

# SPATIAL DATA SCIENCE

## Degree Requirements

### Master of Science (M.S.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://gradschool.psu.edu/graduate-education-policies/>)

A minimum of 33 credits at the 400, 500, 600, or 800 level is required. At least 18 credits must be in 500- or 600-level courses. Students choosing to complete a thesis must complete a minimum of 36 credits, with at least 6 credits in thesis research (GEOG 600 or GEOG 610). Students choosing to complete a capstone course must complete at least 18 credits in 500-level courses, including 3 credits in GEOG 570 Capstone in Spatial Data Science.

Code	Title	Credits
<b>Required Courses</b>		
Complete the following 5 required courses that total 15 credits with a grade point average of 3.00 or higher:		
GEOG 485	GIS Programming and Software Development	3
GEOG 486	Cartography and Visualization	3
GEOG 580	GEOVISUAL ANALYTICS	3
GEOG 583	Geospatial System Analysis and Design	3
GEOG 586	Geographical Information Analysis	3
<b>Electives</b>		
Complete a minimum of 9 credits of Spatial Data Science Methods		9
electives in 400-, 500-, or 800-level courses. The courses that will satisfy this requirement can be chosen from a list of approved courses maintained by the graduate program office.		
Complete a minimum of 6 credits of Spatial Data Science		6
Applications electives in 400-, 500-, or 800-level courses. The courses that will satisfy this requirement can be chosen from a list of approved courses maintained by the graduate program office.		
<b>Culminating Experience</b>		
A capstone course or thesis must be completed to meet the specific requirement of the culminating experience. The capstone course will demonstrate analytical thinking and synthesis of knowledge in the field of spatial data science. The thesis will demonstrate original research in the field of spatial data science to their adviser, a second reader, and the director of the SDS graduate program.		
Choose one of the following depending on whether a capstone course or thesis is completed:		
GEOG 570	Capstone in Spatial Data Science (Capstone Course)	3
GEOG 600	Thesis Research (Thesis)	6
or GEOG 610	Thesis Research Off Campus	
<b>Total Credits</b>		<b>33-36</b>

Candidates may choose a capstone course or thesis option to fulfill their culminating experience requirement and demonstrate integration of knowledge and research experience acquired during their time in the spatial data science degree program. Students who choose the capstone course option must complete a work product advised by a Graduate Faculty member that demonstrates analytical thinking and synthesis of knowledge in the field of spatial data science. Students choosing the capstone course option will register for 3 credits of GEOG 570 Capstone

in Spatial Data Science. Students will be encouraged to utilize an industry internship or current employer to identify a relevant or practical problem of importance that spatial data science methods could address, and to advance the state of the art in order to solve that problem. Students will be required to produce a paper and to present their results. The quality of the required paper is such that it must be suitable for publication in a professional journal or proceedings at a national or international conference.

Candidates who choose the thesis option must write and defend, at an oral examination, a thesis based upon original research in the field of spatial data science. The thesis will demonstrate depth of knowledge to their adviser, a second reader, and the director of the SDS graduate program. Candidates must submit a thesis following the procedures specified by the Graduate School and register for 6 credits of GEOG 600/GEOG 610. The thesis must be accepted by the adviser and committee members, the head of the graduate program, and the Graduate School, and the student must pass the thesis defense. Students who choose the thesis option for their culminating experience are expected to take two years to complete the degree.

### Complementary Electives

Students in the SDS program may take individual courses outside of Geography as electives if approved by the SDS program director.