Spatial Analysis and Visualization Initiative
GIS and Design Certificate Program: Fall 2014

Pratt Institute’s Spatial Analysis and Visualization Initiative (SAVI) is launching a GIS and Design Certificate program this fall. We will run four courses and two workshops this semester as we build towards offering a full, for-credit program.

Developed in collaboration with the Pratt Center for Continuing and Professional Studies, this certificate offers a rigorous grounding in the principles of spatial thinking and visual design. Students in our program learn to explore and analyze data, develop technical mapping skills, and apply visual design principles in the context of spatial analysis.

For more information please contact savi@pratt.edu.

Program Overview
Mapping is transforming how we communicate and interpret data. Creative professionals, designers, developers, programmers, architects, and planners are increasingly using maps to engage diverse communities and build innovative solutions to real world problems. Pratt’s Geographic Information Systems (GIS) and Design Certificate Program gives students the tools to make compelling, data-driven maps and visualizations.

In addition to learning how to properly assess and analyze spatial data in a traditional desktop GIS environment, online mapping and web design are a core component of the Certificate. All Certificate students will learn the principles of design for the web, interactive design, user experience, and the technical underpinnings of online mapping.

Our courses cover a range of online GIS products and open source mapping tools. More advanced students, particularly those with a background in programming and web development, will have the opportunity to build dynamic web-based maps and work with programming languages like Python, Processing and JavaScript (including D3). By the end of the Certificate Program students will emerge with an online portfolio demonstrating their ability to make visually sophisticated maps based on thorough, accurate analysis.

GIS and Design Certificate coursework is collaborative and multi-disciplinary. Students in our courses work on innovative projects with instructors and students from across Pratt Institute, including Graduate Communications Design and the Programs for Sustainable Planning and Development (PSPD). Course projects give our students the opportunity to bring their diverse backgrounds to bear on research and problem solving. For example, students will be able to take advantage of Pratt’s long history of community development by working with local organizations on real world projects. Students may choose to take individual classes or enroll in the full Certificate Program.

Why Choose Pratt Institute?
- As an internationally recognized school of art, design, and architecture, Pratt Institute offers GIS and Design Certificate students the opportunity to take advantage of our diverse faculty and interdisciplinary focus.
- GIS and Design Certificate Program faculty are practicing professionals in mapping and digital media who are drawn from across New York City and from within Pratt Institute.
- The GIS and Design Certificate Program is a product of Pratt’s Spatial Analysis and Visualization Initiative (SAVI), a new center to foster a GIS-centered learning and research community. Students in our program will have access to advanced software and a community of spatial and information design professionals.

Certificate Requirements
The certificate program requires the successful completion of 180 hours of study. Successful completion includes 120 hours of required study and 60 hours of study in elective courses.

Certificate Students must discuss their planned electives with the Program Director and receive approval for the proposed course of study.
Curriculum

Required Core Courses: 3 courses equaling 120 hours of study
XSAVI-700 Foundations: Spatial Thinking, Data, and Design (30 hours)
XSAVI-701 Introduction to GIS Tools and Software (45 hours)
XSAVI-800 Advanced GIS (45 hours)

Electives*: A combination equaling 60 hours of study
XSAVI-710 Critical Data Acquisition and Assessment: Open Data Focus (6 hour workshop)
XSAVI-711 Introduction to GIS and Mobile Data Applications (12 hour workshop)
XSAVI-712 Citizen-science data collection and analysis (12 hour workshop)
XSAVI-713 GIS for Architects: Integrating 3D (12 hour workshop)
XSAVI-714 Integrating GIS and Art (12 hour workshop)
XSAVI-715 GeoHumanities (12 hour workshop)
XSAVI-750 Mining the Web: How to Scrape, Analyze, and Map Open Data (30 hours)
XSAVI-751 Data-Driven Decision-making: Demographic Analysis & Socioeconomic Trends (30 hours)
XSAVI-752 GIS for Programmers and Web Developers (30 hours)
XSAVI-754 Mapping Climate Change, Natural Disasters, & Environmental Data (30 hours)
XSAVI-780 Interactive Web Mapping, Programming and Design (45 hours)
XSAVI-810 Programming for ArcGIS (30 hours)
XSAVI-811 GIS and Mobile Data Applications (45 hours)
XSAVI-815 Advanced Cartographic Design and Visualization for GIS (45 hours)
XSAVI-850 Internship or Project (30 hours)
XSAVI-851 Practicum (30 hours)
XSAVI-854 Advanced Spatial Statistics (45 hours)

Fall 2014 Courses

Foundations: Spatial Thinking, Data, and Design
Learn to tell stories with maps and data. There’s more than meets the eye when it comes to creating accurate, compelling visualizations based on GIS analysis. This course introduces the critical fundamentals of spatial theory, cartography, design, and data visualization. You will acquire the skills to properly assess and analyze spatial data and maximize the message of your map output through engaging design.

Topics Include: Theories of spatial relationships, cartography and map design, assessing data quality, types and sources of data available, and information visualization.

T/Th 6 PM – 9 PM
10 sessions Sept 9 – Oct 9
XSAVI-700 30 hours

Mining the Web: How to Scrape, Analyze & Map Open Data
Data is all around us. There are now seemingly unlimited datasets on the web but they aren’t always easy to obtain. And, social media is generating new kinds of data that can be analyzed spatially. You too can conquer the world “wild” web and create sophisticated maps and visualizations. Through a course project you will mine open data from a variety of platforms and experiment with different mapping/visualization techniques; while also learning how to critically assess the utility and accuracy of data.

Topics Include: Scraping data from social media/online platforms, analyzing large datasets, assessing data quality, working with mapping software and programming languages (may include: OpenRefine, Python, HTML, MapBox, QGIS and more).

Sa 9 AM – 5 PM
4 sessions Sept 6 – Sept 27
XSAVI-750 30 hours

GIS for Programmers and Web Developers
Do you know what the Modifiable Areal Unit Problem is? If not, you might be creating beautiful but inaccurate map visualizations. Supplement your valuable programming and web development skills by establishing a firm grasp of core GIS concepts, the principles of spatial representation, and best practices for acquiring and assessing geographic data. You will experiment with GIS data in an open source platform and you’ll learn how to migrate GIS output to the programming platform of your choice.

Topics Include: Introduction to spatial theories, working with
GIS data, comparing the reliability of data sources, creating online maps. Working with QGIS, Geoda, web mapping platforms like CartoDB or MapBox, and open data portals.

Sa 10 AM – 4 PM
5 sessions Oct 11–Nov 8
XSAVI–752
30 hours

**Interactive Web Mapping, Programming and Design**

Another day, another beautiful web map in your blog feed. Want to know the secrets behind all those amazing maps? This course will give you the skills to build dynamic web-based maps and data visualizations. You will learn the principles of GIS, design for the web, interactive design, and user experience. By the end of the course, you will be able to work with programming languages like Python, Processing or JavaScript (D3) and online mapping platforms in order to create professional looking interactive maps and map-based charts and graphics.

**Topics Include:** Principles of GIS, design for the web and user experience. Each semester a suite of tools will be introduced from this list: QGIS, programming language (D3, Processing, Python, or other JavaScript), web mapping tools (CartoDB, TileMill, and/or MapBox), and Adobe Creative Suite.

T/Th 6 PM – 9 PM
15 sessions Oct 21–Dec 11
XSAVI–780
45 hours

**Fall 2014 Workshops**

**Critical Data Acquisition & Assessment: Open Data Focus**

Learn rigorous, professional methods for working with open data and large datasets. This 6-hour workshop provides an intensive overview of data acquisition and assessment techniques. You will learn what questions to ask when acquiring data, how to obtain a wide variety of datasets, and how to think critically about data quality. By the end of the workshop you will have a firm grounding in how to apply these techniques in visual analysis outputs and web maps.

**Topics Include:** Working with large datasets, evaluating data quality and accuracy, and documenting data sources and methods, open data sources, acquiring data.

Sa 10 AM – 4 PM
1 session Sept 6
XSAVI–710
6 hours

**Introduction to GIS and Mobile Data Applications**

The prospect of creating a mobile data application for your organization can be overwhelming. Dip your toes in the water through this two day workshop. You will be introduced to existing options for mobile data collection and how those apps are structured. Important considerations when choosing a platform and programming options will also be discussed. You will have the opportunity to experiment with customizing a mobile application through code and creating a web map of field collected data.

**Topics Include:** Using ArcGIS, QGIS, Java, and/or JavaScript to analyze data collected with mobile devices, assessing and choosing mobile application software, integrating basic programming into online mapping applications.

Sa 10 AM – 4 PM
2 sessions Nov 15, Nov 18
XSAVI–711
12 hours

**Registration**

To register, see the Pratt Center for Continuing and Professional Studies [website](#). Enter “XSAVI” in the course search box.

Please note there is a non-refundable $100 application fee for students wishing to enter the full certificate program.

**About SAVI**

Established in 2013, the Spatial Analysis and Visualization Initiative (SAVI) is a Geographic Information Systems (GIS)-centered initiative that provides Pratt students, faculty, and community-based organizations access to GIS and visualization resources, including equipment, databases, technical assistance, workshops, training sessions and researchers. A joint endeavor of the Programs for Sustainable Planning and Development (PSPD), the Pratt Center for Community Development, and the Graduate Communications Design Department, SAVI aims to promote a collaborative learning and research community at Pratt where faculty and students can share projects, ideas, resources and tools.

In keeping with Pratt’s commitment to benefit the greater community of which it is a part, SAVI also provides New York City-based nonprofit, civic, and community-based planning organizations (including Community Boards) with the latest mapping, data, and spatial information technology; access to GIS technical assistance, analysis, and data display interns; and the training and access to resources that allow independent GIS work. These groups will be able to efficiently document existing conditions of urban areas, more meaningfully contribute to policy discussions, and create their own visions for improving quality-of-life and sustainability.