

**GEOG 105E - Introduction to Mapping, GPS, Remote Sensing and GIS**

*3 credits, 3 hours lecture, 3 hours lab*

The course will train students in the use and application of paper, digital, and computer methods for acquisition, presentation and interpretation of geospatial data. Topics will include topographic and reference maps, scales and coordinate systems, land survey systems, global positioning systems (GPS), thematic maps, remote sensing air photo interpretation, and the utilization of geographical information systems (GIS) with ArcView. Emphasis will be placed on practical applications, but some understanding of basic principles is also essential. Lab work will cover a broad spectrum of interest areas, but also linked where possible to environmental applications.

**Instructor**

Paul Knaga

Office location: Room S213E

Phone number: 780-791-4824

**Office Hours**

Friday - By appointment

**Hours of Instruction**

Tuesday- 06:30 - 09:30 p.m., Room S105

Wednesday - 06:30 - 09:30 p.m., Room S105

**Required Resources****Getting to Know ArcGIS**

M. Law and A. Collins; 4<sup>th</sup> Edition

**Course Outcomes**

The student will be able to:

- Identify and effectively use GIS technologies with emphasis on ESRI's ArcGIS Desktop.
- Explain topographic maps, map scales, symbols, and projection systems.
- Explain GPS and GIS data, and demonstrate this understanding in data analyses and in mapping.
- Describe and work with thematic maps and cartographic principles.
- Work directly with remotely sensed images, and create useable data.
- Discuss the basic principles of remote sensing.
- Explain GIS components and their functionality,
- Describe GIS and illustrate applications at work, as well as in everyday life.

**Evaluation**

Please note: It is a requirement that all assignments and tests must be submitted as a condition to passing this course.

<b>Evaluation Method</b>	<b>Percentage</b>	<b>Due Date</b>
Lab Assignments	45% (5% each)	One Week from Lab Date
Learning Activities	10%	Before Lecture
Midterm Exam	15%	Week 7
Final Exam	30%	TBD
Total	100%	

*A grade of C- is required for progression or transfer.*

**Grading System**

<b>Descriptor</b>	<b>Alpha Grade</b>	<b>4.0 Scale</b>	<b>Percent</b>	<b>Rubric for Letter Grades</b>
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory <b>Progression</b>	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor <b>Minimum Pass</b>	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

## Proposed Schedule of Topics

Week	Main Topic	Learning Activities	References
1 Jan 9/10	<b>Lecture:</b> Introduction to GIS and Geomatics, Nature of Information, ArcGIS <b>Lab:</b> No Lab	3a: Displaying Map Data 3b: Navigating a Map 3c: Using Basic Tools 3d: Looking at Feature Attributes	Chp 1: Introducing GIS Chp 2: Introducing ArcGIS Chp 3: Interacting With Maps
2 Jan 16/17	<b>Lecture:</b> Introduction to GIS, Managing Data, <b>Lab:</b> Introduction to ESRI ArcMap	4a: Browsing Through Map Data 4b: Adding Data To A Map 4c: Working With Map Layers 5a: Creating a Web Map 5b: Merging Online and Local Layer 5c: Sharing a Map Package	Chp 4: Interacting with Data Chp 5: Exploring Online Resources
3 Jan 23/24	<b>Lecture:</b> Georeferencing, Ellipsoids and Reference Systems <b>Lab:</b> Projections, Coordinates Systems	6a: Examining Coordinate Systems 6b: Projecting Data 6c: Defining a Map Projection 6d: Georeferencing a Raster	Chp 6: Working with Coordinate Systems and Projections
4 Jan 30/31	<b>Lecture:</b> Cartography as Related to GIS <b>Lab:</b> Map Production	7a: Creating Custom Symbology 7b: Symbolizing Features by Categorical Attributes 7c: Using Styles and Creating Layer Files 7d: Symbolizing Rasters 8a: Classifying Features by Standard Methods 8b: Mapping Density 8c: Using Graduate and Chart Symbols 9a: Using Dynamic Labels 9b: Setting Rules for Label Placement 9c: Creating Graphic Labels 9d: Converting Dynamic Labels to Annotation 10a: Creating a Layout 10b: Adding Titles and Text 10c: Adding Standard Map Elements 10d: Adding Final Touches	Chp 7: Symbolizing Features Chp 8: Classifying Features Chp 9: Labeling Features Chp 10: Making Maps for Presentation
5 Feb 6/7	<b>Lecture:</b> GIS Data Capture and Collection <b>Lab:</b> Digitizing	11a: Creating a Geodatabase 11b: Creating Feature Classes 12a: Drawing Features 12b: Using More Construction Tools 13a: Deleting and Modifying Features 13b: Splitting and Merging Features 13c: Editing Feature Attribute Values	Chp 11: Building Geodatabases Chp 12: Creating Features Chp 13: Editing Features
6 Feb 13/14	Mid-Term Exam		
7 Feb 20/21	Reading Week		
8 Feb 27/28	<b>Lecture:</b> Metadata and Documentation <b>Lab:</b> Documentation	Guest Lecture	TBA
9 Mar 6/7	<b>Lecture:</b> GIS Databases and Querying <b>Lab:</b> Queries and Tables	15a: Selecting and Finding Features 15b: Using Attribute Queries 15c: Creating Reports 16a: Using Location Queries 16b: Combining Attribute and Location Queries 17a: Joining Data by Attribute 17b: Relating Data 17c: Joining Data by Location	Chp 15: Querying Data Chp 16: Selecting Features by Location Chp 17: Joining and Relating Data

10 Mar 13/14	<b>Lecture:</b> Geoprocessing <b>Lab:</b> Clipping, Buffering, and Overlays	18a: Dissolving Features 18b: Clipping Layers 18c: Creating a Data Subset 18c: Running Tools in a Model 19a: Buffering Features 19b: Overlaying Data 19c: Calculating Attribute Values 19d: Creating Graphs	Chp 18: Preparing Data for Analysis Chp 19: Geoprocessing Vector Data
11 Mar 20/21	<b>Lecture:</b> Global Positioning Systems <b>Lab:</b> Using GIS and GPS Together	TBD	TBD
12 Mar 27/28	<b>Lecture:</b> Raster GIS <b>Lab:</b> Building and Analyzing Rasters	20a: Creating Raster Surfaces 20a: Combining Raster Surfaces	Chp 20: Using Spatial Analyst
13 Apr 3/4	<b>Lecture:</b> Remote Sensing	TBD	TBD
14 Apr 10/11	<b>Lecture:</b> Drones	Guest Lecture	TBD
15 Apr 17/18	No Classes		
16 Apr 24/15	Final Exam (Date TBA)		

**Please Note:**

Date and time allotted to each topic is subject to change. It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College Credit Calendar.

**Performance Requirements****Student Attendance**

Class attendance is useful for two reasons. First, class attendance maximizes a students' learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

**Academic Misconduct**

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person

- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of Conduct section of the Keyano College 2015-2016 credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on [ilearn.keyano.ca](http://ilearn.keyano.ca). Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate.

## **Specialized Supports**

### **Counselling and Disability Services**

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

### **SKILL Centre**

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

**Authorization**

This course outline has been reviewed and approved by the Program Chair.

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Paul Knaga, Instructor

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Louis Dingley, Chair

Date Authorized

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Vincella Thompson, Dean

Date Authorized

**Signed copies to be delivered to:**

Instructor

Registrar's Office