The US Department of Labor has identified Geospatial Information Scientists and Technologists, Geographic Information Systems Technicians, and Cartographers and Photogrammetrists as **occupations** that are expected to **grow rapidly**, will have more than average **job openings**, or are **new and emerging careers**!

**GIScience credits can count toward a master’s degree in several departments such as Geography, Physical Science, Environmental Sciences, Technology Management, and Information Technology. Please see an advisor in the appropriate department.**

**GIScience electives:**
- BSC 510/PS 510 Remote Sensing/GIS Applications (4 credit hours)
- BSC 511/PS 511 Digital Image Processing/GIS Model (4 hrs.)
- GEO 529 Principles of GIS 2 – Vector Analysis (4 hrs.)
- GEO 530 GIS – Raster Analysis (4 hrs.)
- GEO 531 Principles of Remote Sensing and Photogrammetry (3 hrs.)
- GEO 532 Enterprise GIS (3 hrs.)
- GEO 533 GPS and Mobile Geospatial Technologies (3 hrs.)
- GEO 540 Spatial Statistics and GIS (4 hrs.)
- GEO 631 Applied GIS Projects (3 hrs.)
- GEO 690 Internship (1-6 hrs.; must be GIScience approved by the student’s advisor in advance)
- IS 645 Geographic Information Systems (3 hrs.)
- NRRM533 GIS and Remote Sensing in Natural Resource Management (3 hrs.)
- NRRM602 GIS/RS Research Method in NRRM (3 hrs.)
- PS 570 Practicum (4 hrs.; must be GIScience approved by the student’s advisor in advance)
- PS 670 Advanced Practicum (4 hrs.; must be GIScience approved by the student’s advisor in advance)
- Special Topics courses as approved by the GIScience Curriculum Committee
- Independent Studies courses as approved by the student’s advisor in advance

For more information, contact:
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Geospatial Information Science

**Graduate Certificates**

For more information, see [http://www.marshall.edu/giscience](http://www.marshall.edu/giscience)
Admission Requirements
Students may pursue the graduate certificate while enrolled in any master’s program OR as a certificate-only student. Students already enrolled in a master’s degree program should submit to the Graduate College a Secondary Program Request form available at www.marshall.edu/graduate/. Applicants interested in the certificate-only program should apply for admission to Marshall University as a Certificate/Professional Development student and select on the application form the Certificate in Geospatial Information Science - Basic.

Program
A graduate certificate in Geospatial Information Science - Basic consists of a minimum of 12 graduate credit hours in courses designated as GIScience Courses, including regularly offered courses as well as special topics courses. Students must have a B (3.0) average in their GIScience courses and no grade below a C (2.0) in their GIScience courses to earn the certificate. The program is designed to:

- offer GIS study in a variety of disciplines with a variety of applications;
- teach students GIS techniques;
- teach students to apply GIS to solve scientific research problems;
- encourage students to gain experience in the GIS field by means of internships;
- integrate GIS applications with computer science concepts;
- prepare students for GIS employment or additional work at the doctoral level.

GIScience required course:
GEO 526 Principles of GIS (4 hrs.) – requirement waived if GEO426 or its equivalent taken as an undergraduate.

Electives: Choose additional GIScience electives to reach 12 hours. For a complete list, see the list on the back of this brochure or http://www.marshall.edu/giscience.

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Admission Requirements
Applicants to the Graduate GIScience Certificate – Advanced program must have completed the Certificate in Geospatial Information Science – Basic or the equivalent of the Basic certificate before entry into the program.

Program
An Advanced graduate certificate in GIScience consists of a minimum of 12 graduate credit hours in courses designated as GIScience courses beyond the requirement for the GIScience Certificate - Basic. Students must have a B (3.0) average in all their GIScience courses and no grade below a C (2.0) in their GIScience courses to earn the certificate. Students who complete the requirements for the Advanced certificate should be able to:

- perform advanced GIScience techniques using vector, raster, and remote sensing data;
- apply GIScience to display, support, and analyze research questions in the social or natural sciences;
- collect and create GIScience data using various technologies and softwares;
- recognize and apply computer science concepts such as data collection, representation, queries, and storage; and
- enter GIScience employment or continue GIScience work at the doctoral level.

Required courses:
- At least one advanced analysis course: GEO 529 Principles of GIS 2 — Vector Analysis or GEO 530 GIS Raster Analysis. Requirement is waived if a student completed one of these courses as part of the Certificate in Geospatial Information Science – Basic, an undergraduate equivalent of one of these courses, or an equivalent advanced analysis course from another institution.
- At least one remote sensing course: GEO531 Principles of Remote Sensing and Photogrammetry (3 hours), BSC/PS510 Remote Sensing with GIS Applications (4 hours), BSC 511/PS 511 Digital Image Processing and GIS Modeling (4 hrs.), NRRM533 GIS and Remote Sensing for Natural Resource Management (3 hrs.), or a Special Topics remote sensing course. This requirement is waived if a student completed one of these courses as part of the Certificate in Geospatial Information Science – Basic, an undergraduate equivalent of one of these courses, or an equivalent Remote Sensing course from another institution.
- At least one research methods or internship course: GEO 690 Internship (must be GIScience approved by the student’s advisor in advance), or NRRM602 GIS/RIS Research Method in NRRM.

Electives: Choose additional GIScience courses to reach 12 hours. For a complete list, see the list on the back of this brochure or http://www.marshall.edu/giscience.