Spatial Data Science and Technology: Assessment Plan
March 2018

Learning Objectives

1. Exhibit a general understanding of the geographic and mathematical foundations of spatial data science and technologies.
2. Demonstrate knowledge of the geographic context of technology infrastructure, geographic data needs, and technology interface design and therefore have the potential to contribute to the development of geospatial data and technologies.
3. Understand the societal implications of geospatial data and technologies, including issues surrounding privacy and security of individual-level data containing locational information, the types of inequalities that certain geospatial technologies produce, and the role that geospatial technologies play in humanitarian crises.
4. Utilize geospatial data and technologies for collecting data, employ analytical and visualization methods for interpreting such data, and communicate effectively to a range of audiences.

Assessment for 2018-2019

Assessment for the first cohort of majors in the SDST program will involve objective #4. Assessment will be achieved by linking learning objectives to grading rubrics for class projects. Several courses include class projects with goals that span more than one of our learning objectives. Instructors of these courses will be using a rubric to assess that students have obtained the necessary skills and knowledge outlined in our expected learning outcomes. Courses with projects that link especially well with learning objective four are:

- Geog 496: "Location-aware systems". In this project-oriented course, students first learn about a set of technologies not yet covered in other courses. In order to quickly understand these, they need to employ their foundational knowledge and knowledge about core technologies. They then do further research to develop an idea, which they communicate with a project proposal. They finally go through all steps of planning and execution of a project with a limited time frame, which also entails reacting flexibly to unforeseen challenges.

- Geog 493: "Advanced Cartography" The final class project and presentation, used to assess the knowledge and skill students have gained in the course, counts for 40% of the course grade. The learning objectives for the class address objectives #2 and #4. All 10 parts of the grading rubric for the final project relate to objective #4.

- Geog 495: "Geographic data analysis" The take-home exams contain essay questions what ask students about strategies for analyzing general forms of data, and how to communicate the analysis to collaborators or a supervisor. This is a core skill to test for objective #4.

- Geog 419: "The Professional Geographer". This class is required for the Geography major and is open to SDST students; most SDST students will take it. In this class students produce final portfolios that are meant to present their final projects and wrap up their skills, projects, and experiences into a cohesive document. The portfolio introduces the problem of interest, presents the analyses performed, and describes the real-world significance they found, and

finally addresses the implications they might have for both the analysis and the initial problem.

Additional methods by which the learning outcomes will be assessed and used to improve curriculum and instruction.

- We will expand our current efforts to survey students in our existing geospatial data and technology-related courses at the end of each term. In addition to university-administered course evaluations, we recently began to survey students to evaluate if course curriculum was providing adequate opportunities to learn how to use geospatial data and technologies in meaningful ways. We will enhance these survey efforts to evaluate our performance across all courses in this program to ensure that students themselves agree that they are meeting our expected learning outcomes.
- We will track graduates of our program to determine the number of students receiving employment in the geospatial data and technology industry, what skills acquired in the program are being used in their employment, and what skills needed in their employment that they did not receive in our program.
- We will maintain contact with program graduates in the geospatial data and technology industry to solicit feedback regarding the ways in which our program could change to meet potential changing needs of the industry.

Assessment Processes
Grading rubrics will be used to assess projects in the three above classes. The other three Learning Objectives will be assessed, beginning AY 2019-2020 as identified in the proposed timeline below.

Learning Objective	AY 2018-19	AY 2019-20	AY 2020-21	AY 2021-22	AY 2022-23
LO1		X		X	
LO2		X		X	
LO3			X		X
LO4	X		X		X