BACHELOR OF SCIENCE IN GEOGRAPHIC INFORMATION SCIENCE

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The Bachelor of Science in Geographic Information Science is offered for students to gain expertise with geospatial technologies and related computer science and data analysis and apply those skills and knowledge to a content area. GIS, remote sensing, GPS, programming, spatial analysis, web publishing and mapping, data handling and analytics, are the components of the program as well as utilizing those skills and technologies to address and solve real-world problems.

COURSE	TITLE	S.H.
FIRST YEAR REQUIREMENT -STUDENT SUCCESS SEMINAR		
YSU 1500	Success Seminar	1-2
or YSU 1500S	Youngstown State University Success Seminar	
or HONR 1500	Intro to Honors	
GENERAL EDUCATION		
ENGL 1550	Writing 1	3-4
or ENGL 1549	Writing 1 with Support	
ENGL 1551	Writing 2	3
Mathematics General Education Requirement - met below		
Arts and Humanities General Education		6
Social Science General Education Electives		6
Natural Science plus Lab		7
General Education Electives		9
Choose One Math and Computer Path:		**12-14**
MATH 1513	Algebra and Transcendental Function	
CSIS 2610 & 2610L	Programming and Problem-Solving and Programming and Problem-Solving Lab	
STAT 2601	Introductory Statistics	
or STAT 2625	Statistical Literacy and Critical Reasoning	
OR (this path takes 14 hours)		
CSIS 1595 & 1595L	Fundamentals of Programming and Problem-Solving 1 and Fundamentals of Programming and Problem-Solving 1 Lab	
CSIS 2605 & 2605L	Fundamentals of Programming and Problem- Solving 2 and Fundamentals of Programming and Problem-Solving 2 Lab	
STAT 3717	Statistical Methods	
or STAT 3743	Probability and Statistics	
MATH 1570	Applied Calculus 1	
or MATH 1571	Calculus 1	
Required GIS Courses: 18 s.h.		
GIS 2610	Map Use and Interpretation	3
GIS 2611	Geospatial Foundations	3
or GIS 2611H	Honors Geospatial Foundations	
GIS 3701	Introduction to Geographic Information Science	3
GIS 3702	Introduction to Remote Sensing	3
GIS 4801	Advanced Geographic Information Science	3
GIS 4802	Advanced Remote Sensing	3
Required Additional Courses: 19 s.h.		
CSIS 3700 & 3700L	Data Structures and Objects and Data Structures and Objects Lab	4
CSIS 3701	Advanced Object-oriented Programming	3
DATX 5803	Data Visualization	3
ENGL 3743	Introduction to Public, Professional and Technical Writing	3
PHIL 4801	Data Ethics	3
Choose One Database Class:		3
CSIS 3722	Development of Databases	
DATX 5801	Data Management	
Electives - Choose 6 - at least 12 hours must come from GIS and/or STEM designation courses		18
GIS 3712	Thematic Map Design and Symbolization	
GIS 3781	Geographic Information Sciences Application for the Social Sciences	
GIS 3782	GIS Applications for the Natural Sciences	
GIS 3783	Geographic Information Science Applications to Urban and Regional Studies	
GIS 4840	Special Topics in GIS	
GIS 5812	GPS and GIS	
GIS 5820	Directed Research in GIS	
STEM 4890	STEM Internship (a Geospatial-based internship)	
BIOL 4802	Ecology of Lakes	
BIOL 4803	Stream Ecology	
BIOL 4866	Forest Ecology	
BIOL 4878	Conservation Biology	
BUS 3730	Advanced Excel and Business Analytics Tools	
CEEN 2610 & 2610L	Surveying and Surveying Laboratory	
CRJS 3710	Social Statistics	
CSIS 3726	Visual/Object-Oriented Programming	
CSIS 3737	Game Programming	
CSIS 3738	Graphics and Animation for Gaming	
CSCI 4851	Data Science and Machine Learning	
CSCI 4852	Deep Learning	
CSCI 4871	Cloud Computing and Big Data	
CSIS 5824	Applied Artificial Intelligence	
CSIS 5837	Artificial Intelligence in Game Design	
CSIS 5838	Graphics and Animation for Gaming	
DATX 5805	Predictive Modeling Algorithms	
DATX 5895	Selected Topics in Data Analytics	
DATX 5896	Data Analytics Project	
ECON 3735	Artificial Intelligence in Business	
ECON 3788	Advanced Business Analytics	
GEOL 4812	GIS Applications to Geology	
INFO 3774	Digital Image Processing	
MATH 3720	Linear Algebra and Matrix Theory	
STAT 4817	Applied Statistics	
Minor		**18**
Total Semester Hours		**120-124**

Year 1		
Fall		**S.H.**
YSU 1500 or YSU 1500S or HONR 1500	Success Seminar or Youngstown State University Success Seminar or Intro to Honors	1-2
ENGL 1550	Writing 1	3
MATH 1513 or MATH 1570 or MATH 1571	Algebra and Transcendental Function or Applied Calculus 1 or Calculus 1	5
Gen Ed Nat Sci 1 of 2 + Lab		4
Gen Ed Arts requirement 1 of 2		3
	Semester Hours	**16-17**
Spring		
CSIS 2610 & 2610L or CSIS 1595 ***and*** CSIS 1595L ***and*** CSIS 2605 ***and*** CSIS 2605L	Programming and Problem-Solving or Fundamentals of Programming and Problem-Solving 1 ***and*** Fundamentals of Programming and Problem-Solving 1 Lab ***and*** Fundamentals of Programming and Problem- Solving 2 ***and*** Fundamentals of Programming and Problem- Solving 2 Lab	4-6
GIS 2611	Geospatial Foundations	3
ENGL 1551	Writing 2	3
Gen Ed Nat Sci 2 of 2		3
Gen Ed Elective 1 of 3		3
	Semester Hours	**16-18**
Year 2		
Fall		
GIS 2610	Map Use and Interpretation	3
STAT 2601 or STAT 2625 or STAT 3717 or STAT 3743	Introductory Statistics or Statistical Literacy and Critical Reasoning or Statistical Methods or Probability and Statistics	3-4
Gen Ed Arts 2 of 2 requirement		3
Gen Ed elective 2 of 3		3
Gen Ed Social Science requirement 1 of 2		3
	Semester Hours	**15-16**
Spring		
GIS 3701	Introduction to Geographic Information Science	3
CSIS 3700 & 3700L	Data Structures and Objects and Data Structures and Objects Lab	4
CSIS 3701	Advanced Object-oriented Programming	3
Minor class 1 of 6		3
Social Science Gen Ed elective 2 of 2		3
	Semester Hours	**16**
Year 3		
Fall		
CSIS 3722 or DATX 5801	Development of Databases or Data Management	3
GIS 3702	Introduction to Remote Sensing	3
ENGL 3743	Introduction to Public, Professional and Technical Writing	3
Minor class 2 of 6		3
GIS elective 1 of 4		3
	Semester Hours	**15**
Spring		
GIS 4801	Advanced Geographic Information Science	3
DATX 5803	Data Visualization	3
PHIL 4801	Data Ethics	3
GIS elective 2 of 4		3
Minor class 3 of 6		3
	Semester Hours	**15**
Year 4		
Fall		
GIS Elective 3 of 4		3
Minor class 4 of 6		3
Minor class 5 of 6		3
Other elective in major 1 of 2		3
	Semester Hours	**12**
Spring		
GIS 4802	Advanced Remote Sensing	3
GIS elective 4 of 4		3
Gen Ed Elective 3 of 3		3
Minor class 6 of 6		3
Other elective in major course 2 of 2		3
	Semester Hours	**15**
	Total Semester Hours	**120-124**

Understand the fundamental principles and capabilities of geographic information science, including geospatial technologies, spatial data handling, and remote sensing.

Demonstrate proficiency in the use of geographic information science methods to effectively map, analyze, visualize, query, and manipulate spatial and non-spatial data.

Utilize geospatial and computer-based analytical methods to solve location-based problems and properly evaluate the results.