2030*	*Year 4 2030-2031*
Base Enrollment*	*----*	*30*	*52*	*70*
Lost to Attrition (Should be negative)	*----*	*3*	*5*	*7*
New to Institution	*5*	*10*	*13*	*15*
Shifted from Other Programs within Institution	*25*	*15*	*10*	*5*
Total Enrollment	*30*	*52*	*70*	*83*
Graduates	*0*	*0*	*0*	*30*
Carry forward base enrollment for next year	*30*	*52*	*70*	*53*

**Total enrollment for year 1 becomes the base enrollment for year 2.*

a. Discuss the assumptions informing your enrollment estimates.

(i.e. for example, you may highlight anticipated recruiting targets and markets, if and how program implementation will shift enrollment from other programs at the institution, etc.)

The faculty assume there will be a progression of new majors in Geospatial Data Science from 5 in Year 1 to 10, 13, and 15 by Year 4. The faculty also assume there will be shifts from other programs both within and outside of the Geography Department of 25 in the first year to 15, 10, and 5 in subsequent years. Thus, total anticipated enrollments in this degree program are 30, 52, 70, and 83 in the first four years. These enrollments also estimate a loss to attrition of 3, 5 and 7, students in Years 2, 3, and 4.

b. If projecting a shift from other programs, discuss the potential impact on those programs.

(e.g., course scheduling, faculty/staff resources, etc.)

Based on a townhall meeting which was conducted in Spring 2026 semester in Geography with undergraduate students currently majoring in Geography and Atmospheric Science, the faculty project many of the shifts in major to be from Geography to Geospatial Data Science, with some being double majors. Atmospheric Science students are expected to obtain the GIScience Certificate. The faculty also anticipate Geography students who focus on Physical and Environmental Geography, and Geography and Society courses may also be interested in adding this new major.

c. If projections are significantly different from enrollment growth for the institution overall, please explain. Include overall institutional enrollment growth at the undergraduate or graduate level (depending on the proposed program) for the past 3 years by comparison.

N/A

d. If projected program enrollment is not realized in year two, what actions are you prepared to take? This should include measures beyond additional marketing.

If the projected enrollment is not realized in Year 2, the faculty will increase the visibility of the program through recruitment in Georgia high schools, especially in counties in and surrounding the City of Atlanta. The faculty will also target recruitment of transfer students, especially from the University of North Georgia. The faculty will also increase the content about the new degree and potential geospatial careers on the Geography website and social media outlets of Facebook, Instagram and LinkedIn. Expected connections with industry partners made by the new Undergraduate Programs and Industry Engagement Coordinator should enhance program enrollment by adding opportunities for internships and career placement that can be highlighted on our social media platforms. However, the faculty do not expect enrollment to be low based on estimates of the growth and demand of geospatial careers.

39. Discuss the marketing and recruitment plan for the program. This should go beyond general marketing/recruitment strategies by your institution. What resources have been budgeted for marketing the new program?

The Geography Department is prepared to market the new degree on the department website and social media outlets. The faculty are very engaged with professional societies and collaborative research activities that provide outlets for recruitment and marketing. Jobs in Geography are discussed in all of Introductory sections with FY 25-26 enrollments of 1,498 students in GEOG 1101, Human Geography: People, Places and Cultures; 1,397 students in GEOG 1,130 Introduction to World Geography; 1,099 students in GEOG 1111, Introduction to Physical Geography; and 1,032 students in GEOG 1112, Introduction to Weather and Climate. The department also typically has maximum enrollment in GEOG 4370/6370-4370L/6370L, Geographic Information Science, each fall and spring semester (for a total of 58 in FY 25-26), with many students coming from outside of Geography. There are several faculty members who incorporate GeoAI in their courses and a new faculty hire will hold a joint position in Geography and the Institute of Artificial Intelligence. Another new Clinical Faculty member specializes in remote sensing, web mapping and drone data collection, processing and applications. They will be developing new courses focused on drone data and analysis that will integrate GeoAI and edge computing with a variety of sensors mounted on drones. Our new introductory geospatial course, GEOG 1140, Our Digital Earth, developed this year by last year's GeoAI hire, is required for this new major. The faculty hope this course will see super-section enrollment, attract First-Year students and introduce large numbers of students to the Geospatial Data Science major. Another recent hire is an Assistant Clinical Professor in Community Geography and Outreach who heads our Geography Internship Program and teaches GEOG 2011 and 2011L, Maps, Data and Society, an alternative required introductory course for this new major. This course also consistently has maximum enrollment (101 in FY 25-26). The connection of our faculty with UGA students and community internship opportunities, along with the Director of the UGA Community GIS Lab, Associate Professor and Undergraduate Coordinator's involvement in the surrounding community, are expected to be additional avenues for marketing and recruitment.

F. RESOURCES

F1. Finance: Submit the Excel budget forms and the questions below.

(Do not cut and paste in the excel budget template into this document, submit the Excel budget templates separately.)

40. Are you requesting a differential tuition rate for this program? (*masters, doctoral, and professional programs only, or other BOR Approved differential tuition rates such as collaboratives*)

☒ No *(Move to answer question 41)*

☐ Yes *(If yes, answer questions 40a & 40b)*

a. What is the differential rate being requested? The rate below should reflect the core tuition plus the differential, i.e. the tuition rate being advertised to the student.

In-State per Semester:
Out-of-State per Semester:

b. Provide tuition and mandatory fee rates assessed by competitive/peer programs per full-time student per semester. Please complete the table below.

(Competitive/Peer programs are determined by the institution and may include institutions within or outside of Georgia.)

41. Are there any additional financial costs, beyond tuition and mandatory institution fees, that students will have to take on as part of this program? If so, please describe these costs, benefits to the students, and what strategies you have considered to decrease the student's financial burden?

    a. Program fees

    N/A

    b. Course fees

    N/A

    c. Other fees (e.g., clinical insurance)

    N/A

    d. Costs not assessed directly by the institution (e.g. software licenses, equipment, travel, etc.)

    N/A

42. Reallocation of Existing Funds.

    a. If existing funds from programs/services across the institution are being reallocated, describe the impact and mitigation strategies.

    N/A

    b. If enrollment projections included shifts from other majors, the financial impact on those majors and mitigation plan should be addressed here.

    Projected enrollment shifts from the B.S. degree in Geography are not expected to negatively impact the department's enrollment numbers because the B.S. degree in Geospatial Data Science will be counted as Geography enrollment. In addition, the new degree is expected to attract new majors to Geography in the students' first and second years. Currently, the majority of Geography majors do not declare this major until they have taken introductory courses and "discovered" geography. Given the great potential for qualifying for a number of different types of jobs and careers, the believe this major will be attractive to students who are applying to UGA.

43. How does the institution plan for and fund increased indirect costs associated with the growth in students anticipated in the proposed program over the first four years? Consider costs such as student advisement, student support services, tutoring, career services, additional library materials, technology, or other infrastructure.

    Once the proposed degree program is approved, the Department of Geography will administer four distinct, interdisciplinary bachelor's degree programs: Bachelor of Arts (A.B.) and Bachelor of Science (B.S.) in Geography, Atmospheric Sciences (B.S.), and Geospatial Data Science (B.S.). Together, these programs span economic and cultural geography, environmental and atmospheric sciences, geospatial technologies, data science, and geospatial artificial intelligence. These degrees prepare students for rapidly evolving careers across industry, government, and the nonprofit sector. The breadth and growing complexity of this undergraduate portfolio require dedicated coordination that extends beyond traditional academic program administration.

    The faculty propose hiring an Undergraduate Programs and Industry Engagement Coordinator who would provide integrated support for the four degree programs, by assisting the Undergraduate Coordinators,

Undergraduate Internship Coordinator, and the Atmospheric Sciences and Geography Program Directors. They will aim to build stronger connections among students, faculty, alumni, employers, and industry partners. The outward-facing position would provide assistance to coordinate undergraduate program operations, support student progression and retention, facilitate experiential learning, and maintain a consistent point of contact for external organizations interested in engaging with our students and programs. Additional duties include assisting with our Geography Undergraduate Student Organization (GUSTO) and Student Chapters of the American Meteorology Society (AMS) and American Society for Photogrammetry and Remote Sensing (ASPRS), and managing our spaces for students to study and informally gather.

A particularly important responsibility would be developing a more systematic industry engagement program. Geography, Atmospheric Sciences, and Geospatial Data Science students will benefit from sustained engagement with employers, including cultivating partnerships, developing internship pipelines, connecting students with professional opportunities, organizing employer and alumni engagement, and identifying opportunities for industry-supported projects. A dedicated coordinator would turn these activities from largely individual, episodic efforts into a sustained departmental strategy.

The position would also complement investments in student recruitment by strengthening the undergraduate experience after students join our program. Experiential learning, professional preparation, and successful career outcomes are as important as academics in building strong, competitive programs. The coordinator would assist the Undergraduate Internship Coordinator in strengthening student engagement, developing new internships, employer outreach, capstone industry clients, and related activities. Centralizing these functions would provide continuity across programs while allowing faculty to focus their effort where faculty expertise adds the greatest value.

This position therefore represents more than additional administrative capacity. It is a strategic investment in the full undergraduate student lifecycle, from recruitment and academic progression to experiential learning, graduation, and career placement. It would simultaneously strengthen the three undergraduate programs, improve student outcomes, support faculty, and expand the Department's engagement with corporate, governmental, nonprofit, and alumni partners.

The Undergraduate Programs and Industry Engagement Coordinator will work collaboratively with the Geography Programs Director, Undergraduate Coordinator, and Internship Coordinator. The Geography Programs Director and Undergraduate Coordinator will be selected from existing faculty and compensated through fixed annual administrative stipends, while the Internship Coordinator responsibilities will be incorporated into the already designated faculty member’s assigned FTE.Together, they will actively recruit students to the program through industry partnerships, ongoing national and international outreach, and involvement in professional societies. Because we anticipate increased interest by First Year students in the new degree program, the Geography Program Director will work with the Undergraduate Coordinator and Undergraduate Advisor to promote opportunities for students to consider a double major with Geography (A.B or B.S), incorporate any Advanced Placement credit and expand their Programs of Study. Because this new Geospatial Data Science degree is especially interdisciplinary and has complex requirements and optional electives, the Director will maintain current course lists and ensure courses needed for this new degree are offered regularly. They will work with Geography’s Undergraduate Advisor to provide scheduling information needed for advisement and developing students’ Programs of Study.

Success of the new degree program could be measured through clear outcomes, including enrollment and retention, internship participation, number of active employer and industry partnerships, experiential-learning opportunities, alumni engagement, and graduate career and educational outcomes. In this way, the Geography Programs Director and Undergraduate Programs and Industry Engagement Coordinator would provide both immediate operational value and long-term strategic benefit to the Department and College.

F2. Personnel and Workload

44. Discuss how existing courses may be incorporated into this new program:

a. Course Development

	Number
Total courses in the curriculum	26 Geospatial Anchor courses in Geography, 34 Non-Geospatial Anchor elective courses in Physical and Environmental Geography and Atmospheric Sciences, 27 Non-Geospatial Anchor elective courses in Geography and Society, 75 additional elective courses in other departments, colleges and schools. Total = 189 courses
Existing courses to be part of the new program	All 189 existing courses will be part of the new program.
Net New courses to be developed	Two new courses, GEOG 1140 and GEOG 1140L, Our Digital Earth, was developed in 2026 for this new degree. The faculty also will develop a new GEOG 3991, Internship in Geospatial Data Science.

b. Comment on the costs and workload related to the new course development.

(Consider professional development, course development time buy out, overload pay, and re-training.)

Costs and the workload related to the development of a new Internship course is expected to be minimal because it will be a geospatial version of our existing Geography/Atmospheric Sciences internship course. The new introductory geospatial course, GEOG 1140, Our Digital Earth, was developed in 2026. The faculty hope there will be a steady increase in enrollment in this course that may require a classroom with the capacity for a super section.

c. Explanation of the costs and workload associated to new sections of existing courses needed as a result of this program's enrollment.

(Consider whether current section offerings have capacity for new students, or if additional sections will be needed to cover student demand.)

All of the courses listed as required and electives in the proposed Geospatial Data Science major are already being taught by Geography faculty or faculty in other departments, colleges and schools. Given the number of course options both inside and outside of Geography, the faculty predict current course sections being able to accommodate additional students as enrollment in the Geospatial Data Science program increases over the next four years.

45. Faculty.

In the budget spreadsheet, you will be required to specify new faculty as well as the redirection of existing faculty to this new program. In this section, please provide narratives to support those projections.

a. Explain how the effort of existing faculty being reassigned to this new program will be replaced in other programs over the first four years.

(e.g., the previous department/program will increase overload pay, hire part-time faculty or a new faculty line in order to cover teaching or other workload).

The Geography Department currently has 30 faculty with nine teaching geospatial courses. The faculty do not anticipate faculty being reassigned to this new program. All of the courses listed as required and electives are already being taught, and given the breadth of course options both inside and outside of Geography, the faculty predict current course sections being able to accommodate additional students as enrollment in the Geospatial Data Science program increases over the next four years. One existing Geography faculty member will be assigned as the Programs Director for the three Geography degrees: Geography (A.B), Geography (B.S.) and Geospatial Data Science (B.S.). They will review the effectiveness of the program, collect data on student enrollment and success, and write annual reports. The Director will be responsible for marketing the program and coordinating with Geography administrators, faculty, and staff, as well as those in other departments, colleges and schools. They will update the list of required and elective courses being offered each semester within and outside of the department to assist the Geography Undergraduate Coordinator and Undergraduate Advisor. They will also work closely with the Internship Coordinator and the new Undergraduate Programs and Industry Engagement Coordinator to support the Atmospheric, Geography, and Geospatial Data Science undergraduate program operations and connect students with industry partners.

b. Explain your plan and rationale for new faculty for the program over the first four years.

The faculty do not anticipate the need for new faculty over the first four years of the new Geospatial Data Science major. There may be a need to fund additional Graduate Teaching Assistants once the program attracts new majors taking existing foundational geospatial courses needing additional lab sections. The faculty do not anticipate this happening in the first four years of the program.

46. Staff.

In the budget spreadsheet, you will be required to specify new staff as well as the redirection of existing staff to this new program. In this section, please provide narratives to support those projections.

a. Explain how current staff will contribute to the program during the first four years.

The faculty anticipate two current staff members will contribute to the program. The department's Office Manager and Assistant to the Department Head helps in many ways from assisting faculty and students who come to the Geography Main Office, to planning and implementing receptions for Geography social events. The Geography Communications Coordinator/Undergraduate Program Administrator will assist with marketing the new major and distributing social media content.

b. Explain your plan and rationale for new staff for this program over the first four years?

(Consider staff needs and support services, such as advisement, faculty support, etc.)

A new fulltime Undergraduate Programs and Industry Engagement Coordinator will be required to provide integrated support for our three-degree programs: Geography, Atmospheric Sciences and Geospatial Data

Science. This position would build stronger connections among students, faculty, alumni, employers, and industry partners. They will coordinate undergraduate program operations, support student progression and retention, facilitate experiential learning, and provide a consistent point of contact for external organizations interested in engaging with our students and programs. An important responsibility would be developing a more systematic industry engagement program. Additional duties will include assisting with the Geography Undergraduate Student Organization (GUSTO) and Student Chapters of the American Meteorology Society (AMS) and American Society for Photogrammetry and Remote Sensing (ASPRS), and managing the spaces for students to study and informally gather. Further details on the rationale for this new staff position are provided in F.43.

F3. Facilities

47. Can the program be accommodated using existing space based on the enrollment projections provided above?

☒ Yes, with no renovation
☐ Yes, with minor renovation
☐ Yes, with major renovation
☐ No, new space is required

48. Complete the table below. Provide the semester and year in which the space will be needed.

Space	Use Existing Space (as is)	Use Existing Space (Renovated)	New Space
Example Row	*4 offices total:* *2 faculty offices by fall 2024* *2 faculty offices by fall 2025*	*50-seat classroom by fall 2025*	
Classrooms	6 (20-30 seat) classrooms 3 (87 seat) auditorium-style classrooms We also have access to larger 300-seat classrooms on campus		
Wet Labs	NA		
Dry Labs	NA		
Other Specialized Instructional Spaces	4 (total 66-seats) computer labs by fall 2027		
Offices	12 faculty offices by fall 2027 1 Undergraduate Programs and Industry Engagement Coordinator office by fall 2027		

Office Service and Support Spaces (incl. conf rooms, copy rooms, breakrooms, storage)	1 conference room by fall 2027 4 rooms for drone equipment, meetings and research by fall 2027		
Student Study Space	A former classroom with space for approximately 20 students to use for a study space by fall 2027		
Other (Specify) Center for Geospatial Research	1 conference room, 8 offices, 10 computers by fall 2027		

49. What building(s) will be used to accommodate these programs?

a. Please indicate specific building areas or room numbers where possible.

Geography courses for the proposed B.S. in Geospatial Data Science will be held in the Geography-Geology Building of the main UGA campus (classrooms 147, 150, 154, 155, 200B, 200C, 200D, 216, 300A; computer labs 153, 321, 311, 313 and B27). Because the major requires six credit hours to be taken in colleges, schools and departments outside of Geography, elective courses will also be held in other buildings on the UGA main campus.

b. If new construction, leasing, or land acquisition is required, please describe those plans.

N/A

c. If the anticipated program includes labs or "other" specialized spaces, please describe specific requirements for these rooms, including equipment.

Computer labs located in the UGA Geography-Geology Building are equipped with double monitors and desktop computers with access to geospatial software such as Esri ArcGIS Pro and Q-GIS.

d. Are proposed existing spaces currently occupied? Describe what changes need to occur to make this space available for program use.

The proposed spaces are currently used for Geography courses that are already taught as part of the Geography and Atmospheric Science majors. The faculty anticipate that it will be necessary to schedule additional sections of these courses, and make use of larger auditorium classrooms.

50. What is the anticipated cost of facilities investments necessary during the first 4 years of the program? What is the planned funding source for initial facilities needs?

N/A

F4. Technology

51. Identify any major equipment or technology integral to program start-up and operations. List any equipment or assets over $5,000 (cumulative per asset) needed to start-up and run the program.

No major equipment or technology is needed to start this program. The UGA Geography Department is equipped with computers, the Center for Geospatial Research can provide access to their drones and geospatial, GeoAI; and programming software is provided by UGA.

(insert rows as needed)

	Technology and Equipment	Start-up Costs	On-going Costs	Est. Start Date of Operations/Use
1	None needed			
2				
3				
4				
5				
6				
Total Technology Costs		**0**	**0**	

RISKS AND ASSUMPTIONS

52. In the table below, list any risks to the program's implementation over the next four years (e.g., accreditation approval not received). For each risk, identify the severity (low, medium, high), probability of occurrence (low, medium, high), and the institution's mitigation strategy for each risk.

Insert additional rows as needed. (e.g. Are faculty available for the cost and time frame).

Risk	Severity	Probability	Risk Mitigation Strategy
Low enrolment of new majors	Medium	Low	If numbers are lower than anticipated, the faculty will increase efforts to advertise this major, especially to high schools in the Atlanta area, at professional society conferences, on social media and to industry partners. The faculty plan to solicit testimonials from our Geography graduates who are working in geospatial careers and highlight their stories on the department website. The faculty also will highlight potential internships and career opportunities with industry partners.

ADDITIONAL REQUIRED DOCUMENTS

☐ Signature page

☐ Budget Spreadsheet

☐ Attach your SACSCOC roster for the proposed program. Include in parentheses the individual with administrative responsibility for the program and whether listed positions are projected new hires and/or currently vacant.

☐ Letters of support, where relevant.

- From USG Collaboratives the institution will participate in as part of this program if the institution has not previously been part of the MOU.
- For doctorate programs, at least three external and one USG reviewer of aspirational or comparative peer programs. Provide information below.

  Note: External reviewers must hold the rank of associate professor or higher in addition to other administrative titles. It is the responsibility of the institution proposing the doctoral degree program to attain external reviews and submit those reviews to their proposal.

  External Reviewers (include name, title, institution, email, and phone number):
  1.
  2.
  3.

  USG Reviewer (include name, title, institution, email, and phone number):
  1.

☐ If applicable, MOUs, which explain the collaboration and how partners will share or contribute resources, from other institutions for which this program will be part of a pathway (see #19b and 37)

☐ If referenced in the proposal, any additional letters of support such as industry professionals documenting workforce need

☐ If referenced in the proposal, any survey instruments with response rates

Appendix A

Elective Geography Courses not in Geospatial Anchor (3xxx level or above)

Physical and Environmental Geography and Atmospheric Sciences Courses

- ATSC(GEOG) 3110 Climatology
- ATSC(GEOG) 3120-3120L Weather Analysis and Forecasting
- ATSC(GEOG) 3130 Atmospheric Hazards
- ATSC 3135 Hidden Figures in the Atmospheric Sciences
- ATSC 4111 Atmospheric Thermodynamics
- ATSC(GEOG)(ENGR) 4112 Atmospheric Dynamics
- ATSC 4114 Atmospheric Dynamics II
- ATSC 4116-4116L Introduction to Data Assimilation
- ATSC(GEOG) 4120 Synoptic Meteorology and Climatology
- ATSC(GEOG) 4121 Weather Forecasting Seminar
- ATSC 4131 Introductory Atmospheric Physics
- ATSC(GEOG) 4150 Physical Climatology
- ATSC(GEOG) 4160 Applied Climatology in the Urban Environment
- ATSC(GEOG) 4170-4170L Mesoscale and Radar Meteorology/Climatology
- ENGR(ATSC)(GEOG) 4161-4161L Environmental Microclimatology

- ENGR(GEOG) 4180 Special Topics in Atmospheric Sciences
- GEOG(ATSC) 3180 Global Climate Change: Causes and Consequences
- GEOG 4911 Collaborative Research in Atmospheric Sciences
- CRSS(HORT)(ANTH)(ECOL)(GEOG) 4930 Agroecology of Tropical America
- CRSS(HORT)(ANTH)(ECOL)(GEOG) 4931 Agroecology of Tropical America Field Trip
- FANR(ANTH)(ECOL)(GEOG)(INTL) 427 People, Planet, and Profit
- FORS(ECOL)(GEOG) 4250 International Forest Management
- GEOG 3010 General Geomorphology
- GEOG 3210 Biogeography
- GEOG 3290 Mountain Geography
- GEOG(PBIO) 4220 Ecological Biogeography
- GEOG(PBIO) 4240 Plant Geography
- GEOG 4290 Geography and Ethnoecology of Neotropical Mountains
- GEOG 4810 Political Ecology and Environmental Governance
- GEOG 4020 Fluvial Geomorphology
- GEOG 4030 Human-Environment Dynamics in Arid Landscapes
- GEOG 4040 Global Environmental Change Past and Present
- GEOG 4060 Field Methods: Environmental Monitoring and Assessment
- WASR(CRSS)(ECOL)(ENGR)(GEOG)(GEOL) 4700L Hydrology, Geology, and Soils of Georgia
- AENG(ATSC) 4111 Atmospheric Thermodynamics

Geography and Society Courses

- GEOG 3180 Global Climate Change: Causes and Consequences
- GEOG 3185 Climate Change Solutions
- GEOG 3633 Cities and Nature
- GEOG 3620 Globalization and the Making of the Modern World
- GEOG 3630 Introduction to Urban Geography
- GEOG 3640 The Geography of Human Rights
- GEOG 3660 Geography of Food Commodities
- GEOG 3670 Geographies in Climate Justice
- GEOG 3690 Introduction to Political Geography
- GEOG 4040 Global Environmental Change Past and Present
- GEOG 4610 Location Analysis
- GEOG 4620 Advanced Economic Geography
- GEOG 4630 Advanced Urban Geography
- GEOG 4631 Race, Inequality, and the American City
- GEOG 4632 Urban Social Movements
- GEOG 4633 Urban Political Ecology
- GEOG(INTL)(HIST) 4634 Paris and Modernity
- GEOG 4635 The City and Film
- GEOG 4640 Population Geography
- GEOG 4650 Industrial Geography
- GEOG 4660 Urban and Regional Development
- GEOG 4670 Geography of Development

- GEOG 4680 Gender and Geography
- GEOG 4690 Power, Politics, and Place
- GEOG(INTL) 4694 Politics and the Modern European State
- GEOG 4810 Political Ecology and Environmental Governance
- GEOG 4860 The Industrial Agro-Food System and Its Alternatives

Elective Geospatial Courses Outside of Geography (3xxx level or above)

Courses in Geology:

- GEOL 3020/3020L Surficial and Near-Surficial Processes
- GEOL 4080 Geomicrobiology
- GEOL 4220 Hydrogeology
- GEOL 4530/4530L Principles and Environmental Applications of GIS
- GEOL 4620 Exploration Geophysics
- GEOL 4640 Geochemical and Geophysical Surveys
- GEOL 4660 Shallow Geophysics
- WASR(CRSS)(ECOL)(ENGR)(GEOG)(GEOL) 4700L Hydrology, Geology, and Soils of Georgia

Courses in Warnell School of Forestry and Natural Resources

- FANR 3700 Natural Resources Data Processing
- FANR 3800/L Spatial Analysis of Natural Resources
- FANR 4201 Spatial Analysis for Integrative Natural Resource Problem Solving
- FANR 5620/L GIS Applications for Natural Resources and Ecology
- FANR 5640 Unmanned Aerial Systems in Natural Resources
- FORS 5650 Aerial Photogrammetry in Forestry

Courses in the Odum School of Ecology

- ECOL 3960 Applied Ecological Data Science
- ECOL 4450 Spatial Ecology

Courses in Crop & Soil Sciences:

- CRSS 4280 Programing Precision Agriculture
- CRSS 4050 Improving Nutrient and Energy Efficiency with Geographic Information Systems

Courses in Statistics:

[* = BS in Data Science Major Required Courses, ** = BS in Data Science Major Elective Courses]
[Note, several STAT classes have MATH and STAT prerequisites]

- STAT 3120 (3 hours) Introduction to Probability for Life Sciences
- STAT 4220* (3 hours) Applied Experimental Designs
- STAT 4230* (3 hours) Applied Regression Analysis (in R)
- STAT 4240** (3 hours) Sampling and Survey Methods (qualitative data analysis)
- STAT 4250* (3 hours) Applied Multivariate Analysis and Statistical Learning (Machine Learning)
- STAT 4270 (3 hours) Network Data Analysis and Graphical Models
- STAT 4280** (3 hours) Applied Time Series Analysis
- STAT 4290** (3 hours) Nonparametric Methods
- STAT 4350 (3 hours) Applied Bayesian Statistics

- STAT 4365/4365E (3 hours) Modern Statistical Programming (uses R and Python)
- STAT 4530* (3 hours) Statistical Inference for Data Scientists
- STAT 4620** (3 hours) Applied Categorical Data Analysis
- STAT 4660 (3 hours) Introduction to Quantitative Biology

Courses in Data Science:

[* = BS in Data Science Major Required Courses, ** = BS in Data Science Major Elective Courses]

- CSCI 3360* (4 hours) Data Science I
- CSCI 4360* (4 hours) Data Science II
- CSCI 4380* (4 hours) Data Mining or STAT 4250 (3 hours) Applied Multivariate Analysis and Statistics Learning
- CSCI 4370* (4 hours) Data Base Management
- STAT 4220* Applied Experimental Designs
- STAT 4230* Applied Regression Analysis (in R)
- CSCI 3030** (3 hours) Computing, Ethics, and Society
- STAT 4240** Sampling and Survey Methods (qualitative data analysis)
- STAT 4280** Applied Time Series Analysis
- STAT 4290** Nonparametric Methods
- STAT 4365** Modern Statistical Programming (uses R and Python)
- STAT 4620** Applied Categorical Data Analysis

Courses in Marine Science:

- MARS 4500 Field Study in Oceanography and Marine Methods
- MARS 4520 Quantitative Analysis of Ocean Data
- MARS 4800 Regional Oceanography of the South Atlantic Bight
- MARS 4600 Field Experiences in Coastal Georgia

Courses in Landscape Architecture, College of Environment + Design:

- EDES 4270 Environmental Design Uses of Geographic Information Systems
- EDES 4280E Environmental Design Uses of Geographic Information Systems
- Signature Studio for required courses that use geospatial techniques such as LAND 4070, LAND 4080, and LAND 4085.

Other Geospatial Courses:

- ANTH 4420L Anthropology of Landscape
- DMNA 7450 GIS and Disasters (with permission)
- ECOL 3520 Applied Field Ecology: A Coastal Experience
- ECOL 4450 Spatial Ecology
- ENGR 3120 Spatial Data Analysis
- ENGR 5930 GPS with Engineering and GIS Applications
- ENVE 4710 GIS for Urban Engineering, Planning, and Development
- CVLE 4775 Advanced Survey Methods using Drones (Study Abroad at Oxford)

Appendix B
Letters of Support from other UGA Departments, Colleges and Schools

B1. Franklin College of Arts and Sciences, Department of Statistics
B2. Franklin College of Arts and Sciences, Department of Geology
B3. Warnell School of Forestry and Natural Resources
B4. Odum School of Ecology
B5. School of Computing
B6. College of Environment and Design
B7. College of Agricultural and Environmental Sciences, Crop and Soil Sciences

UNIVERSITY OF GEORGIA

Franklin College of Arts and Sciences
Department of Statistics

November 10, 2025

Dr. Ben Ayers, Senior Vice President for Academic Affairs and Provost
University of Georgia
203 Administration Building
Athens, Ga. 30602-1651
provost@uga.edu

Re: Letter of support for the Department of Geography's proposed BS in Geospatial Data Science

Dear Provost Ayers,

I am pleased to provide this letter of support for the bachelor of science degree program in geospatial data science proposed by the UGA Department of Geography. This program will tap into substantial interest among students across campus and will produce graduates with crucial skills in geospatial geography, statistics and data science, and related disciplines. The program is well-crafted, with a broad selection of elective courses in important disciplines outside of geography, including an appropriate selection of classes offered by the Department of Statistics that are part of our undergraduate degrees in statistics and data science. Rather than competing with these programs, the proposed degree will nicely complement our undergraduate majors and will provide opportunities for collaboration and engagement across the two units.

I applaud the Department of Geography for putting together a strong proposal for a program that fill a need for well-trained individuals at the interface of data science and geography. On behalf of my department, I offer my full support to the proposal.

Sincerely,

David B Hall

Brooks Hall | 310 Herty Drive | Athens, GA 30602
Telephone 706-542-5680 | Fax 706-542-3391
An Equal Opportunity, Affirmative Action, Veteran, Disability Institution

Daniel B. Hall
Interim Department Head, Department of Statistics
University of Georgia
Athens, GA 30602

UNIVERSITY OF GEORGIA

Franklin College of Arts and Sciences
Department of Geology

210 Field Street
Athens, Georgia 30602-2501
TEL 706-542-2652 | FAX 706-583-2425
geohead@uga.edu
geology.uga.edu

August 19th, 2026

LOS: New Degree in Geospatial Data Science (Geography)

Deepak R. Mishra
Merle C. Prunty, Jr. Professor & Head
Department of Geography
University of Georgia
Athens, GA 3060

Dear Drs. Mishra and Madden:

The Department of Geology is pleased to support the proposed B.S. degree in Geospatial Data Science. The interdisciplinary focus of this program is well aligned with several areas of teaching and research in Geology, where spatial data collection, analysis, visualization, and interpretation are increasingly important.

Our department offers a number of courses that can serve as geospatial electives within the degree, including courses in GIS, geostatistics, hydrogeology, surface processes, geophysics, and field-based data collection. These courses will provide students opportunities to apply geospatial methods to Earth and environmental systems while broadening the range of disciplinary applications available within the program.

We appreciate the opportunity to contribute to this new degree and strongly support its development. We look forward to continued collaboration with the Department of Geography in preparing students for careers that increasingly require integrated geospatial and data-science skills.

Please feel free to contact me if you require any additional information.

Sincerely,

Adam Milewski
John & Barbara Dowd Professor of Hydrogeology
Department Head
UGA Faculty Innovation Fellow
Department of Geology
University of Georgia
Athens, GA USA

Commit to Georgia | give.uga.edu
An Equal Opportunity, Veteran, Disability Institution

Emails 20 August 2026

From: Jeffrey Todd Petty
To: C RHETT Jackson;Marguerite Madden
Cc: Deepak Mishra

Yes - happy to support.
And a reminder that the minor in geospatial analysis in natural resources is now available: https://bulletin.uga.edu/Program/Details/35035?IDc=FRS

Please share!
Todd

J. Todd Petty, PhD | *Dean*
Warnell School of Forestry and Natural Resources
180 E Green Street | Athens, GA 30602
706-542-2686 | todd.petty@uga.edu | https://warnell.uga.edu/

From: C RHETT Jackson
To: Marguerite Madden;Jeffrey Todd Petty
CC: Deepak Mishra

Hello Marguerite and Deepak: the Warnell School supports the creation of the Geospatial Data Science B.S. Degree in Geography, and we look forward to cooperating with Geography on educating students in spatial analysis. We welcome the students in our spatial analysis classes. Thank you, Rhett Jackson

C. Rhett Jackson
Associate Dean for Academic Affairs
John Porter Stevens Distinguished Professor of Water Resources
Warnell School of Forestry and Natural Resources, Building 1, Room 203
University of Georgia
Athens, GA 30602-2152
706-255-5067 Cell
762-499-4266 office
rjackson@warnell.uga.edu, rjacks@uga.edu (both emails route to the same place)

UNIVERSITY OF
GEORGIA
Odum School of Ecology

October 17, 2025

Deepak R. Mishra
Merle C. Prunty, Jr. Professor & Head
Department of Geography
University of Georgia
Athens, GA 30602

Dear Dr. Mishra:

The Odum School of Ecology is delighted to support the proposed B.S. degree in Geospatial Data Science. We offer the following courses that can count towards the degree:

— ECOL3960 Applied Ecological Data Science
— ECOL4450 Spatial Ecology

Additionally, we have a new GIS-based service-learning course (pending CAPA approval), which may also be of interest to students in your proposed BS degree program.

We at the Odum School appreciate the opportunity to contribute to interdisciplinary education and workforce development to meet important societal challenges. We fully support using our courses as part of your proposed degree and look forward to future collaborations.

Sincerely,

Pejman Rohani
Associate Dean for Academic Affairs, Odum School of Ecology
Regents' Professor
UGA Athletics Association Professor
Deputy Director, Center for Influenza Disease & Emergence Research

Email 14 August 2026

From: Gagan Agrawal
To: Marguerite Madden; Lakshmish MACHEERI Ramaswamy
CC: Deepak Mishra

The school of computing supports the proposal fully, including inclusions of the CSCI classes it is listing.

Gagan Agrawal, School Director & UGA Foundation Professor
School of Computing
415 Boyd Research and Education Center | Athens, GA 30602-7404
706-542-2911 | gagrawal@uga.edu

UNIVERSITY OF GEORGIA

Jackson Street Building
285 S. Jackson St
Athens, Georgia 30602
TEL 706-247-4332
Steffens@uga.edu
www.ced.uga.edu

College of Environment + Design

October 21, 2025

Letter of Support for the B.S. in Geospatial Data Science

Dr. Benjamin C. Ayers
Senior Vice President for Academic Affairs and Provost
Administration Building 203
UGA Campus

Dear Provost Ayers,

On behalf of the College of Environment and Design, I am sharing my strong endorsement for the proposal from the Department of Geography for a B.S. Degree in Geospatial Data Science. The degree program includes several courses from our bachelor of landscape architecture and urban planning and design programs.
We are happy to collaborate with the Department of Geography and other Colleges across campus on this new program.

I hope this certificate program is approved by the University and am looking forward to its start on campus.

Sincerely,

A. Steffens

Ashley Steffens, FCELA
Associate Dean of Academic Programs and Student Affairs
Crowley Professor of Urban Planning and Design
American Society of Landscape Architects, VP for Education

Cc: Ms. Fiona Liken
Associate Vice President for Instruction and Registrar
Office of Curriculum Systems
UGA CAMPUS

Email 2 December 2025

From: Leonardo M. Bastos
To: Marguerite Madden
CC: Jodi Lynn Johnson Maynard;Timothy Grey;Jessica G Barb;Leonardo M. Bastos;Deepak Mishra;Lorena Nunes Lacerda

Dear Dr. Marguerite Madden,

Thank you for reaching out about the Geospatial Data Science degree.

I teach two courses, one of which is focused on precision agriculture and geospatial data manipulation and analysis, with a focus on developing workflows using the R programming language.

The course code and name is CRSS 4280/6280 - Programing Precision Agriculture.

It would be fantastic to have it listed as an option for the degree.

Please let me know if you would like to discuss further or have any questions.

I am ccing here our colleague Dr. Lorena Lacerda from Crop and Soils, who also teaches two courses that could be great additions to the degree list.

Cheers,

Leo.

Leonardo M. Bastos
Department of Crop and Soil Sciences
Assistant Professor, Integrative Precision Ag
4101 Miller Plant Sciences Hall
Athens, GA 30602
e: lmbastos@uga.edu
w: leombastos.github.io/bastoslab

Faculty Roster Form
Qualifications of Full-Time and Part-Time Faculty

Name of Institution: The University of Georgia

Name of Primary Department, Academic Program, or Discipline: Department of Geography

Academic Term(s) Included: Fall, Spring and Summer **Date Form Completed:** 08/20/2026

1 **NAME (F, P)** ***All are existing faculty**	2 **COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]**	3 **ACADEMIC DEGREES & COURSEWORK** **Relevant to Courses Taught, Including Institution & Major**	4 **OTHER QUALIFICATIONS & COMMENTS** **Related to Courses Taught**
Marguerite Madden (F) (Administrative Responsibility)	Fall, GEOG 4330/6330 and lab Aerial Photographs and Image Interpretation, 3, (UN, G) Fall, GEOG 4460/6460 Field Methods and Remote Sensing, 3, (UN, G) Spring, GEOG 8450 Geographic Techniques in Landscape Analysis, 3, (G) Spring, GEOG 8550 Advanced Remote Sensing of Environment, 3, (G) Past, GEOG 4350/6350 and lab Remote Sensing of Environment, 3, (UN, G) Past, Fall, GEOG 4370/6370 and lab Geographic Information Science, 3, (UN, G)	The University of Georgia, Ph.D., Ecology, 1990 State University of New York at Plattsburgh, M.A. Biology, 1984 State University of New York at Plattsburgh, B.A., Biology, 1979	Director, Center for Geospatial Research, Department of Geography, 2004-2024 Associate Director, Center for Geospatial Research, Department of Geography, 2024-present Lead Science Advisor, NASA DEVELOP Georgia Node, 2013-2025 President, American Society for Photogrammetry and Remote Sensing (2007) Technical Commission IV President, International Society for Photogrammetry and Remote Sensing (2008-2012) Second Vice President, International Society for Photogrammetry and Remote Sensing (2012-2016)

Abbreviations: F, P: Full-time or Part-time; D, UN, UT, G: Developmental, Undergraduate Nontransferable, Undergraduate Transferable, Graduate; Dual: High School Dual Enrollment Course

1	2	3	4
NAME (F, P) ***All are existing faculty**	**COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]**	**ACADEMIC DEGREES & COURSEWORK** **Relevant to Courses Taught, Including Institution & Major**	**OTHER QUALIFICATIONS & COMMENTS** **Related to Courses Taught**
Deepak Mishra (F) (Administrative Responsibility)	Fall, GEOG 4350/6350 and lab Remote Sensing of Environment, 3, (UN, G) Spring, GEOG 8450 Geographic Techniques in Landscape Analysis, 3, (G) Spring, GEOG 8550 Advanced Remote Sensing of Environment, 3, (G)	University of Nebraska-Lincoln: Lincoln, NE., Ph.D. Natural Resources, 2006 Indian Institute of Technology: Kanpur, India, M.S. Civil Engineering. 2002 Pondicherry University: Pondicherry, India, M.S. Earth Sciences. 2000 Berhampur University: Berhampur, India, B.S. Geology, 1998	Director, Center for Geospatial Research, Department of Geography, 2024-present Director, UGA's Small Satellite Research Lab, 2016-present
Jerry Shannon (Administrative Responsibility)	Fall, GEOG 4385/6385 and lab Community GIS, 3, (UN, G) Fall, GEOG 4300/6300 Data Science in Geography, 3, (UN, G) Flex, GEOG 2011 and lab Maps, Data, and Society 3, (UN) Spring, GEOG 4636/6636 Maps and the City 3, (UN, G)	2013, Ph.D. in Geography, graduate minor in GIS, University of Minnesota, Minneapolis, MN, Advisors: Helga Leitner and Steven Manson, Dissertation: *Rethinking Food Deserts: the practice and politics of food access* 1999, M.A.T. in English Education, 1999, University of Iowa, Iowa City, IA 1997, B.A. in English with honors and highest distinction, 1997, University of Iowa, Iowa City, IA	Director, Community Mapping Lab, 2015-present
Kayla Anderson (F) (Administrative Responsibility)	Fall/Spring GEOG 2011 and lab Maps, Data, & Society, 3 (UN) Summer, GEOG 2011E and lab Maps, Data, & Society, 3 (UN)	Vanderbilt University: Nashville, TN, Ph.D. Community Research & Action, 2025 Vanderbilt University: Nashville, TN, M.Ed. Community Development & Action, 2020 Whitworth University: Spokane, WA, B.A. Sociology, 2013	Assistant Clinical Professor in Community Geography and Undergraduate Internship Coordinator

Abbreviations: F, P: Full-time or Part-time; D, UN, UT, G: Developmental, Undergraduate Nontransferable, Undergraduate Transferable, Graduate; Dual: High School Dual Enrollment Course

1	2	3	4
NAME (F, P) ***All are existing faculty**	**COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]**	**ACADEMIC DEGREES & COURSEWORK** **Relevant to Courses Taught, Including Institution & Major**	**OTHER QUALIFICATIONS & COMMENTS** **Related to Courses Taught**
Steven Holloway (F)	Fall, GEOG 3633 Cities and Nature, 3, (UN) Fall, GEOG 4631/6631 Race, Inequality and the American City, 3, (UN, G) Spring, GEOG 3630 Introduction to Urban Geography, 3, (UN) Spring, GEOG 4630/6630 Advanced Urban Geography, 3, (UN, G) Spring, GEOG 8630 Seminar in Urban Geography, 3, (G) Past, GEOG 4300/6300 Data Science in Geography, 3, (UN, G) Past, GEOG 8300 Multivariate Techniques in Geography, 3, (G)	Ph.D. Geography, University of Wisconsin-Madison (Ph.D. minor in quantitative Sociology) M.A. Geography, University of Georgia B.A. Geography, California State University, Chico	Held Special Sworn Status for Restricted Access to Individual-Level Census Data, U.S. Census Research Data Center (RDC) Director, Urban & Metropolitan Studies, University of Georgia

Abbreviations: F, P: Full-time or Part-time; D, UN, UT, G: Developmental, Undergraduate Nontransferable, Undergraduate Transferable, Graduate; Dual: High School Dual Enrollment Course

1	2	3	4
NAME (F, P) ***All are existing faculty**	**COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]**	**ACADEMIC DEGREES & COURSEWORK** **Relevant to Courses Taught, Including Institution & Major**	**OTHER QUALIFICATIONS & COMMENTS** **Related to Courses Taught**
Angela Yao (F)	Fall, GEOG 4370/6370 and lab Geographic Information Science, 3, (UN, G) Fall, GEOG 8571Geoanalytics for Health Data and Research 3, (G) Spring, GEOG 4470/6470 and lab Advanced Geospatial Analysis and Spatial Statistics, 3, (UN, G) Spring, GEOG 4380/6380 and lab Transportation Modeling and GIS, 3, (UN, G) Spring, GEOG 8350 Seminar in GeoAI, 3, (G)	PhD, Geography, University at Buffalo, the State University of New York, USA M.S, GIS for Urban and Regional Analysis, ITC (now Twente University), the Netherlands B.S., GIS and Urban Planning, WTUSM (now Wuhan University), China	President, University Consortium of Geographic Information Science (2026-2027) Editor in Chief, Cartography and Geographic Information Science (2025- present) Director, Urban GeoAnalytics (UrGA) Research Lab

Abbreviations: F, P: Full-time or Part-time; D, UN, UT, G: Developmental, Undergraduate Nontransferable, Undergraduate Transferable, Graduate; Dual: High School Dual Enrollment Course

1	2	3	4
NAME (F, P) ***All are existing faculty**	**COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]**	**ACADEMIC DEGREES & COURSEWORK** **Relevant to Courses Taught, Including Institution & Major**	**OTHER QUALIFICATIONS & COMMENTS** **Related to Courses Taught**
Lan Mu (F)	Fall, GEOG 4590/6590 and lab Programming for GIS, ,3, (UN, G) Fall, GEOG 8571Geoanalytics for Health Data and Research 3, (UN, G) Fall, GEOG 8572 Seminar in Urban Data Science, 3, (UN, G) Spring, GEOG 4370/6370 and lab Geographic Information Science, 3, (UN, G) Spring, GEOG 4410/6410 and lab Geovisualization and Data Visualization, 3, (UN, G) Spring, GEOG 4571/6571 and lab GIScience for Health and Environment 3, (UN, G)	Ph.D. in Environmental Planning University of California, Berkeley, Berkeley, CA. M.A. in Geography and Planning University of Toledo, Toledo, OH B.S. in Environmental Science Peking University, Beijing, China	Director, UGA GIScience Certificate Program 2015-Present Courtesy Faculty, College of Public Health, UGA Research Group Director, GIS.HEAL (GIScience for Health and Environment Analytics Lab)
Weiming Hu (F)	Fall, GEOG 4591/6591 Intro to Geospatial AI Spring, GEOG 4592/6592 Advanced Geospatial AI Spring, GEOG 8120 Climate Seminar	PhD Geography and Computer Science (Minor), Penn State M.S. Geography, Penn State B.E. Wuhan University, China	Committee, AGU Informatics Program Committee, NCAR/UCAR Improving Scientific Software Assembly Core Faculty, Center for Geospatial Research Affiliated Faculty, Institute for AI

Abbreviations: F, P: Full-time or Part-time; D, UN, UT, G: Developmental, Undergraduate Nontransferable, Undergraduate Transferable, Graduate; Dual: High School Dual Enrollment Course

1	2	3	4
NAME (F, P) ***All are existing faculty**	**COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]**	**ACADEMIC DEGREES & COURSEWORK** **Relevant to Courses Taught, Including Institution & Major**	**OTHER QUALIFICATIONS & COMMENTS** **Related to Courses Taught**
Yaping Xu (F)	Fall, GEOG 4591/6591 Intro to GeoAI, 3, (UN, G) Spring, GEOG 4450/6450 Digital Image Analysis, 3, (UN, G)	Louisiana State University: Ph.D. in Geography, 2019 University of Chinese Academy of Sciences: M.S. in Cartography and GIS, 2013 Guizhou University, China: B.E. in Geographic Information System, 2009	Teaching Assistant & Instructor, Department of Geography and Anthropology, Louisiana State University, 2014-2018 Assistant Professor of GIScience, Department of Environment and Geosciences, Sam Houston State University, 2023–2026 Assistant Professor, Department of Geography and Institute of Artificial Intelligence, University of Georgia, 2026–present
Sergio Bernardes (F)	Fall, GEOG 4330/6330 Aerial Photographs and Image Interpretation, 3, (UN, G) Summer, Fall CSCI 4950 Faculty-Mentored Undergraduate Research (UN) Spring, Fall, GEOG 8590 Directed Problems in Geographic Techniques, 3, (G) Spring, HIST 7500 History and GIS, 3, (G)	The University of Georgia, Ph.D., Geography, 2013 The University of Georgia, Certification in Geographic Information Science, 2013 Brazilian National Institute for Space Research, M.S. Remote Sensing, 1996 Viçosa Federal University, B.S., Agricultural Engineering, 1991	Associate Director, Center for Geospatial Research, Department of Geography, 2016-present Federal Aviation Administration Remote Pilot Certification, 2017-present NASA Postdoctoral Program Fellow, NASA Goddard Space Flight Center, 2014-2016

1	2	3	4
NAME (F, P) ***All are existing faculty**	**COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]**	**ACADEMIC DEGREES & COURSEWORK** **Relevant to Courses Taught, Including Institution & Major**	**OTHER QUALIFICATIONS & COMMENTS** **Related to Courses Taught**
Abhishek Kumar (P)	Fall, GEOG 4330/6330 and lab Aerial Photographs and Image Interpretation, 3, (UN, G) Fall, GEOG 4460/6460 and lab Field Methods and Remote Sensing, 3, (UN, G)	The University of Georgia, Ph.D., Geography, 2021 National Institute of Technology, Rourkela, India, M.Tech., Mining Engineering, 2014 Biju Patnaik University of Technology, Odisha, India, B.Tech., Electronics & Communication Engineering, 2012	Assistant Research Scientist, Department of Geography, 2025-present

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