GEOINFORMATICS AND GEOSPATIAL ANALYTICS, PH.D.

Students in Saint Louis University's geoinformatics and geospatial analytics doctoral program study the science and technology dealing with the acquisition, storage, processing production, presentation and dissemination of geoinformation using the theory and practical implications of geodesy within information science infrastructure.

The core of geoinformatics at SLU is geospatial analytics, a branch of data science that focuses on developing cutting-edge technologies supporting processes of acquiring, analyzing and visualizing geospatial Big Data. Advances in various location-aware technologies, (e.g., GPS, the Internet of Things (IoT), mobile sensors, remote sensing), and ever-increasing time-stamped, location-based data from sensors as diverse as satellites, drones and smartphones have created unprecedented demand and opportunities for code-savvy geospatial professionals with the ability to automate processing, visualizing and finding patterns in both structured and unstructured data.

Program Highlights

The geoinformatics and geospatial analytics Ph.D. program provides students with in-depth knowledge in geoinformatics and geospatial analytics required for solving today's grand challenges, e.g., climate change, public health, refugees and migration, transportation safety, and food, water and human security from local to global scales. The graduates of the Ph.D. program will gain the multidisciplinary knowledge and quantitative skills necessary to handle big geospatial data and solve big problems.

Curriculum Overview

This 45-credit Ph.D. program focuses on educating next-generation talent with advanced and emerging technologies like machine learning/AI, satellite geodesy, image analysis, change detection, GIS modeling, photogrammetry and automation that are critical to developing research skills to address today's grand societal challenges such as food security, healthcare delivery, national security and beyond with high impact research.

Admission Requirements

Successful applicants possess sufficient GPA and English proficiency scores (for international students) and research interests compatible with ongoing research in the department.

Geophysics Concentration

Prerequisites include structural geology, college physics, mechanics and mathematics through differential equations.

Environmental Geosciences Concentration

Prerequisites include an undergraduate degree in a STEM discipline with at least one semester each of calculus, physics, biology, chemistry and geoscience; a second semester of calculus or one semester of statistics.

Application Requirements

- Application form
- Three letters of recommendation
- Transcript(s)
- Professional goal statement
- Résumé

GRE scores are optional.

Requirements for International Students

All admission policies and requirements for domestic students apply to international students. International students must also meet the following additional requirements:

- Demonstrate English Language Proficiency (https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/)
- Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include:
  - Courses taken and/or lectures attended
  - Practical laboratory work
  - The maximum and minimum grades attainable
  - The grades earned or the results of all end-of-term examinations
  - Any honors or degrees received.
- WES and ECE transcripts are accepted.
- In order to be issued an I-20 for your F-1 visa application, students must submit financial documents. Proof of financial support that must include:
  - A letter of financial support from the person(s) or sponsoring agency funding the student's time at Saint Louis University
  - A letter from the sponsor's bank verifying that the funds are available and will be so for the duration of the student's study at the University

Application and Assistantship Application Deadlines

Students typically begin the program in the fall semester. Students who want to be considered for an assistantship must submit their applications by Jan. 2. Late applications and applications for the spring semester will be considered if positions are available.

Review Process

Faculty committee members examine qualified applicants' materials and make recommendations.

Tuition

Tuition	Cost Per Credit
Graduate Tuition	$1,370

Additional charges may apply. Other resources are listed below:

Net Price Calculator (https://www.slu.edu/financial-aid/tuition-and-costs/calculator.php)

Information on Tuition and Fees (https://catalog.slu.edu/academic-policies/student-financial-services/tuition/)

Miscellaneous Fees (https://catalog.slu.edu/academic-policies/student-financial-services/fees/)

Information on Summer Tuition (https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer/)

Scholarships, Assistantships and Financial Aid

For priority consideration for a graduate assistantship, apply by the program admission deadlines listed. Fellowships and assistantships provide a stipend and may include health insurance and a tuition scholarship for the duration of the award.

Explore Scholarships and Financial Aid Options (https://www.slu.edu/financial-aid/)

Requirements

The Geoinformatics and Geospatial Analytics Ph.D. is a 45-credit hour degree that includes a 21-credit core, 12 credits of electives, and 12 credits of dissertation research.

Code	Title	Credits
Core Requirements		
GIS 5030	Geospatial Data Management	3
GIS 5040	Introduction to Remote Sensing	3
GIS 5050	Digital Image Processing	3
GIS 5061	Photogrammetry	3
GIS 5080	Digital Cartography and Geovisualization	3
GIS 5090	Introduction to Programming for GIS and Remote Sensing	3
GIS 5120	Geospatial Analytics	3
Elective Courses		*12*
Students can choose among the following options:		
GIS 5010	Introduction to Geographic Information Systems	
GIS 5091	Advanced Programming for GIS and Remote Sensing	
GIS 5092	Machine Learning for GIS and Remote Sensing	
GIS 5100	Microwave Remote Sensing: SAR Principles, Data Processing and Applications	
GIS 5130	Human Geography	
GIS 5140	Satellite Geodesy	
CSCI 5750	Introduction to Machine Learning	
CSCI 5830	Computer Vision	
CSCI 5760	Deep Learning	
SOC 5670	Spatial Demography – Applied Spatial Statistics	
Dissertation Research		*12*
Students take 12 hours total over multiple semesters		
GIS 6990	Dissertation Research	
Total Credits		**45**

Continuation Standards

Students must maintain a cumulative grade point average (GPA) of 3.00 in all graduate/professional courses.

Roadmap

Roadmaps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Courses and milestones designated as critical (marked with !) must be completed in the semester listed to ensure a timely graduation. Transfer credit may change the roadmap.

This roadmap should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor/mentor each semester. Requirements, course availability and sequencing are subject to change.

Course	Title	Credits
Year One		
Fall		
GIS 5040	Introduction to Remote Sensing	3
GIS 5061	Photogrammetry	3
GIS 5090	Introduction to Programming for GIS and Remote Sensing	3
	Credits	**9**
Spring		
GIS 5030	Geospatial Data Management	3
GIS 5050	Digital Image Processing	3
GIS 5080	Digital Cartography and Geovisualization	3
	Credits	**9**
Year Two		
Fall		
GIS 5120	Geospatial Analytics	3
GIS Elective		3
GIS Elective		3
	Credits	**9**
Spring		
GIS Elective		3
GIS Elective		3
	Credits	**6**
Year Three		
Fall		
GIS 6990	Dissertation Research	3
	Credits	**3**
Spring		
GIS 6990	Dissertation Research	3
	Credits	**3**
Year Four		
Fall		
GIS 6990	Dissertation Research	3
	Credits	**3**
Spring		
GIS 6990	Dissertation Research	3
	Credits	**3**
	Total Credits	**45**

Contact Us

For more information about any School of Science and Engineering graduate program, email ssegrad-admissions@slu.edu.