**RENR 201 / GEOG 250**

**Introduction to Geomatic Techniques / Introduction to Mapping and GIS**

**Term: Winter 2023**

# Course Outline

**INSTRUCTOR:** Samantha Kerr, PhD
**EMAIL:** skerr1@yukonu.ca
**MEETING TIMES:** Lecture – Monday 6:00 - 8:50 pm, Lab – Wednesday 6:00 - 8:50 pm
**MEETING LOCATION:** Lecture – Zoom, Lab – T1030A
**OFFICE HOURS:** please email to schedule a time

**LAB INSTRUCTOR:** Emilie Stewart-Jones
**EMAIL:** estewartjones@yukonu.ca

## COURSE DESCRIPTION

In Winter 2023, GEOG 250, *Introduction to Mapping and GIS*, is being offered at Yukon University concurrent with the University of Alberta's RENR 201, *Introduction to Geomatic Techniques*, as part of the Northern Environmental and Conservation Sciences, B.Sc. Program. All students registered in GEOG 250 or RENR 201 must adhere to requirements outlined in this course syllabus. University of Alberta students must also be aware of, and adhere to, the University's Code of Student Behaviour, referenced in the outline; Yukon University students must be aware of, and adhere to, Yukon University's Academic Regulations, also referenced in the outline.

This course is an introduction to mapping and geographical information systems (GIS), a tool for automating geographic concepts. Students will acquire a foundation about coordinate systems and map projections, use maps in paper and digital formats, and learn how to properly read and use them. Students will learn the principles of data collection and data management, and how to use datasets to create maps customized for various purposes. In this hands-on class, we will primarily use ArcGIS Pro. Weekly lab assignments will provide concrete examples. At the end of term, students will be able to collect and download datasets, organize them into a simple database and create thematic maps.

**COURSE REQUIREMENTS**

**For all students:**
- o Computer skills and working knowledge of the Windows operating environment
- o Basic understanding of geographical concepts (i.e., directions and location on a map)
- o Basic understanding of simple statistics (average, mean, and standard deviation)

**For students taking the course as RENR 201:**
- o Registration in Yukon University/University of Alberta B.Sc. in Environmental and Conservation Sciences degree program

**EQUIVALENCY OR TRANSFERABILITY**

Receiving institutions determine course transferability. Find further information at: https://www.yukonu.ca/admissions/transfer-credit. Students in the B.Sc. ENCS program should contact an ENCS advisor if they have questions about equivalency or transferability of this course.

| For example, GEOG 250 transfers as: | SFU GEOG 3XX (3) | UBC GEOG 200 level (3) |
|---|---|---|
| | UNBC GEOG 300 (3) | UVIC GEOG 200 level (3) |
| | TRU GEOG 275 (3) | TWU GEOG 390 (3) |

**LEARNING OUTCOMES**

Upon successful completion of this course students will be able to do the following:
- o Explain essential cartographic principles
- o Be able to use paper and digital maps to plot coordinates, measure distances, areas, etc.
- o Differentiate the many uses of maps and choose the appropriate type of map (topographic and thematic) for various uses and purposes
- o Explain the basic methods of spatial data acquisition including GPS and satellite images
- o Use spatial data to create maps adapted to various audiences and purposes
- o Be proficient in collecting, exploring, managing, and analysing both spatial and tabular data in ArcGIS Pro

**COURSE FORMAT**

**1) Weekly Instruction**

The course lecture and lab are delivered in a 3-hour format each week. Attendance and participation at all activities is highly recommended and necessary for student success. Participation in classes will be evaluated through in class activities and via questions and

quizzes available on the course website. I will be available through office hours for additional support, and students are encouraged to contact me via email to set up a time if they need assistance with course content or lab related material.

## 2) Delivery Format

This class will be divided into weekly lectures and weekly labs. All class time will be delivered remotely. Participatory activities will be offered during the lectures to make it as interactive as possible. Exercises on lecture content will be available on the course website to offer additional ways of learning. The labs are extremely hands-on, they will allow the students to fully understand the use of the theory taught in the lectures and put it into application.

Lecture material will be provided to the students on a weekly basis on the course website. There will be individual and group assignments throughout the term. Group assignments are collaborative work where students work together and must be submitted as such. Lab material will be evaluated with weekly assignments. Additionally, a portion of the lab marks will be based on a mandatory term project.

Due dates for all assignments will be clearly indicated on each assignment. Late assignments will have a penalty of 10% for the week and a mark of zero will be attributed after that. Extension may be granted exceptionally and under special circumstances. Please communicate with your instructor prior to the assignment due date. Once the due date has passed no exception will be granted.

There will be a midterm exam and a final written exam primarily evaluating lecture material, however, knowledge acquired in the laboratory material may be useful to provide examples during these exams. Students who miss an exam will receive a zero mark for this exam. If under special circumstances (need a valid reason) a student cannot attend the exam, they must communicate with their instructor and make arrangement at least a week prior to the exam date. During exams, only calculators are permitted. No cell phone or laptop.

## 3) Assignment of Grades

The total numerical score will be converted to a grade on Yukon University's letter grading system.

**COURSE EVALUATION**

| Deliverable | Weight |
|---|---|
| Class Participation | 10% |
| Midterm Examination | 15% |
| Weekly Lab Assignments | 25% |
| Technical Quiz | 10% |
| Term Project | 20% |
| Final Examination | 20% |
| Total | 100% |

**TEXTBOOKS and LEARNING MATERIALS**

Campbell J., Shin M,. (2011) Essential of Geographic Information Systems.

This is an open source e-book available at https://open.umn.edu/opentextbooks/textbooks/essentials-of-geographic-information-systems

Participants will require the following: 16GB USB stick, pencils, eraser, 30 cm ruler, protractor, and calculator with basic trigonometric functions (sine, cos, tan).

**COURSE WEBSITE**

Course material will be posted on two separate Moodle pages, one for the lecture and one for the labs. The gradebook in the lecture website will comprehensive and include the labs grade as well. Students can use Yukon University's knowledge base to learn how to use Moodle: https://www.yukonu.ca/knowledgebase

**COURSE WITHDRAWAL INFORMATION**

The last day to withdraw without academic penalty Feb. 7, 2023. Last day to apply to graduate Feb. 15, 2023. Refer to the Yukon University website for other important dates: https://www.yukonu.ca/admissions/important-dates

**ACADEMIC INTEGRITY**

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all

forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document. Please refer to Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

## ACCESSIBILITY AND ACADEMIC ACCOMMODATION

Yukon University is committed to providing a positive, supportive, and barrier-free academic environment for all its students.  Students experiencing barriers to full participation due to a visible or hidden disability (including hearing, vision, mobility, learning disability, mental health, chronic or temporary medical condition), should contact Accessibility Services (https://www.yukonu.ca/student-life/learning-matters/accessibility-services) for resources or to arrange academic accommodations: access@yukonu.ca.

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Please refer to Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.


**University of Alberta Academic Integrity and Code of Student Behaviour**

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students at the University of Alberta are subject to the Code of Student Behaviour, as outlined at:
http://www.governance.ualberta.ca/en/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour.aspx  Please familiarize yourself with it and ensure that you do not participate in any inappropriate behavior as defined by the Code. Key components of the code

include the following statements.

30.3.2(1) No Student shall submit the words, ideas, images or data of another person as the Student's own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study.

30.3.2(2) c. No Student shall represent another's substantial editorial or compositional assistance on an assignment as the Student's own work.

**PROFESSIONALISM AND CLASSROOM RULES OF ENGAGEMENT**

Students are expected to attend all lectures and labs, be engaged and courteous in all course activities, and to be on time for class.

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Please note that some classes may be recorded using web conferencing software, and links to recordings may be posted on the class website.

www.yukonu.ca

## TENTATIVE TOPIC OUTLINE

| Week | Lecture | Lab |
|---|---|---|
| 1 | Introduction, Mapping & GIS | |
| 2 | Map scale, Distance, Coordinate Systems | Map Reading |
| 3 | Projections & Map Distortions | Introduction to ArcGIS Pro |
| 4 | Geospatial Relationships | Map projections, UTM & Geographic Coordinate Systems |
| 5 | Types of data & Cartography | Selecting Features in ArcGIS Pro |
| 6 | Data Management | Purpose of your Map |
| 7 | Data Management | Creating a GIS Database |
| | **Reading Week: February 20-24 [NO CLASS]** | |
| 8 | **Midterm Examination** | Creating GIS Datasets |
| 9 | GPS & Maps | Term Projects |
| 10 | Map Quality & Uncertainty | Data Collection |
| 11 | Introduction to Spatial Analyses | Term Projects |
| 12 | Area Measurements | Performing Basic GIS Analyses |
| 13 | Review | Review |
| 14 | **Final Exam** [April 20, 1:00 – 4:00] | Lab Quiz |