GEOG*3480 GIS and Spatial Analysis (0.5 CR)

Course Outline, Winter 2022

Department of Geography, Environment & Geomatics
College of Social and Applied Human Sciences
University of Guelph

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Prerequisite: 10.00 credits, including GEOG*2480

1. Overview
This course is one of two 3rd year courses (the other being GEOG*3420 Remote Sensing of the Environment) in the Geomatics stream of courses offered by Geography. The focus of this course is on the analysis of geographical data using GIS and related Geomatics technologies. GEOG*3480 provides the analytical background necessary for the thematic capstone course, GEOG*4480 Applied Geomatics.

2. Course Calendar Description
This course focuses on the use of raster and vector-based geographic information systems to analyze spatial data. Topics include spatial data query and overlay, data quality, spatial statistics, multi-criteria evaluation and digital terrain analysis. This course requires some familiarity with numerical methods and computer operations.

3. Learning Outcomes
By the end of the course, you should be able to:

- Understand the foundational theories of GIS including the unique character of spatial data.
- Analyze geospatial data using GIS software.
- Identify key issues related to spatial data error.
- Understand spatial analysis techniques and practices.
- Practice communicating concepts through formal written and visual forms.

4. Course Organization
Due to the ongoing COVID-19 pandemic in-person learning has been postponed until January 24th. This means that lectures will be conducted remotely via Zoom. Some lectures may be pre-
recorded and uploaded to Courselink before their scheduled times. I make regular announcements ahead of time on Courselink regarding which lectures will be synchronous and which will be asynchronous. You are expected to have been caught up on all lectures before the scheduled synchronous lecture sessions. Labs will be conducted remotely and synchronously via Microsoft Teams until January 24th.

5. Text and Other Resources
There is no required text for this class. The main recommended text is:


6. Method of Evaluation
Lecture material will be evaluated through a midterm and a final exam. Both the midterm and final exams will be scheduled, open-book, online exams, taken through the “quizzes” tool on Courselink. The lab material constitutes an integral part of this course, since this is where students receive hands on work with spatial datasets and must apply the techniques they have learned. Labs must be handed in to the teaching assistant at the beginning of the lab section in the week they are due, with a late penalty of 10% of the total assignment grade per day. Some of the concepts covered in labs may be included on both the mid-term and final exams.

7. Grade Distribution
- Lab Assignments: 40%
- Mid Term Exam: 30%
- Final Exam: 30%

8. Lecture Topics
Lectures will cover the following topics:

- Introduction to GIS and Spatial Analysis
- Spatial data quality
- Spatial data models and operations
- Spatial databases
- Multi-criteria evaluation
- Spatial statistics
- Spatial interpolation and Geostatistics
- Digital terrain analysis
- Future directions in GIS and Spatial Analysis

9. Laboratory Exercises
The labs are designed to familiarize you with basic GIS operations, and to teach you problem solving skills. By completing the labs, you will gain practical experience in using GIS software to create and edit datasets, manipulate and analyze data, and generate maps that communicate spatial information effectively.
The first lab session will take place during the week of January 18th. All lab activities and assignments will be carried out using ArcGIS Pro. All computers in the HUTT GIS lab have the necessary software installed on them. Students who wish to use their own computers to complete lab work are responsible for installing and maintaining their own GIS software installations.

Although no participation marks will be given, lab attendance is mandatory and attendance will be recorded by the GTA each week. The GTA is not obliged to respond to e-mail questions of students who fail to regularly attend lab sessions.

10. Laboratory Times
   - Section 0101: Thursdays, 7:00pm-9:50pm, HUTT-231
   - Section 0102: Wednesdays, 2:30pm-5:20pm, HUTT-231

11. Laboratory Fee
There is no laboratory fee for this course.

12. Software and Hardware Requirements
All software needed for the course has been installed on lab computers in HUTT-231 and -236. These computers will be available via Remote Desktop. Some questions on the midterm and final exam may require simple calculations, and a scientific calculator (available for around $20 at Staples or similar stores) is required.

13. Exam Format
There will be one mid-term and one final exam in this course. Both exams will be held online via the Courselink Quizzes tool. The exams are both online and open-book, but all students are required and expected to work on their own during exams. I will release more details on the exam format closer to the exam dates.

14. Exam Dates
The Midterm Exam is scheduled for **Friday, March 4th**. You will be given a window of time during which you may finish the exam on that day. More details will be given in the weeks leading up to the midterm date. The Final Exam is scheduled for **7:00pm-9:00pm on April 25th**.

15. Territorial Acknowledgements
We acknowledge that the University of Guelph resides on the ancestral lands of the Attawandaron people and more recently, the treaty lands and territory of the Mississaugas of the Credit. We recognize the significance of the Dish with One Spoon Covenant to this land and offer our respect to our Anishinaabe, Haudenosaunee and Métis neighbours as we strive to strengthen our relationships with them.

Today, this gathering place is home to many First Nations, Métis and Inuit peoples and acknowledging them reminds us of our important connection to this land where we learn and work.
16. Illness
Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g. final exam or major assignment).

17. COVID-19 Safety Protocols
For information on current safety protocols, follow these links:

- https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/
- https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.

18. Disclaimer
Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email. This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

19. E-mail Communication
As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

20. When You Cannot Meet a Course Requirement
Late assignments will be assessed a penalty of 10% per day (not including weekends). After the assignment has been handed back to the class no grade can be assigned on late work.

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

21. Drop Date
The last date to drop one-semester courses, without academic penalty, is Friday, April 8th. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar.

22. Copies of out-of-class assignments
Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.
23. Accessibility
The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services (SAS) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website.

24. Academic Misconduct
The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. An example of academic misconduct that might occur in this course is a student copying an answer or using a map/image from another student. Students must create their own digital files for computer-based exercises. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar.

25. Recording of Materials
Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

26. Resources
The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.