

## Geographic Information Systems and Computer Science, BS

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A Bachelor of Science degree in Geographic Information Systems + Computer Science (GIS+CS) enables understanding of geospatial processes as well as process-based/algorithmic approaches to problem solving. The changing nature of geospatial data (e.g. location-based data) and associated analytical methods (e.g. machine learning) requires professionals who can blend these two approaches – i.e. develop processes and algorithms while understanding the larger context within which they occur. The GIS+CS degree provides this blend but also offers two tracks – Computer Science (CS) or Information Technology (IT). The CS Track focuses on machine learning and artificial intelligence. The IT Track focuses on construction, maintenance, and management of computational infrastructure and IT project management.

### Hours required and general/college requirements

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A minimum of 120 semester hours, of which 42 must be advanced, and fulfillment of degree requirements for the Bachelor of Science degree as specified in the [University Core Curriculum](#) in the Academics section section of this catalog and the College of Liberal Arts and Social Sciences requirements.

### Major requirements, 46 hours

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#### Computer Science, 13 hours

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- [CSCE 1030 - Computer Science I](#)  
or
- [CSCE 1035 - Computer Programming I](#)
  
- [CSCE 1040 - Computer Science II](#)  
or
- [CSCE 1045 - Computer Programming II](#)
- [CSCE 2100 - Foundations of Computing](#)
- [CSCE 2110 - Foundations of Data Structures](#)

#### Geographic Information Systems, 18 hours

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- [GEOG 3500 - Introduction to Geographic Information Systems](#)
- [GEOG 4550 - Advanced Geographic Information Systems](#)
- [GEOG 4560 - Introduction to Python Programming](#)
- [GEOG 4570 - Special Topics in GIS](#)
- [GEOG 4590 - Advanced GIS Programming](#)

#### Plus 3 hours selected from:

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- [GEOG 4195 - Geospatial Data Analytics and Visualization](#)

- [GEOG 4230 - Location Intelligence: Business GIS Concepts and Applications](#)
- [GEOG 4580 - GIS in Health](#)

## Other program requirements

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An additional 15 hours are required in one of the tracks listed below. Blending courses from tracks requires advisor approval.

### Computer science, 15 hours

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- [CSCE 3110 - Data Structures and Algorithms](#)

#### Plus 12 hours selected from:

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- [CSCE 3850 - Introduction to Computational Life Science](#)
- [CSCE 4110 - Algorithms](#)
- [CSCE 4201 - Introduction to Artificial Intelligence](#)
- [CSCE 4205 - Introduction to Machine Learning](#)
- [CSCE 4230 - Introduction to Computer Graphics](#)
- [CSCE 4350 - Fundamentals of Database Systems](#)
- [CSCE 4380 - Data Mining](#)
- [CSCE 4810 - Biocomputing](#)
- [CSCE 4820 - Computational Epidemiology](#)

### Information technology, 15 hours

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- [CSCE 3055 - IT Project Management](#)
- [CSCE 3615 - Enterprise Systems Architecture and Design](#)

#### Plus 9 hours selected from:

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- [CSCE 3220 - Human Computer Interfaces](#)
- [CSCE 3420 - Internet Programming](#)
- [CSCE 3530 - Introduction to Computer Networks](#)
- [CSCE 3550 - Foundations of Cybersecurity](#)
- [CSCE 3600 - Principles of Systems Programming](#)
- [CSCE 3850 - Introduction to Computational Life Science](#)
- [CSCE 4350 - Fundamentals of Database Systems](#)
- [CSCE 4810 - Biocomputing](#)
- [CSCE 4820 - Computational Epidemiology](#)

## Electives

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Students should consult with their academic advisor on courses for electives or undergraduate certificates that enhance their career options.

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