GEOG*3480 GIS and Spatial Analysis (0.5 CR)

Course Outline (Provisional), 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
Lectures and labs for the Winter 2022 semester are scheduled for face-to-face delivery. All lectures will be delivered in person and all students are expected to be on campus for lectures.
In addition to lectures, each student is registered for one in-person, two-hour lab session per week.

5. **Text and Other Resources**
The main *recommended* text for this class is:


6. **Method of Evaluation**
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%

The dates of the mid-term and final exams will be announced at a later date. The mid-term exam will be held during scheduled class time.

8. **Lecture Topics**
A detailed schedule of lecture topics will be published at the beginning of the course. 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

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.

All lab assignments will be carried out using ArcGIS Pro and Whitebox Tools. 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. GTAs are not obliged to respond to e-mail questions of students who fail to regularly attend lab sessions.

The lab schedule will be announced at the start of the course. Lab due dates are subject to change in the event of unforeseen scheduling conflicts. Changes to this schedule will be posted on CourseLink if required.

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. 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 closed-book and held in a face-to-face format. No aides will be allowed except for a scientific calculator.

14. Final Exam Date
    Exam dates will be announced at the beginning of the course. The final exam will not be cumulative.

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