

## GEOG 413 / GEOG 613 – Advanced GIS

### Syllabus - Winter 2019

**Instructor:** Dr. Joseph Shea ([joseph.shea@unbc.ca](mailto:joseph.shea@unbc.ca)), Office hours: Tues 0900 – 1000, Room 8-142

**Lectures:** Tuesdays, 1000 – 1050, Room 5-173

**Lab Instructor:** Ping Bai ([baip@unbc.ca](mailto:baip@unbc.ca)), Office 10-2526, office hours by request.

**Labs:** Mondays and Wednesdays, 1130 – 1420, Room 8-125

**Website:** [www.gis.unbc.ca/courses/GEOG-413](http://www.gis.unbc.ca/courses/GEOG-413)

**Course Objectives:** Geographic information (GI) surrounds us and is a critical component of everyday life. This lab-based course will provide students with technical skills in a range of advanced GI system applications. A final lab project will develop independent research and GI presentation skills. Students will also develop their written and oral communication skills through a student-led seminar and term paper based on a specific GIS technique or tool and applications of that technique.

#### Course Evaluation:

Lab Assignments	40% (See lab schedule)
Final Project	20%
Final Project Presentation	5% (in lab on 3 April)
Final Paper	20% (Due 4 April)
Seminar	15% (Finalize topic by 22 January, submit draft for review by 5 March)
<b>Total:</b>	<b>100%</b>

#### Course Schedule:

Week	Topic	Labs/Assignment	Instructor
1 Jan	No Lecture	3 Jan: Review	Bai
7 Jan	Introduction, syllabus, geospatial data	Data management Spatial analysis	Bai Bai
15 Jan	Spatial data analysis	Factor rating Site selection	Bai Bai
21 Jan	Digital elevation models, hydrological modelling	Surface analysis Hydrology	Bai Bai
28 Jan	Demographics, economics	Demographic analysis Statistical analysis	Bai Bai
4 Feb	Risk/hazard analysis	Cost surface analysis Risk and accessibility	Bai Bai
11 Feb	Network analysis	Urban Planning Landuse	Bai Bai
<b>18 Feb</b>	<b>READING WEEK – no class</b>	<b>No labs</b>	
25 Feb	LiDAR data, point clouds	LiDAR Scripting	Bai Bai

4 Mar	Big Data, Open Data	Data structure Spatial data management	Emmons Emmons
11 Mar	UAVS: Sensors and Applications	Spatially enabled databases Project	Emmons Bai
18 Mar	GeoWeb (Emmons)	Project Project	Bai
25 Mar	Open source GIS	Project Project	Bai
1 Apr	Summary Discussions	Project Project presentations in lab	Bai

### Final Paper and Research Seminar

The objectives of the paper (20% of your final mark) and seminar (15% of your final mark) are to

- 1) provide an overview of an advanced GIS tool or technique
- 2) identify and present interesting case studies or examples from peer-reviewed literature
- 3) discuss opportunities and limitations of the technique

GEOG413 students should summarize three case studies taken from peer-reviewed literature, and GEOG613 students should describe five. GEOG613 students should additionally explore and discuss open-source alternatives to the GI tool (e.g. QGIS, GRASS, Python). Both the paper and seminar will be graded according to the rubric given below.

Submit a draft paper by 5 March for constructive feedback!

*Some general writing tips:* Start with an outline. What sections/subsections do you need? Use your library and librarians to help you search peer-reviewed literature. Put everything in your own words. Cite ideas/facts that are not your own, and use a consistent reference style in the text (e.g. Shea et al., 2018) and the reference section (e.g. Harvard).

*Final paper guidelines:*

- 12 point font, 1.5 line spacing
- Conceptual figures or flow charts that summarize the technique are encouraged
- Figures can (and should) be reproduced, with credit given in the caption.
- Use headings and subheadings to outline your paper.
- GEOG413: 2000 words *maximum*
- GEOG613: 3000 words *maximum*

*Some general presentation tips:* Keep the text to a minimum. Use figures, photos, conceptual diagrams. Budget around one slide per 1-2 minutes. Speak loudly, clearly, and slowly (if you tend to rush words together). Find interesting examples, and be enthusiastic.