

GEOG 2220B – Geographic Information Science I

Course Syllabus Winter 2019

1. Course Information

- Classroom Location:

Class Location and Time:

Lecture: Tuesdays, 2:30-4:30, SSC 2028

Labs: Tuesdays, 9:30-11:30, SSC 1059
Wednesdays, 9:30-11:30, SSC 1059
Thursdays, 9:30-11:30, SSC 1059

Additional lab drop-in: Mondays, 10:00-11:00, SSC 1059

- Contact Information:

Instructor:

Dr Agnieszka Leszczynski

Office: SSC 2413

Office Hours: Tuesdays 1-2 (or by appointment)

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Teaching Assistants:

Chantal Francoeur (Tuesdays; every second Thursday): cfranco5@uwo.ca

Lauren Banks (Tuesdays; every second Thursday): lbanks26@uwo.ca

Armin Ahmadi (Wednesdays; every second Thursday): aahma2@uwo.ca

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Lab Support:

Kathy Tang: ktang28@uwo.ca

Karen Vankerkhoerle: kvanker@uwo.ca

2. Calendar Description

- Course Description

An introduction to the nature of geographical data and the application of quantitative and statistical techniques and computing systems to spatial analysis; models of spatial data, probability, distributions, hypothesis testing and correlations.

2 lecture hours per week, 2 lab hours per week, 0.5 course

Prerequisite(s): 1.0 course from Geography 1100, Geography 1300A/B, Geography 1400F/G, Geography 1500F/G, Geography 2131A/B, Geography 2153A/B, Environmental Science 1021F/G; or enrolment in the Major in Physical Geography or in an Honors Earth Science Program for Professional Prerequisite(s): 1.0 course from Geography 1100, Geography 1300A/B, Geography 1400F/G, Geography 1500F/G, Geography 2131A/B, Geography 2153A/B, Environmental Science 1021F/G; r registration in a module in Science or in Engineering, in the Major in Physical Geography, or in the Commercial Aviation Management program in MOS.

- Senate Regulations

Senate Regulations state, “unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.”

3. Textbook

We will be using two texts:

- Bolstad, P. (2016) GIS Fundamentals: A First Text on Geographic Information Systems, 5th ed. XanEdu.
- Schuurman, N. (2004) GIS: A Short Introduction. Wiley-Blackwell.

You will also require the Geography 2220 **Lab Manual**, which will be provided to you as a digital PDF.

4. Course Objectives and Format

This course introduces students to both theoretical and applied foundations of Geographic Information Science. The objectives of the course are to:

- Familiarize students with the basic conceptual principles that underlie spatial data representation, handling, processing, and analysis in the digital environment of GIS (geographic information systems).
- Give students the opportunity to develop practical spatial data handling and analysis skills through hands-on GIS labs that guide students through a series of applied problem-solving tasks which demonstrate and implement the conceptual gleaned in lectures.

5. Learning Outcomes

Students who complete Geography 2220 will be able to:

- Understand in overview the fundamentals of geographic information, data models that underlie digital spatial representation, and how it is that spatial data are captured, stored, used, and disseminated;
- Identify and understand basic spatial data analysis methods, as well as the appropriateness of utilizing specific methods across different datasets and application contexts;

- Demonstrate a basic level of independent practical proficiency in handling, processing, analyzing, and representing spatial data in a digital software environment such as a GIS;
- Describe the principles that underlie positioning, positioning systems and map projections; and
- Understand some of the characteristics, availability, limitations, and potential pitfalls of using geospatial information across various domains of application.

6. Course Schedule

Week Date	Lecture Topic	Readings	Lab	Lab Deliverables
Week 1 January 08	<ul style="list-style-type: none"> • Course overview • What is GIScience? 	<ul style="list-style-type: none"> • Schuurman Ch. 1, "Introducing the Identities of GIS" 	Lab 1: Introduction to ArcGIS 10.x	
Week 2 January 15	<ul style="list-style-type: none"> • Principles of digital mapping 	<ul style="list-style-type: none"> • Bolstad Ch. 3, "Geodesy, Datums, Map Projections & Coordinate Systems", pp. 85-107 & 116-137 	Lab 2: Map Projections & Georeferencing	Lab 1 due
Week 3 January 22	<ul style="list-style-type: none"> • All about spatial data 	<ul style="list-style-type: none"> • Schuurman Ch. 3, "The Devil Is In The Data" 	Lab 3 – Part I: Data Collection & Data Entry	Lab 2 due
Week 4 January 29	<ul style="list-style-type: none"> • Data models • Vector data models 	<ul style="list-style-type: none"> • Bolstad Ch. 2, "Data Models", pp. 39-68 	Lab 3 – Part II	Lab 3 – Part I due
Week 5 February 05	<ul style="list-style-type: none"> • Data models cont'd • Raster data models 		Lab 4: Working with Vector Data	Lab 3 – Part II due
Week 6 February 12	MIDTERM EXAM		NO LAB	

Week Date	Lecture Topic	Readings	Lab	Lab Deliverables
February 19	READING BREAK			
Week 7 February 26	<ul style="list-style-type: none"> Vector analysis I 	<ul style="list-style-type: none"> Bolstad Ch. 9, "Basic Spatial Analysis", pp. 373-416 	Lab 5: Vector Analysis Using ArcGIS	Lab 4 due
Week 8 March 05	<ul style="list-style-type: none"> Vector analysis II 		NO LAB	
Week 9 March 12	<ul style="list-style-type: none"> Raster analysis I 	<ul style="list-style-type: none"> Bolstad Ch. 10, "Topics in Raster Analysis" 	Lab 6: Working with Raster Data	Lab 5 due
Week 10 March 19	<ul style="list-style-type: none"> Raster analysis II 	<ul style="list-style-type: none"> Bolstad Ch. 11, "Terrain Analysis" 	Lab 7: Terrain Analysis Using ArcGIS	Lab 6 due
Week 11 March 26	<ul style="list-style-type: none"> Modelling spatial phenomena 	<ul style="list-style-type: none"> Schuurman Ch. 4, "Bringing It All Together" 	Lab 8: Multi-Criteria Evaluation	Lab 7 due
Week 12 April 02	<ul style="list-style-type: none"> Ethics and spatial data praxis 	<ul style="list-style-type: none"> Schuurman Ch. 2, "GIS, Human Geography...", pp. 21-26 & 40-52 	Continue working on Lab 8	<u>Lab 8 due at end of lab section</u>
Week 13 April 09	<ul style="list-style-type: none"> Final exam review 			

7. Evaluation

Evaluation Components	Percentage of Course Grade	Assignment Schedule	Details
Laboratory assignments (8 assignments)	50%	See course schedule	Labs are due by the start of the (next) lab session . Save for late submissions that qualify for academic accommodations (see below), the penalty for late assignments is 20% for the first day, and 10% for every day thereafter (24 hour clock). No assignments will be accepted more than three working days (72 hours) past the original submission deadline (with the exception of those which qualify for academic accommodations).
Midterm exam	15%	Feb 12	In-class, 1 hr
Final exam	35%	Date TBA	Final Exam Period, 2hrs

Students are responsible for material covered in the lectures as well as the assigned chapters/sections in the text. **To pass the course**, students **must pass the laboratory component of the course** (achieve a minimum overall grade of 50% over the laboratory assignments in aggregate).

All laboratory assignments should be completed individually. While students are encouraged to problem-solve together, any assignments turned in for assessment must reflect each student's own, independently produced work. Two or more students submitting identical or near identical answers or map outputs for an assignment or parts thereof will each receive a grade of 0 on the assignment in question. Per University and Department of Geography regulations and procedures, any incidences of plagiarism will be reported to the Chair of the Department and to the Dean's office. This may be reflected on your transcripts.

8. Academic Accommodations

For Western's [Policy on Accommodation for Illness](#) and a downloadable SMC, please refer to the [Academic Handbook](#).

Students seeking academic accommodation on medical grounds for any missed tests, exams, participation components and/or assignments worth 10% or more of their final grade must apply to the Academic Counselling office of their home Faculty and provide documentation. Academic accommodation cannot be granted by the instructor or department.

Grades will not be adjusted on the basis of need. It is important to monitor your performance in the course. Remember: *You* are responsible for your grades in this course.

9. Make-up Examinations

Makeups will be granted with approved documentation only. All documentation for missed exams must be provided the Academic Counselling Office and Instructor within 48 hours of the scheduled exam. For missed exams, you must take your documentation to Academic Counselling within 48 hours of the exam. Otherwise, the instructor will assign a grade of zero. The format and content of make-ups may differ substantially from the scheduled test or examination.

10. Use of Electronic Devices

No electronic devices will be allowed during tests and examinations.

11. Lecture Slides & Recordings

No audio or video recording of lectures is permitted without the explicit written permission of the instructor. If you require an accessibility accommodation in this matter, please contact the instructor.

Lecture slides are the copyright of the instructor, and may not be disseminated, shared, or made available online through any course notes websites, or any other websites.

12. Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

13. Western's Commitment to Accessibility

The Department of Geography strives at all times to provide accessibility to all faculty, staff, students and visitors in a way that respects the dignity and independence of people with differential abilities.

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 519-661-2147 for any specific question regarding an accommodation. Information regarding accommodation of exams is available on the Registrar's website.

More information about "Accessibility at Western" is available.

14. Medical Issues

The University recognizes that a student's ability to meet his/her academic responsibilities may, on occasion, be impaired by medical illness. The Student Services website provides greater detail about the University's policy on medical accommodation. This site provides links the

necessary forms. In the event of illness, you should contact Academic Counselling as soon as possible. The Academic Counsellors will determine, in consultation with the student, whether or not accommodation should be requested. They will subsequently contact the instructors in the relevant courses about the accommodation. Once the instructor has made a decision about whether to grant an accommodation, the student should contact his/her instructors to determine a new due date for tests, assignments, and exams.

Students must see the [Academic Counsellor](#) and submit all required documentation in order to be approved for certain accommodation.

15. Mental Health

If you or someone you know is experiencing distress, there are several resources here at Western to assist you. Please visit Western's [Health and Wellness website](#) for more information on mental health resources.

16. Support Services

[Student Support Services](#)

[Student Development Services](#)

17. Important Dates

January 7: Classes resume

January 15: Last day to add a second term half or full course

February 18: Family Day – Department Office Closed

February 19-22: Spring Reading Week (No classes; Department Office open)

March 7: Last day to drop a second terms full or half course without penalty

April 9: Classes end

April 11-30: Final Examination Period

April 19: Good Friday

April 21: Easter Sunday

April 22: Easter Monday