# Spatial Data Science and Technology (BA/BS)

Spatial data is integrated in our everyday lives. From geotagging to geocaching to finding a place to enjoy some coffee, we are all integrated in a complex web of movement, place, and discovery. Spatial data science and technology is not a program about making maps—it's about asking relevant questions, harnessing data, and understanding the appropriate way to use it. It's not just about learning how to use software programs, but about how you can contribute to a new generation of digital technologies that represent a high-growth industry—one that is revolutionizing business, nonprofit, and government worlds alike. At the UO, faculty members use spatial technologies to focus on remote sensing of river systems, climate change analysis, web-mapping, cartography, spatial cognition, spatial decision-making, and social equity.

This major is very flexible with four required courses in geography and computer science, and then eight electives that students can focus in their areas of interest. Our courses focus on geographic information systems science, cartography, remote sensing, spatial analysis, and spatial modeling.

## Program Learning Outcomes

Upon successful completion of this program, students will be able to:

The spatial data science and technology major requires a minimum of 48 credits, drawing on courses in geography and computer information science. The major requires four compulsory courses (16 credits) that provide foundational skills, concepts, and critical thinking abilities. An additional eight elective courses (32 credits) are required. Upon declaring the major, students meet with the geography undergraduate advisor to tailor a series of elective courses best suited to individual student needs and employment aspirations. At least nine courses used for the major must be taken for a letter grade. A grade of C– or better and a GPA of 2.25 or better is required in courses applied to the major.

For more information, e-mail the undergraduate advisor, Leslie McLees, at geogadvr@uoregon.edu, or schedule an advising appointment at https://geography.uoregon.edu/undergrad/advising/.

## Spatial Data Science and Technology Major Requirements

Core courses provide foundational skills, concepts, and critical thinking abilities. Some of the introductory courses, such as GIScience I (GEOG 481), are prerequisites for more advanced courses. Students are not required to complete these before moving to elective courses (except where prerequisites are required).

**Electives.** Rather than adopting a series of specializations, the electives component will remain flexible. Upon declaring the major, students should meet with the undergraduate advisor to work out a series of courses that best fit student needs and employment aspirations. A full list of elective courses can be found on the major page (https://geography.uoregon.edu/sdst/) on the department website.

| Code | Title | Credits |
|---|---|---|
| **Core Courses** | | |
| GEOG 181 | Our Digital Earth | 4 |
| GEOG 281 | The World and Big Data | 4 |
| GEOG 481 | GIScience I | 4 |
| CS 122 | Introduction to Programming and Problem Solving | 4 |
| **Elective Courses** | | |
| Choose courses totaling 32 credits from the following: | | 32 |
| GEOG 403 | Thesis | |
| GEOG 482 | GIScience II | |
| GEOG 485 | Remote Sensing I | |
| GEOG 490 | GIScience: [Topic] [1] | |
| GEOG 491 | Advanced Geographic Information Systems | |
| GEOG 493 | Advanced Cartography | |
| GEOG 494 | Spatial Analysis | |
| GEOG 495 | Geographic Data Analysis | |
| GEOG 498 | Geospatial Project Design | |
| CS 210 | Computer Science I | |
| CS 211 | Computer Science II | |
| 300- or 400-level course with a GEOG subject code not listed above | | |
| 400-level course with a CS subject code not listed above | | |
| **Total Credits** | | **48** |

[1] Special topics include courses that are offered less frequently, but also qualify for credit when offered under the course number GIScience: [Topic] (GEOG 490). Topics include Web Mapping, Server GIS, Qualitative Spatial Reasoning, and Spatial Simulation.

## Honors Programs

The Department of Geography offers an honors option for its majors. More information is available on the department website (https://geography.uoregon.edu/undergrad/honors/) or by contacting the undergraduate advisor, geogadvr@uoregon.edu.

## Four-Year Degree Plan

*The degree plan shown is only a sample of how students may complete their degrees in four years. There are alternative ways. Students should consult their advisor to determine the best path for them.*

## Bachelor of Arts in Spatial Data Science and Technology

| Course | Title | Credits Milestones |
|---|---|---|
| **First Year** | | |
| **Fall** | | |
| GEOG 181 | Our Digital Earth | 4 |
| WR 121Z | Composition I | 4 |
| General-education course in arts and letters that also satisfies multicultural requirement | | 4 |
| First term of first-year second-language sequence | | 5 |
| | **Credits** | **17** |
| **Winter** | | |
| GEOG 281 | The World and Big Data | 4 |
| WR 122Z | Composition II | 4 |
| Group-satisfying course in social science | | 4 |
| Second term of first-year second-language sequence | | 5 |
| | **Credits** | **17** |

| | | |
|---|---|---|
| **Spring** | | |
| CS 122 | Introduction to Programming and Problem Solving | 4 |
| Group-satisfying course in arts and letters | | 4 |
| General-education course in social science that also satisfies multicultural requirement | | 4 |
| Third term of first-year second-language sequence | | 5 |
| | **Credits** | **17** |
| | **Total Credits** | **51** |

| Course | Title | Credits | Milestones |
|---|---|---|---|
| **Second Year** | | | |
| **Fall** | | | |
| GEOG 481 | GIScience I | 4 | |
| General-education course in arts and letters | | 4 | |
| General-education course in science | | 4 | |
| First term of second-year second-language sequence | | 5 | |
| | **Credits** | **17** | |
| **Winter** | | | |
| General-education course in arts and letters | | 4 | |
| Elective coursee in spatial data science and technology | | 8 | |
| Second term of second-year second-language sequence | | 5 | |
| Consider studying abroad | | | |
| | **Credits** | **17** | |
| **Spring** | | | |
| Elective course in spatial data science and technology | | 4 | |
| Elective courses | | 8 | |
| Third term of second-year second-language sequence | | 5 | |
| | **Credits** | **17** | |
| | **Total Credits** | **51** | |

| Course | Title | Credits | Milestones |
|---|---|---|---|
| **Third Year** | | | |
| **Fall** | | | |
| Elective course in spatial data science and technology | E | 4 | |
| Group-satisfying course in science | | 4 | |
| Upper-division elective courses | | 8 | |
| | **Credits** | **16** | |
| **Winter** | | | |
| Elective course in spatial data science and technology | | 4 | |
| General-education course in social science | | 4 | |
| General-education course in science | | 4 | Investigate summer internships |
| Upper-division elective course | | 4 | |
| | **Credits** | **16** | |
| **Spring** | | | |
| Elective course in spatial data science and technology | | 4 | |
| Upper-division elective course | | 4 | |
| Multicultural course | | 4 | |
| Elective course | | 4 | |
| | **Credits** | **16** | |
| | **Total Credits** | **48** | |

| Course | Title | Credits | Milestones |
|---|---|---|---|
| **Fourth Year** | | | |
| **Fall** | | | |
| Elective course in spatial data science and technology | | 4 | |
| Upper-division elective courses | | 8 | |
| Multicultural course | | 4 | |
| | **Credits** | **16** | |
| **Winter** | | | |
| Elective course in spatial data science and technology | | 4 | |
| Upper-division elective course | | 4 | Apply for graduation on DuckWeb |
| Elective course | | 4 | |
| Start a job search with geography academic career advisor | | | |
| | **Credits** | **12** | |
| **Spring** | | | |
| Upper-division elective course | | 4 | |
| Elective courses | | 8 | |
| | **Credits** | **12** | |
| | **Total Credits** | **40** | |

## Bachelor of Science in Spatial Data Science and Technology

| Course | Title | Credits | Milestones |
|---|---|---|---|
| **First Year** | | | |
| **Fall** | | | |
| GEOG 181 | Our Digital Earth | 4 | |
| WR 121Z | Composition I | 4 | |
| General-education course in arts and letters that also satisfies multicultural requirement | | 4 | |
| Mathematics course | | 4 | |
| | **Credits** | **16** | |
| **Winter** | | | |
| GEOG 281 | The World and Big Data | 4 | |
| WR 122Z | Composition II | 4 | |
| Group-satisfying course in social science | | 4 | |
| Mathematics course | | 4 | |
| | **Credits** | **16** | |
| **Spring** | | | |
| CS 122 | Introduction to Programming and Problem Solving | 4 | |
| Group-satisfying course in arts and letters | | 4 | |
| General-education course in social science that also satisfies multicultural requirement | | 4 | |

| | | | |
|---|---|---|---|
| Mathematics course | | | 4 |
| | **Credits** | | **16** |
| | **Total Credits** | | **48** |

| Course | Title | Credits | Milestones |
|---|---|---|---|
| **Second Year** | | | |
| **Fall** | | | |
| GEOG 481 | GIScience I | 4 | |
| General-education course in arts and letters | | 4 | |
| General-education course in social science | | 4 | |
| General-education course in science | | 4 | |
| | **Credits** | **16** | |
| **Winter** | | | |
| Elective courses in spatial data science and technology | | 8 | |
| General-education course in arts and letters | | 4 | |
| General-education course in social science | | 4 | |
| | **Credits** | **16** | |
| **Spring** | | | |
| Elective course in spatial data science and technology | | 4 | |
| General-education course in social science | | 4 | |
| General-education course in science | | 4 | |
| Elective course | | 4 | |
| | **Credits** | **16** | |
| | **Total Credits** | **48** | |

| Course | Title | Credits | Milestones |
|---|---|---|---|
| **Third Year** | | | |
| **Fall** | | | |
| Elective course in spatial data science and technology | | 4 | |
| Group-satisfying course in science | | 4 | |
| Upper-division elective courses | | 8 | |
| | **Credits** | **16** | |
| **Winter** | | | |
| Elective course in spatial data science and technology | | 4 | |
| General-education course in social science | | 4 | |
| General-education course in science | Investigate summer internships | 4 | |
| Upper-division elective course | | 4 | |
| | **Credits** | **16** | |
| **Spring** | | | |
| Elective course in spatial data science and technology | | 4 | |
| Upper-division elective course | | 4 | |
| Multicultural course | | 4 | |
| Elective course | | 4 | |
| | **Credits** | **16** | |
| | **Total Credits** | **48** | |

| Course | Title | Credits | Milestones |
|---|---|---|---|
| **Fourth Year** | | | |
| **Fall** | | | |
| Elective course in spatial data science and technology | | 4 | |
| Upper-division elective courses | | 8 | |
| Multicultural course | | 4 | |
| | **Credits** | **16** | |
| **Winter** | | | |
| Elective course in spatial data science and technology | | 4 | |
| Upper-division elective course | Apply for graduation on DuckWeb | 4 | |
| Elective course | | 4 | |
| Start a job search with geography academic career advisor | | | |
| | **Credits** | **12** | |
| **Spring** | | | |
| Upper-division elective course | | 4 | |
| Elective courses | | 8 | |
| | **Credits** | **12** | |
| | **Total Credits** | **40** | |