




Geographic Information Science (GIS) Minor

2021-2022 Program Form: Undergraduate New

General Catalog Information

** Read before you begin **

1. **TURN ON** help text before starting this proposal by clicking  in the top right corner of the heading.
2. **DO NOT** type any changes before launching the proposal. Required fields are marked with an *. The form cannot be launched without filling those in.
3. If changes will occur in a required field, launch the proposal with existing attributes -- in other words, proposed changes should not be made prior to launching the proposal. If the required field will be empty, type a period in the field prior to launch.
4. **LAUNCH** proposal by clicking  in the top left corner. **DO NOT** make proposed changes before launching proposal. Changes will only be tracked after proposal is launched.
5. **GO TO** discussion  in the right panel, and change "Show current" to "Show current with markup" to track changes.
6. **MAKE CHANGES** to the proposal so they can be tracked. Attach any needed documents and approve the proposal to go to the next step.

For a new degree program, in addition to EPC program and course forms you must complete all procedures and forms found in the "[SCHEV Proposal Guidelines](#)."

Catalog Year of Implementation *

2021-2022

2021-2022

Hierarchy Owner *

Department of Biological and Environmental Sciences

Department of Biological and Environmental Sciences

PROPOSED PROGRAM INFORMATION

Degree Type *

Minor

Minor

- Type of Program***
- Major .
- Minor
- Endorsement
- Certificate .
- Concentration.

Title* Geographic Information Science (GIS) Minor

Is this an Interdisciplinary program?* Yes No

List the Total Credits for the program. If this is a major, list Total Credits for the entire degree, not just the total for the major.

Total Credits* 19

PROPOSED CATALOG DESCRIPTION OF PROGRAM

Program Catalog Description*

The Geographic Information Science (GIS) minor provides foundational coursework and training in GIScience complementary to a variety of disciplines including, but not limited to environmental science, biology, archaeology, homeland security, criminal justice, sociology, public administration, history, business, and computer science. The GIS minor provides students an understanding of core geospatial concepts and techniques, in addition to application of these concepts and skills to real world problem solving. Required coursework emphasizes foundational principles of GIScience, including projections and coordinate systems, cartography and map design, geodatabase management, geoprocessing, and programming. Elective coursework provides opportunities for students to advance their GIScience knowledge and skills with coursework in geospatial modeling and analysis, remote sensing, global positioning systems, and critical and participatory GIS, among others.

GIS minors may count Core courses satisfying minor requirements as also satisfying their respective Core requirements, up to two Pillar courses and one Perspectives course. The following are the courses in this minor that may be used in this way:


- MATH 171: Statistical Decision Making/3 credits
- CMSC 140: Introduction to Programming/3 credits

Courses satisfying minor requirements that are designated as Civitae Core courses subsequent to the print deadline of this Catalog will be eligible to also satisfy Civitae Core requirements, subject to the above rules.



Students who are interested in pursuing the GIS minor should contact the chair of the Department of Biological and Environmental Sciences. Grades below C- will not apply toward the fulfillment of minor requirements.

Follow these steps to propose (changes to) the program curriculum:

Step 1 Add all courses to be used in program.

Start in  "View Curriculum Courses." There are two options to add courses for proposed changes: "Add Course" and "Import Course." For courses already in the catalog, click on "Import Course" and find the courses needed. For new classes going through a Curriculog Approval Process click on "Add Course"-- a box will open asking you for the Prefix, Course Number and Course Title.


Step 2 Set up program requirements.

Click on  "View Curriculum Schema." and select the core header of the program where you would like to add/remove courses to expand the section. Click on "Add Courses" to bring up the list of courses available from Step 1. Select the courses you wish to add. If you mistakenly added a course and need to remove it, click on the  and proceed.

Step 3 Review full program structure.

Click on  to view the full program.

Step 4 Track changes made

Go to discussion  in the right panel and select "Show current with markup". Click the core header of the program to expand the section and track changes.

Program Curriculum*

Course(s) to be added [including new courses]:*

CMSC - 140 - Introduction to Programming
 EASC - 383 - Introduction to Remote Sensing
 EASC - 430 - Geospatial Modeling and Analysis
 GEOG - 240 - GIS Programming with Python
 GEOG - 275 - Introduction to Geographic Information Systems
 GEOG - 358 - Map Design and Analysis
 GEOG - 383 - Introduction to Remote Sensing
 GEOG - 430 - Geospatial Modeling and Analysis
 GEOG - 465 - Advanced Topics in Geographic Information Sciences
 MATH - 171 - Statistical Decision Making

RATIONALE FOR PROGRAM

Enter the rationale for the program, including a statement about how the program aligns with Longwood's mission.*

Knowledge and experience in the field of Geographic Information Sciences (GIScience) is a characteristic that is highly sought after by employers in many disciplines, including environmental science, biology, homeland security, criminal justice, public administration, history, business, and computer science. The U.S. Department of Labor reported that the expected growth rate of geospatial technology careers is 15% for 2018-2028, exceeding the national average for other occupations (U.S.

Dept. of Labor 2019). Evidence of this is apparent as graduates of Longwood's Integrated Environmental Sciences program search for jobs after graduation, the majority of which list GIScience experience and skills as a required or preferred qualification. However, the supply of qualified individuals is not keeping up with the demand. A report produced by the National Geospatial Advisory Committee stated that: "A shortage of qualified and skilled workers exists to meet the demands of this fast growing industry. Efforts must be undertaken across all levels of government, private sector, academic community, and professional associations to prepare workers to take advantage of new geospatial job opportunities in high demand and economically vital sectors of the American economy" (NGAC 2012).

Thus, there is an opportunity for Longwood to offer a program that prepares students in all disciplines for career opportunities involving geospatial and GIScience skills, thus making them more competitive and marketable to employers. In this manner, our program works concomitantly with Longwood's Strategic Plan to transform lives and prepare students for future careers and/or graduate study. We are uniquely suited to fill this niche, as we already have access to ESRI's ArcMap software which is the primary program used in industry, academia, and research sectors for GIScience analyses. Additionally, new faculty hires across campus (including the IES, History, and Honors programs) provide the bandwidth for the program to support the offering of courses that would support a minor in GIScience.

GIScience is applied ubiquitously throughout today's society; "The federal government uses it to manage forests, develop defense strategies, establish tax valuations and employ census data to determine voting districts. Utility companies use it to automate transmission and distribution networks and to build and service pipelines and communication networks. Cities are using geospatial technologies for applications as diverse as routing sanitation and emergency vehicles, replacing water mains, and matching equipment to job requirements. Private companies use geospatial information to make more informed decisions in areas ranging from site selection, to marketing demographics, to analyzing competition" (U.S. Dept of Labor). In the field of environmental science, "GIS technology is playing an increasingly crucial role in the delivery of information to decision makers, environmental managers, and the public (Scally 2006). This minor will provide students with the knowledge and skills necessary to competently and confidently approach a myriad of real-world problems and contribute to the development of solutions, thus fully supporting and complimenting the mission of Longwood University – to develop citizen leaders who are prepared to make positive contributions to the common good of society.

National Geospatial Advisory Committee (NGAC). 2012. "Geospatial Workforce Development." < <https://www.fgdc.gov/ngac/ngac-geospatial-workforce-development-paper-final.pdf> > Accessed 18 October 2019.

Sally, Robert. 2006. GIS for Environmental Management. ESRI Press, California, U.S.


U.S. Department of Labor. 2019. "Occupational Outlook Handbook". Bureau of Labor and Statistics. < <https://www.bls.gov/ooh/>> Accessed 18 October 2019.

Enter the anticipated enrollment in the program after five years.*

Due to the interdisciplinary applicability of GIScience knowledge and skills, it is expected that the minor will be populated by students from a variety of majors; a total program enrollment of approximately 15 students is anticipated after 5 years.

AFFECTED DEPARTMENTS OR PROGRAMS

IF the proposal could have an impact on other departments or programs, the appropriate affected department chairs or program coordinators should be notified. Where teaching licensure may be affected, the proposal will go through the Professional Education Council.

To notify the appropriate department chairs or program coordinators, request a custom route. To do so: navigate to the Proposal Toolbox and select Custom Route under the Decisions icon (). Once you make your decision the system will allow you to set up the requested ad-hoc step. The name of the route should be: Chair/Coordinator Notification. The participants should be the relevant affected chairs or coordinators. You can also select rules, decisions, and deadlines/reminders.

A System Administrator will need to review and approve your request before it can proceed.

List other departments / programs that might be affected.*

Math and Computer Science

List individuals contacted and date of custom route submission.

Phillip Poplin Oct 23 2019

Does this program lead to teaching licensure, or will it affect an existing program's licensure?*

Yes No

RESOURCE ASSESSMENT

Describe anticipated changes in staffing for this program.*

Newly hired faculty member will be including at least two of the new courses in his teaching load (GEOG/EASC 383: Introduction to Remote Sensing; GEOG/EASC 465: Advanced Topics in GIS).

Two faculty members will be team teaching one new course (GEOG/EASC 430: Geospatial Modeling and Analysis), with each teaching for approximately 1/2 of the semester, and will thus count only 1/2 of the contact hours in their teaching loads during one semester every other year.

Another new course (GEOG/EASC 240: GIS Programming with Python) was already taught as a special topics course that fits into the faculty member's teaching load.

Since the number of additional students per semester is expected to be small, this can easily be accommodated into other existing courses that are already offered frequently enough to make the minor feasible.

Estimate and itemize the cost of new equipment, library resources, technology, and/or other resources required to carry out this program proposal.*

Longwood's current subscription to the site-wide license for ESRI's ArcMap software must be maintained.

No additional needs anticipated

ATTACHMENT LIST

Please attach any required files by navigating to the Proposal Toolbox and clicking  in the top

right corner.

Attach (for Majors, Certificates, Substantively Different Concentrations)	<input type="checkbox"/> Academic Initiative Planning Checklist
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Attach	<input type="checkbox"/> Fee Recommendation Worksheet
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All curriculum proposals/changes are processed in the date order received.

Course changes intended to go into effect for the following summer or fall must reach EPC by November 1. All other curriculum proposals to be implemented in the following summer or fall (including program changes and new courses) must reach EPC by December 15.

Curriculum proposals intended to go into effect the following intersession or spring, and proposals related to academic policy must reach EPC by March 1.

Submission within the deadlines does not guarantee processing in time for the next academic year's catalog.

For the Curriculum Development Handbook, see <http://blogs.longwood.edu/curriculum/>.

REGISTRAR ONLY

Program OID	
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Program Type	
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Degree Type	
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Status	<input checked="" type="radio"/> Active-Visible <input type="radio"/> Inactive-Hidden
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