**SCHOOL OF SCIENCE**
**Maps and Remote Sensing**
**3 Credit Course**
**Winter, 2014**

# MAPS AND REMOTE SENSING

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**INSTRUCTOR:** Samantha Darling **OFFICE HOURS:** by appointment

**E-MAIL:** sdarling@yukoncollege.yk.ca

**TIME:** Lectures: Tuesday and Thursday 4:00pm – 5:30pm (A2402)
Labs: Wednesday 9:00am-12pm (A2702)

**TELEPHONE:** 668-8288

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## COURSE DESCRIPTION

This course is an introduction to the use and interpretation of maps, air photos and other remotely sensed imagery. Students will learn to collect geographic data using a GPS and to create digital maps. Participants will examine techniques for collecting, displaying and interpreting spatially arranged data commonly used in renewable resources management and will perform tasks such as route finding and navigation.

## PREREQUISITES

Registered in the Renewable Resources Management Program or with permission of instructor.

## LEARNING OUTCOMES

On successful completion of this course students will:

- Be able to use paper maps and digital maps to plot coordinates, measure distances, areas, slopes, etc.
- Use appropriate topographic and thematic maps for tasks in renewable resources management
- Use a GPS (the e-trex Legend) to capture waypoints and tracks, to navigate, and to create maps using downloaded GPS data
- Know how to access various kinds of geographic information available on the Internet
- Access interactive maps on the Internet in order to assess land dispositions, etc.
- Know what kinds of remotely sensed data are available and their principle uses in renewable resources management
- Know how to locate and use stereoscopic aerial photography to map land features

## DELIVERY METHODS

Though the class is divided into lecture and lab components, there will be hands-on practical activities during some 'lecture' periods and there will be some lecturing during 'lab' periods. Some lab activities may involve fieldwork or visits to work places. The course will focus on the acquisition of practical skills and on developing a fundamental understanding of the role of mapping and remote sensing in resource management. Sufficient theory will be included to provide an understanding of techniques.

## ASSESSMENTS

### Attendance

Attendance AND participation at all activities is mandatory.

### Assignments

There will be ten assignments based on the readings and lectures, typically these will be started in the lectures and you will have to complete them out of class time. Answers will be available on MyYC for assignments, after they have been marked. **Assignments will be handed in for evaluation, and are due at 4:00 p.m. on Thursday afternoons (before class starts)**. Assignments can be submitted by e-mail to sdarling@yukoncollege.yk.ca. Late assignments and labs will not be marked.

Lab material will be evaluated primarily with weekly assignments. Additionally, a portion of the lab marks will be based on a mandatory term project. Students are expected to spend **at least 3 hrs/wk** on lab assignments. The large class size this year will require that most labs have only 1.5 hours of class time. Students will need to complete lab assignments on their own time using library reserve material and scheduled computer lab time.

There will be weekly 'quick-quizzes' (5-10 minutes long) at 4:00 p.m., sharp, each Tuesday. Quizzes will test material that has been 'covered' in previous classes and labs. These quizzes are intended to confirm mastery of fundamental concepts, and to reward attendance and punctuality. The best ten test marks will be used. Students who arrive late will get a mark of zero.

All students will complete a term project by drawing on both laboratory and lecture material. There will be a midterm exam and a final written exam primarily evaluating lecture material, however, some lab material may be assessed during these exams. Students must achieve a weighted average of 50% or better to pass the course. However, given that this is, fundamentally a "skills" base course, students should strive for mastery of the skills. Mastery would imply an average of better than 70%.

## EVALUATION

| | |
|---|---|
| **Lecture** | **60** |
| Quick-quizzes | 10 |
| Attendance/participation | 5 |
| Assignments | 10 |
| Midterm exam | 15 |
| Final written exam | 20 |
| | |
| **Lab** | **40** |
| Lab exercises | 15 |
| Term project | 25 |
| **Total** | **100** |

## REQUIRED TEXTBOOKS OR MATERIALS

There will be no assigned text. Instead, students will be required to use the MyYC to access assigned readings.

Participants will require the following: pencils, HB and H, eraser, 30 cm ruler and calculator with basic trigonometric functions (sine, cos, tan).

## PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

## ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukoncollege.yk.ca.

**TOPIC OUTLINE**

**NOTE**: This syllabus is subject to change

| Week | Lecture | Lab | Assignment |
|---|---|---|---|
| **1** | Introduction, math pre-test, the earth and earth coordinates | Introduction to maps | - |
| **2** | Map scale and distance finding, map projections | Using maps (1): Map projections, UTM and Geographic coordinate systems | #1 assigned |
| **3** | Grid coordinate systems (Universal Transverse Mercator – UTM system and Universal Polar Stereographic system) | Using maps (2): Measuring distances, converting between MGRS and UTM | #1 due<br>#2 assigned |
| **4** | Relief portrayal (topography) | Using maps (3) | # 2 due<br>#3 assigned |
| **5** | Quantitative and qualitative thematic maps | Introduction to air photos and remotely sensed data | # 3 due<br>#4 assigned |
| **6** | Map accuracy and uncertainty | Term Projects: Researching your project area **– Lab held at the Elijah Smith Building** | # 4 due<br>#5 assigned |
| **7** | Direction finding and compasses | Term Projects: Preliminary mapping | # 5 due<br>#6 assigned |
| **8** | Review, **mid-term** | NO LAB – STUDY! | # 6 due |
| **9** | Global Positioning System (GPS) and maps | Term Projects: Data Collection – **This lab is OUTSIDE, please dress appropriately!!!** | #7 assigned |
| **10** | Position finding and navigation | Term Projects: Digital Maps (1) | # 7 due<br>#8 assigned |
| **11** | Area and Volume Measurements | Term Projects: Digital Maps (2) | #8 due<br>#9 assigned |
| **12** | **READING WEEK: NO CLASS** | | |
| **13** | To be determined | Work on Term Projects | #9 due<br>#10 assigned |
| **14** | Projects and/or review | **Term Projects Due** | #10 due |
| **15** | **Final Exam** | NO LAB this week | |