Western SocialScience

Geography and Environment

GEOG 3222B – Geographic Information Science II
Course Outline: Winter 2022-23

1. Course Information

	Delivery Mode	Day/Time	Location
Lecture	In Person	**Monday, 10:30-12:30**	**SSC1004**
Lab	In Person	**Tuesday, 10:30-12:30**	**SSC1059**

Course Instructor	Contact Information	Office Hours (SSC2405)
Jed Long	jed.long@uwo.ca	TBA

Teaching Assistant(s)	Contact Information	Office Hours
TBD	TBD	TBA

2. Calendar Description

Methods and techniques in Geographic Information Science. Spatial data encoding from maps and geographic database implementation. Spatial interpolation and other modeling techniques. Integration of remote sensing, GIS, and Visualization. Hands-on experience using ESRI ArcGIS software.

Online lectures, 2 laboratory hours, 0.5 course

Antirequisite(s): N/A

Prerequisite(s): Geography 2210A/B or Biology 2244A/B or Statistical Sciences 2244A/B; and Geography 2220A/B. Adequate mathematical background is needed to be successful

Prerequisite checking is the student's responsibility

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

"Required" Textbook (available in the bookstore):

Peter A. Burrough, Rachael A. McDonnell, and Christopher D. Lloyd, 2015, Principles of Geographical Information Systems (3rd Ed.). Oxford University Press. (ISBN: 9780198742845)

Other Comparable GIS Textbooks

Longley, P.A., M.F.Goodchild, D.J.Maguire, and D.W.Rhind, 2016. Geographic Information Systems and Science (4th Ed.). John Wiley & Sons, Inc., 469 p. (978-1-119-03130-7 or ISBN : 978-1-118-67695-0).

Bolstad, Paul, 2016. GIS Fundamentals: A First Text on Geographic Information Systems (5th Ed.). XanEdu Publishing Inc., 770 p. (ISBN 1506695876 or 978-1506695877).

Chang, K.T., 2019. Introduction to Geographic Information Systems (9th Ed.). McGraw Hill, 448 p. (ISBN10: 1259929647 | ISBN13 9781259929649)

4. Course Objectives and Format

Course Objectives:

I. To gain new competencies for working with geographical data using GIS.
II. To become competent in vector and raster GIS analysis.
III. To improve cartographic and data visualization skills.
IV. To become confident in performing a variety of spatial analysis techniques.

Course Format:

Lectures: In person lectures, online videos, live tutorials, and readings

Labs: 2 hrs (In person delivery, demonstration and supported work time).

Expectations:

- Engagement with lecture and lab material is imperative to success in this course.
- The course material is cumulative.
- You should review lectures and readings weekly.
- It is the student's responsibility to cover any material missed by failure to attend lectures, please also see all material on the course website.
- Students must be organized, especially with computer files, please seek help if you are struggling with this component.

All course material will be posted to OWL: http://owl.uwo.ca. Any changes will be indicated on the OWL site and discussed with the class.

Google Chrome or Mozilla Firefox are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click here.

If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Evaluation

Evaluation Components	Percentage of Course Grade	Assignment Due Date
Lab Assignments (5 labs)	50%	See Course Schedule
Term Project	25%	April 7 2022
Final Exam	25%	TBD

☒ All assignments are due at 11:55 pm EST unless otherwise specified

☒ Written assignments will be submitted to Turnitin (statement in policies below)

☒ Students will have unlimited submissions to Turnitin

☒ After an assessment is returned, students should wait 24 hours to digest feedback before contacting their evaluator; to ensure a timely response, reach out within 7 days

Click here for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

Information about late or missed evaluations:

☒ Late assessments without illness self-reports will be subject to a late penalty 10%/day

☒ Late assessments with illness self-reports or self reported absences (see below) are subject to an automatic extension of 5-days unless otherwise discussed with the instructor.

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.

6. Learning Outcomes

Upon successful completion of this course, students will be able to:

- Deal with various forms of geospatial data
- Understand projections and coordinate systems
- Perform vector and raster GIS analyses
- Make high quality and informative maps
- Apply different spatial analysis techniques
- Present GIS projects on the web using StoryMaps and ArcGIS Online

7. Lab assignments

Lab #	Topic	Weight
Tutorial 1	Revisiting ArcGIS software	
Lab 1	Mini GIS Project	10%
Lab 2	Multi-Criteria Evaluation (MCE) with GIS	10%
Lab 3	3D Building Model Generation from LiDAR data	10%
Lab 4	ArcGIS Model Builder and Finding the Least-cost Path	10%
Lab 5	Network Analysis	10%

8. Course Schedule

Week #	Week Of (Monday)	Weekly Lecture Themes (Chapter in Burrough Text)	Lab	Lab due (Friday)
Week 1	Jan 09	Course Introduction (Ch 1) Geospatial Data (Ch 2, 3)	Tutorial 1	
Week 2	Jan 16	Coordinate Systems (Ch 2) Vector Spatial Analysis (Ch 7)	Lab 1	
Week 3	Jan 23	Raster Spatial Analysis (Ch 10) Scale in GIS (throughout)	Lab 1	Lab 1
Week 4	Jan 30	Digital Elevation Models (Ch 11) Introduction to Term Project	Lab 2	
Week 5	Feb 06	Spatial Interpolation (Ch 8, 9) Spatial Pattern Analysis (Ch 6)	Lab 2	Lab 2
Week 6	Feb 12	Introductory MCE History of Maps and GIS (Ch 5)	Lab 3	
Week 7	**Feb 20**	**Reading week (no lecture)**	**No Lab**	
Week 8	Feb 27	Cartographic Principles (Ch 5) Story Maps	Lab 3	Lab 3
Week 9	Mar 06	Cost Distance and LCP Network Analysis	Lab 4	
Week 10	Mar 13	GIS Work Flows GIS Programming	Lab 4	Lab 4
Week 11	Mar 20	GIScience Research @ Western	Lab 5	
Week 12	Mar 27	Term Project Help Session	Lab 5	Lab 5
Week 13	Apr 04	Exam Review Term Project Help Session	Project Help Session	

9. Course requirements

Attendance and participation: Students are expected to complete all lectures and labs. Additional material will be provided via OWL. Students are responsible for material covered in the lectures as well as the assigned chapters/sections in the text.

a) Participating at the lab is crucial to success in this course.
b) Assignments are due to be submitted online (via OWL) before 11:59 pm on the specified assignment due date. Plagiarism or copying is unacceptable and will be strictly enforced. Please follow the instructions for the GIS project. The penalty of a late assignment is 10% per day. Please write the course number, the instructor and TA name on your assignment.
c) The final exam will be administered online and will be comprehensive of all material in the course. It will involve a variety of question types and small analytical tasks. More information on the content, structure, and format of the final exam will be provided in the lecture material.
d) Students with special accommodation should get in contact with the instructor and the student services desk for Social Science. Please see Additional Statements below

10. Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The accommodation policy can be found here: Academic Accommodation for Students with Disabilities.

Academic Consideration for Student Absence

The University recognizes that a student's ability to meet their academic responsibilities may, on occasion, be impaired by medical illness. Illness may be acute (short term), or it may be chronic (long term), or chronic with acute episodes. The University further recognizes that medical situations are deeply personal and respects the need for privacy and confidentiality in these matters. However, in order to ensure fairness and consistency for all students, academic accommodation for work representing 10% or more of the student's overall grade in the course shall be granted only in those cases where there is documentation indicating that the student was seriously affected by illness and could not reasonably be expected to meet their academic responsibilities.

Policy on Academic Consideration for Medical Illness - Undergraduate Students

Student Medical Certificate (SMC)

Dr Long's Extension Policy:

Every student will be allowed to submit an assignment late one time. You will have up to 2 days to get your assignment in late. No need to email the instructor, the TA will identify this the first time you submit late. No questions will be asked. Any additional extensions or longer extensions will require formal academic consideration, otherwise late penalty will apply.

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar.

11. Use of Electronic Devices

Final exam will be of the take home variety.

12. How to Be Successful in this Class:

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.

1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule time at the start of each week to get organized and manage your time.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted to help you succeed in this class.
3. Take notes as you go through the lesson material. Keeping handwritten notes or even notes on a regular Word document will help you learn more effectively.
4. Connect with others. Try forming a study group and try meeting on a weekly basis for study and peer support.
5. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor(s) and or teaching assistant(s).
6. Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.

13. Continuity of Education Plan (in-person class pivoting to online learning)

In the event of a COVID-19 resurgence during the course that necessitates the university to direct courses move away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

14. 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.

15. 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 disabilities.

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.

16.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.

17. Support Services

Student Support Services
Student Development Services

18.Technical Requirements

Recommended technical specifications are available at:
https://registrar.uwo.ca/academics/timetables.html

19. Important Dates

See Western's Academic Calendar.