You Might Like This Program If...

- You are interested in the use of big data to analyze spatial, social, and natural phenomena about our world.
- You want to learn how spatial big data models aid in understanding logistics, finance, shipping, advertising, entertainment, and journalism.
- You are curious about how big data can deliver much-needed context to decision making in many areas.
- You want to know where and when people and things exist in the real world.

What is Geospatial Big Data Analytics?

No matter how sophisticated information technology gets, there is nothing that can replicate the combination of two unique pieces of data: time and place. Geospatial data come from a variety of sources, including sensors, GPS-enabled devices, volunteered geospatial data, and location-linked records and social media posts. Geographic information scientists and other geographers collect and use big data to analyze social and natural phenomena about our world. As geospatial data become more ubiquitous, big digital geospatial data has become an essential part of geographic analysis. Students enrolled in this certificate can learn how to collect, process, analyze, and communicate a wide range of geospatial data.

You Might Like This Program If...

Program Requirements

To earn an undergraduate certificate in Geospatial Big Data Analytics, a minimum of 12 credits is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG 365</td>
<td>Introduction to GIS Programming</td>
<td>3</td>
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<tr>
<td>GEOG 461W</td>
<td>Dynamic Cartographic Representation</td>
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<tr>
<td>GEOG 464</td>
<td>Advanced Spatial Analysis</td>
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<tr>
<td>GEOG 465</td>
<td>Advanced Geographic Information Systems Modeling</td>
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<tr>
<td>GEOG 485</td>
<td>GIS Programming and Software Development</td>
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<tr>
<td>GEOG 462</td>
<td>Advanced Observation of Earth and Its Environment</td>
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<tr>
<td>GEOG 463</td>
<td>Geospatial Information Management</td>
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<tr>
<td>GEOG 481</td>
<td>Topographic Mapping with Lidar</td>
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Non-Course Requirements

Per University policy, all credit courses for a certificate require a grade of 'C' or higher, and at least two-thirds (2/3) of the credits used to complete a certificate must be earned at Penn State. If student is completing multiple certificates in Geography, no more than one (1) course may double-count for each.

Prerequisites not included in Geospatial Big Data Certificate:


Academic Advising

The objectives of the university’s academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee’s unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (https://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/)

University Park

Jodi Vender
Undergraduate Advising Coordinator
305 Walker Building
University Park, PA 16802
814-863-5730
Career Paths
There are many potential careers for big data geospatial scientists. Students earning the Geospatial Big Data Analytics certificate learn a wide range of technological, research, and analytical skills that are highly valued by employers. Big data geography undergraduates find jobs in all levels of government, nonprofit organizations, and industry. This is one of several geography-related certificates that students can use to tailor their educational experience in preparation for the job market. The Department of Geography also offers certificates in Environment and Society Geography; Geographic Information Science; Human Geography; Justice, Ethics and Diversity in Space; Landscape Ecology and Physical Geography.

Careers
Students earning the certificate in Geospatial Big Data Analytics are well positioned to find employment with diverse organizations spanning business, government, and nonprofit sectors. Such organizations may include (but are not limited to): American Red Cross; Amnesty International; BAE Systems; Boeing; Esri; Federal Emergency Management Agency; NASA; National Geographic; National Park Service; United Nations; U.S. Army Corps of Engineers; U.S. Census Bureau; U.S. Environmental Protection Agency; local, regional, and state planning agencies; environmental and engineering consulting firms; State Department; and humanitarian organizations.

Opportunities for Graduate Studies
A certificate in Geospatial Big Data Analytics is useful for students who are interested in pursuing graduate degrees in the computational, environmental, and social sciences. Alumni enter graduate and professional studies in a variety of programs, including (but not limited to) geography, planning, international development, urban studies, sustainability, environmental sciences, ecology, geographic information sciences, information technology, environmental informatics, geodesign, business administration, supply chain management, emergency management, law, and education. They sometimes begin graduate or professional programs directly after finishing undergraduate studies, but often get several years’ work experience before returning to school, either full or part-time.

Professional Resources
- American Association of Geographers (AAG) (https://www.aag.org)
- North American Cartographic Information Society (NACIS) (https://nacis.org)
- ASPRS: The Imaging & Geospatial Information Society (https://www.asprs.org)
- Urban and Regional Information Systems Association (URISA) (https://www.urisa.org/)
- International Cartographic Association (ICA) (https://icaci.org/)