

GEOGRAPHIC INFORMATION SYSTEMS PROJECT SPRING 2023

GEOG 481 / PLAN 481

Published May 08, 2023

CLASS SCHEDULE

Section	Location	Time	Instructor(s)
GEOG 481 001 [PRJ]	EV3 4412	Wednesdays 8:30 a.m. - 11:20 a.m.	Derek Robinson dtrobinson@uwaterloo.ca
PLAN 481 001 [PRJ]		Wednesdays 8:30 a.m. - 11:20 a.m.	
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INSTRUCTOR / TA INFORMATION

Instructor office hours: Tuesdays 2:00-3:00pm

COURSE DESCRIPTION

Calendar Description for GEOG 481

The development, implementation, and presentation of a response to a set of GIS related project requirements is the focus of this course. Students work in small teams to enhance and develop their abilities to work with GIS and related spatial technologies and analytical methods in an advanced project setting. The nature of the project requirements and themes varies with faculty and student strengths and interests. Projects may emphasize development of software applications, use of programming, or advanced GIS analysis methods, and draw from theme areas such as environment studies and management, human and physical geography, or planning.

Prereq: GEOG/PLAN 387, GEOG/PLAN 381 and ENVS 278

Calendar Description for PLAN 481

The development, implementation, and presentation of a response to a set of GIS related project requirements is the focus of this course. Students work in small teams to enhance and develop their abilities to work with GIS and related spatial technologies and analytical methods in an advanced project setting. The nature of the project requirements and themes varies with faculty and student strengths and interests. Projects may emphasize development of software applications, use of programming, or advanced GIS analysis methods, and draw from theme areas such as environment studies and management, human and physical geography, or planning.

Prereq: GEOG/PLAN 387, GEOG/PLAN 381 and ENVS 278

Building on the knowledge and skills acquired in GEOG/PLAN 281, 381, and 387, students develop and answer a research question that involves the use of geographic information systems (GIS). While the course is structured around a set of specific deliverables, listed in the section titled Schedule, it can broadly be divided into the following three parts: a proposal, project implementation, and a final paper.

The first part of the course focuses on creating and developing research questions and demonstrating how answering them is achievable within the timeframe of the course, in the format of a project proposal. **Students will co-develop projects with the assistance of the instructor. However, group/project teams will be assigned by the instructor after the class has started.**

As part of the proposal students will conduct a literature review to identify knowledge gaps, conceptual and implementation challenges, and situate their research question within the field of GIScience and the broader scientific literature.

The second part of the course involves implementing the proposed project and overcoming unanticipated challenges. This portion of the course typically involves investment and learning in new tools and techniques outside the standard GEOG/PLAN curriculum. During this time, project and time management skills will be tested. The instructor facilitates project management through meetings with individual groups that collaboratively define tasks for completion and assess the completion of previously defined tasks in a submitted weekly progress report.

The third part of the course focuses on understanding the structure of scientific publications and learning how to write a scientific paper. The project will be documented in the format of a scientific paper that uses the materials developed in the proposal, describes the data and methods used to answer the defined research question, presents results from the project, discusses the broader impacts of the type of research conducted, and identifies potential future directions. There will be a chance for preliminary feedback and subsequent revision of the final paper by individual groups, but this is dependent on a draft of the final paper completed early by students.

Students will learn how to define a research problem, implement a solution, and communicate the process and results in a paper format.

NOTE: The course carries a weight of 1.0 and is equivalent to two standard undergraduate courses. Effectively this means that you should expect to complete the same amount of work as was done in GEOG/PLAN 381 and 387 combined. Therefore, significant additional time will be required for independent and group work outside scheduled lecture hours. You can expect to devote **at least 10 to 12 hours each week** to learning new skills and applying them to your project and deliverables. If you cannot make this level of time commitment, you should consider other courses.

LEARNING OUTCOMES

By the end of this course students should be able to:

Conceptualize a spatial analysis/GIS research project from start to finish.
Communicate complicated spatial analysis and GIS methods effectively using oral and written media.
Understand how to develop a project proposal.
Work in a team environment that combines both independent work and dependencies with other team members.
Synthesize and expand upon previous geomatics skills.

TENTATIVE COURSE SCHEDULE

Week	Date	Topic	Deliverables
1	May 10	Introduction to the course, deliverables, expectations; potential project topics; formulating a research question	
	May 12		Biosketch
2	May 17	Writing a research proposal and literature review (online live)	Project ranking/group assignment
3	May 24	How to report results and spatial patterns (online recorded)	
4	May 31	Proposal presentations	Proposal presentation
5	June 7	Proposal evaluations	Proposal draft and evaluation
	June 9		Proposal due
6	June 14	Group meetings with instructor	Weekly progress report
7	June 21	Group meetings with instructor	Weekly progress report
8	June 28	Independent Group Work	
9	July 5	Group meetings with instructor	Weekly progress report
10	July 12	Group meetings with instructor	Weekly progress report
11	July 19	Final Presentations	
12	July 26	Final Paper Due	

TEXTS / MATERIALS

There is no required textbook for this course. Course slides will be provided as electronic documents on Waterloo LEARN. The following books cover spatial analyses that may be used in the course, are suitable for further reading:

Title / Name	Notes / Comments	Required
De Smith, M.J., M.F. Goodchild & P.A. Longley (2007). Geospatial analysis: a comprehensive guide to principles, techniques and software tools. Matador. Available electronically at http://www.spatialanalysisonline.com		No
Lloyd, C.D., (2010). Spatial data analysis: an introduction for GIS users. Oxford University Press.		No
Lutz, M. (2009). Learning Python. 4th edition, O'Reilly.		No
O'Sullivan, D. & D.J. Unwin (2010). Geographic information analysis. Wiley.		No
Wilson, J.P. & J.C. Gallant (2000). Terrain analysis: principles and applications. Wiley.		No

STUDENT ASSESSMENT

Component	Value
Deliverable 1: Biosketch	5%
Deliverable 2: Proposal presentation	5%
Deliverable 3: Proposal draft and peer proposal evaluation	5%
Deliverable 4: Proposal	25%
Deliverable 5: Final paper presentation	20%
Deliverable 6: Final paper	30%
Deliverable 7: Peer evaluation	10%

Deliverables 1 and 7 will be submitted individually. All other deliverables are prepared and submitted in groups of 3 or 4. Groups of 5 are unacceptable. Deliverables must be newly developed for GEOG/PLAN 481 and differentiated from past and current coursework. Any duplication of text verbatim and in some cases duplication of methods will result in those items being handed to Faculty with administrative duties to deal with academic offences. Deliverables must be submitted to the appropriate drop box on the course website by the due date and time posted on LEARN. **Late deliverables will not be accepted and will receive a mark of zero.** Exceptions may be made for extreme documented medical reasons.

Group meetings will involve setting a list of requirements for completion over the coming week and then addressing the outcomes of those requirements the following week in a progress report. Where individuals have not made weekly progress or submitted a progress report there is a penalty of 2% applied to your final grade for each scheduled group meeting that does not show significant progress.

Given the unforeseen events related to COVID-19 and other public health issues, the deliverables may be altered and updated as the term progresses. Changes to the schedule will be notified to the class via the LEARN Announcements and via MS Teams as well as with an updated Syllabus posted on LEARN.

ASSIGNMENT SCREENING

Text matching software (Turnitin) will be used to screen assignments in this course. This is being done to verify that use of all material and sources in assignments is documented. In the first week of the term, details will be provided about the arrangements for the use of Turnitin and alternatives in this course. See Administrative Policy below for more information and links.

ADMINISTRATIVE POLICY

Community of Learners

A goal for this course is that we shall all contribute to a climate that promotes a Community of Learners. This includes participating in an instructional environment that promotes respect, interaction, and communication. Respectful language and behaviour are expected of all students during classes and class discussions.

Please Note: In a community of learners, diversity of opinion is respected. Class discussions, group exercises, etc., should reflect respect for others' opinions. If you anticipate an emergency during the class meeting that will require the activation of your cell phone and/or device please speak with the instructor before class. Otherwise, please respect the instructional environment that is interrupted if cell phones or devices are activated.

Intellectual Property

For further information on IP related to teaching, please see https://uwaterloo.ca/legal-and-immigration-services/sites/ca.legal-and-immigration-services/files/uploads/files/volume_1_issue_3_winter_2018.pdf (https://uwaterloo.ca/legal-and-immigration-services/sites/ca.legal-and-immigration-services/files/uploads/files/volume_1_issue_3_winter_2018.pdf) and the Guidelines for Faculty, Staff and Students Entering Relationships with External Organizations Offering Access to Course Materials, <https://uwaterloo.ca/secretariat/faculty-staff-and-students-entering-relationships-external> (<https://uwaterloo.ca/secretariat/faculty-staff-and-students-entering-relationships-external>). The following text is recommended:

Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with

permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, **sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights.** For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

Mental Health: The University of Waterloo, the Faculty of Environment and our Departments/Schools consider students' well-being to be extremely important. We recognize that throughout the term students may face health challenges - physical and / or emotional. **Please note that help is available.** Mental health is a serious issue for everyone and can affect your ability to do your best work. Counselling Services <https://uwaterloo.ca/campus-wellness/> (<https://uwaterloo.ca/campus-wellness/>) is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.

All students are encouraged to download the WatSAFE app which is available free through the google and iOS app stores. The WatSAFE app provides on- and off-campus contacts for students in distress, including international students, and other information related to campus safety and security.

Religious Observances: Students need to inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

Communications with Instructor and Teaching Assistants: All communication with students must be through either the student's University of Waterloo email account or via LEARN. If a student emails the instructor or TA from a personal account they will be requested to resend the email using their personal University of Waterloo email account.

Recording lecture: Use of recording devices during lectures is only allowed with explicit permission of the instructor of the course. If allowed, video recordings may only include images of the instructor and not fellow classmates. Posting of videos or links to the video to any website, including but not limited to social media sites such as: facebook, twitter, etc., is strictly prohibited.

UNIVERSITY POLICY

Academic integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check [the Office of Academic Integrity](https://uwaterloo.ca/academic-integrity/) (<https://uwaterloo.ca/academic-integrity/>) for more information.]

Grievance: A student who believes that a decision affecting some aspect of their university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](#)

(<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70>) . When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for their actions. [Check [the Office of Academic Integrity](https://uwaterloo.ca/academic-integrity/) (<https://uwaterloo.ca/academic-integrity/>) for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71) (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71>) . For typical penalties, check [Guidelines for the Assessment of Penalties](https://uwaterloo.ca/secretariat/guidelines/guidelines-assessment-penalties) (<https://uwaterloo.ca/secretariat/guidelines/guidelines-assessment-penalties>) .

Appeals: A decision made or penalty imposed under [Policy 70, Student Petitions and Grievances](https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70) (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70>) (other than a petition) or [Policy 71, Student Discipline](https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71) (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71>) may be appealed if there is a ground. A student who believes they have a ground for an appeal should refer to [Policy 72, Student Appeals](https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72) (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72>) .

Note for students with disabilities: [AccessAbility Services](https://uwaterloo.ca/disability-services/) (<https://uwaterloo.ca/disability-services/>) , located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

Turnitin.com: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit alternate assignment.