

DEPARTMENT OF GEOGRAPHY - UNIVERSITY OF VICTORIA  
COURSE HANDOUT - GEOGRAPHY 329  
**GIS APPLICATIONS AND TOOLS**  
Spring 2016

*The University of Victoria is committed to promoting, providing and protecting a positive and safe learning and working environment for all its members*

<b>Instructor</b>	Ian J. O'Connell (ianoc@uvic.ca), (SSM B322, Local 7338) (N48°27'52" W123°18'52")	
<b>Class time</b>	Tuesday	10:30 – 11:20 COR B107
	Wednesday	10:30 – 11:20 COR B107
<b>Office Hours</b>	See CourseSpaces or by appointment	

### **Course Objective**

The key objective of this course is to introduce the theory, concepts and applications of Geographic Information Sciences. Lectures introduce the concepts, including geographic information databases; analytical GIS functionality such as spatial query, topological overlay, spatial tessellation; custom spatial information end-product generation; and issues that are related to implementation and application of Online GIS. Labs will provide you with hands on experience in ArcGIS 10, Google Products, and online mapping.

This course employs Problem Based Learning as a key foundation to learning. To that end the labs build upon the step-by-step approach taken in your lower level GIS/RS courses. The assignments are based upon a problem that needs to be solved rather than multiple questions. You are introduced to the skills and resources necessary to solve the problem. These resources include videos, websites, readings, online help, and examples. You are then expected to write up how you solved it and to present your solution and the rationales of the approaches you took to do so. I recommend you bring both headphones (for the video resources) and a USB drive (for your data collection and backup)

**Learning Outcomes** ability to employ GIS to solve wide ranging problems;  
ability to use selected components of advanced GIS modeling applications  
ability to customize online mapping products (Google Earth, ArcGIS Online)  
ability to use model builder, geoprocessing tools, and scripts  
skills and experience of a leading GIS platform (ArcGIS 10.2)  
integration of diverse datasets and data models  
development of presentation and report writing skills

**Class Meetings** Class will meet on a regular basis twice a week (see schedule attached). Attendance in class is expected in order for you to understand and complete lab assignments, and to pass examinations. *No Audio or Video recordings are allowed.*

**Labs** This course includes 5 graded lab reports, and a lab presentation (see schedule attached). **You will have space on our servers to complete assignments – only materials relating to 323 can be stored – no personal or private**

**material allowed.**

**Examinations** There will be a mid term and a final examination.

### **Important Dates and Course Evaluations**

<b>Component</b>		<b>Value</b>	<b>Dates</b>
<b>A</b>	Lab assignments	45	5 Reports – see below
<b>B</b>	Mid term	15	Tuesday 16 <sup>th</sup> February
	Final	40	Exam Period (April)

### **Late Assignments**

Lab assignments are due during your scheduled lab time. Deadline for submission of lab assignments will be given to you during labs. Students submitting labs late will be penalized. The initial late penalty is **25%**. For every day after that, you will lose **25%** per day. An 'N' grade is given when a student has missed one or more components of a course and does not reach a passing grade. Failure to complete assignments (**Labs**), exams (**midterm, or final**) without permission from the instructor will result in an 'N' grade, which equals a Grade Point Value of 0). Exceptions will only be granted for medical reasons (requiring a written report from a medical practitioner as soon as possible stating your inability to attend class). The written report must be submitted as soon as possible. The course instructor can only grant exceptions.

### **Readings and Course Help**

Readings will be assigned in class. Some references will be websites.

### **LECTURE HANDOUTS**

Topic handouts based on lecture presentations will be provided. They will be posted on CourseSpaces the evening before the next lecture. Topic handouts will be removed 7 days after the posting date. Students are responsible for downloading/saving and completing notes packages. If you miss any material please make arrangements to get handouts from a fellow student, not the instructor.

**Electronic devices for use during exams are limited to scientific calculators unless otherwise expressly permitted by the course instructor.**

### **Tentative Course Outline**

1. Databases and data collection
2. Georeferencing

3. Accuracy/Precision
4. Spatial Interpolations and Modeling
5. Geo-visualization
6. Suitability
7. Spatial Decision Making
8. Geoprocessing
9. Internet-based Mapping
10. Future of GIS

Date (Week Beginning)	Percentage	Lab
11th January	9	Lab 1 : Introduction to Databases and Canadian Online Geospatial Data Portals
18th January		Lab1 : <i>Continued</i>
25th January	9	Lab 2 : Georeferencing - Custom Map Product <b>ArcGIS</b>
1st February		Lab 2 : <i>Continued</i>
8th February		<b>Reading Break</b>
15th February	9	Lab 3 : Suitability - Using <b>Model Builder Automation</b>
22 <sup>nd</sup> February		<i>Lab 3 Continued</i>
29th February	9	Lab 4 : Online Mapping Geoprocessing <b>ArcGIS</b>
7th March		Lab 4 : <i>Continued</i>
14th March	9	Lab 5 : Online Mapping : Interactive, Popups, KMLs <b>Google Earth,</b>
21 <sup>st</sup> March		Lab 5 : <i>Continued</i>
28th March		Lab5 : Report hand in.

### GRADING INFORMATION

The grading scale (which percentages equal which letter grade)

A+	A	A-	B+	B	B-	C+	C	D	F
90-100%	85-89%	80-84%	77-79%	73-76%	70-72%	65-69%	60-64%	50-59%	49% or Less

### **Course Experience Survey (CES)**

I value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete an anonymous survey regarding your learning experience (CES). The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. The survey is accessed via MyPage and can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please be thinking about this important activity during the course.

*Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Resource Centre for Students with a Disability (RCSD) as soon as possible. The RCSD staffs are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations <http://rcsd.uvic.ca/>. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.*

## Example of Type of Evaluation of the Lab Assignments's reports

*Note: these percentages are altered depending on the assignment – which will be posted on the assignment and on Moodle in advance.*

### 15% Style

- Clear writing, good grammar
- Good organization of the report
- Well structured paragraphs
- Easy to understand
- All figures and tables cited
- Overall presentation

### 5% Introduction and Goal

- Has the problem been clearly outlined and the goal of the assignment clearly stated? Set up the problem and state the goal of your write-up/analysis.

### 5% Data

- Describe the data.
- Do your data have any strengths or weaknesses?
- Metadata

### 30% Methods

- Are the methods appropriate for answering the question? Don't take the path of least resistance in your analysis. Where appropriate explore/consider multiple options for analysis
- Demonstrated that you understand the methods
- Clearly write about the steps. I like using flow diagrams to help demonstrate my methods
- Explain why you used each method and why you chose the parameters you did?

### 25% Results

- Are the results presented in a meaningful way?
- Is the presentation clear and does it make sense in terms of the methods outlined.

### 20% Discussion and Conclusion

- Are the results interpreted in a convincing way?
- Are the results interpreted in context of the question?
- Has the question been answered or if not has the reason been explained?
- Has the study (the question, data, methods, and results) been pulled together to provide new or meaningful information. Or, are limitations of the study outlined?
- Critique the accuracy and precision
- Present potential ways of doing this in a more accurate manner

### Lab Report Instructions

Your reports must be typed, 1.5 spaced and Times size 12 font. Reports will be **maximum 4 pages** in length not including figures. Please do **not** exceed the maximum length. Marks will be deducted. All references, figures and tables must be cited in the text.