ADVANCED GIS: Seminar in Spatial Analysis

Columbia University | GSAPP | Planning A6232
Spring 2015 | Mondays & Wednesdays 4-6pm | 200 Fayerweather

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01 | COURSE OVERVIEW

This research seminar is meant to provide students with advanced analytical and practical skills in Geographic Information Systems (GIS) and Spatial Analysis. In addition, the seminar also aims to teach students how to identify and frame unique research questions, how to develop a methodology for answering those questions and how to visually represent their research and findings. Finally, the class also seeks to introduce students to new techniques in mapping and collecting existing data.

Given the research seminar focus, the course will be centered around a final research paper and presentation. Working in groups of two, students will develop and frame their own research topics and questions and construct an adequate methodology using spatial analysis and advanced GIS techniques. In addition, during the whole semester students will be encouraged to work thoroughly on their graphic and presentation skills. Finally, students seeking to test potential thesis topics having a spatial component will be able to use this research seminar as a testing ground for their hypothesis and techniques.

02 | ADVANCED TOPICS

02.1 | Developing Research Questions

02.2 | Public Participation, Web-Mapping and APIs

02.3 | Surface Modeling

02.4 | Spatial Statistics

02.5 | Remote Sensing

02.6 | Decision Support

02.7 | Transportation and Land-Use

02.8 | Scripting

02.9| Data Visualization

03| EVALUATION AND GRADING

- 5% Attendance
- 10% Class participation and discussions
- 30% Individual assignments
- 15% Project proposal (midterm presentation, 5 - 10 minutes)
- 40% Final project (final presentation and paper, 10 minutes)

04 | RESOURCES AND MATERIALS

Course files, tutorials and presentations will be located on the X-Drive. This drive also contains the GIS data available to all GSAPP students. Students are encouraged to explore the data that already exists in the drive and if necessary, use it in their projects. In addition, students should also contact the Digital Social Science Center (DSSC) located in Lehman Library (SIPA) for extra information and data.

The readings for the class will be duly uploaded to Courseworks. Similarly, students will be required to submit their assignments by uploading them to Courseworks. Finally, the class will also rely heavily on submissions to the blog. Students will be required to upload some of their own work as well as inspirational material, encouraging and developing a critical stance and visual skills.

05 | SCHEDULE

Week 1 (Jan 21)	Introduction, course administration, syllabus
Week 2 (Jan 26 & Jan 28)	Scripting: basic Python and APIs
Week 3 (Feb 2 & Feb 4)	Scripting: basic Python and APIs
Week 4 (Feb 9 & Feb 11)	Scripting: acrpy and scripting in ArcGIS - Feb. 11: APIs review
Week 5 (Feb 16 & Feb 18)	Webmapping and ppGIS - Feb. 15: Final project proposal due - Feb. 15: Scripting in ArcGIS assignment due
Week 6 (Feb 23 & Feb 25)	Spatial analysis and statistics 1 - Feb. 22: Webmapping assignment due
Week 7 (Mar 2 & Mar 4)	Spatial analysis and statistics 2 - Mar. 1: Spatial statistics assignment 1 due
Week 8 (Mar 9 & Mar 11)	Remote sensing and midterm presentations - Mar. 8: Spatial statistics assignment 2 due - Mar. 11: Midterm presentations
Week 9 (Mar 16 & Mar 18)	Spring break (no class)
Week 10 (Mar 23 & Mar 25)	Surface modeling
Week 11 (Mar 30 & Apr 1)	Network analysis and transportation planning - Mar. 29: Surface modeling assignment due
Week 12 (Apr 6 & Apr 8)	Model builder - Apr. 5: Network analysis assignment due
Week 13 (Apr 13 & Apr 15)	Spatial relationships and regressions - Apr. 12: Model builder assignment due
Week 14 (Apr 20 & Apr 22)	Work in class (final project development) - Apr. 19: Spatial regression assignment due
Week 15 (Apr 28 & Apr 30)	Work in class (final project development)
Week 16 (May 4 & May 6)	Final presentations and final paper due - May 4th: Final presentations - May 6th: Final paper due