Geography 165: Computer Cartography: Principles and Design

Contact Information
Instructor: Peter Johnson
Assistant Professor, Department of Geography and Environmental Management,
Office: EV1-236,
Office Hours: Tuesdays 1:00pm to 3:00pm.
If you need to schedule an appointment outside of these drop-in hours, please contact me.
Phone: ext. 33078,
E-mail: peter.johnson@uwaterloo.ca
From Monday to Friday, I make every effort to answer emails within 24hrs. Email sent on the weekend will normally be answered on the following Monday.

Teaching Assistants
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Course Description
This course focuses on the compilation and cartographic display of spatially referenced data. Topics covered include geographic coordinate systems, map projections, mapping quantitative data, terrain representation, compiling data from a variety of sources, and the production of effective maps based on established principles of cartographic design.

Course Outline
Fall 2012
Course Objectives
By the end of the course, students should be able to:
1. Compare and contrast different classes of maps.
2. Identify and distinguish different types of geographic co-ordinate systems and map projections
3. Identify and apply the computer-based techniques for the production of quantitative maps.
4. Recognize and apply the principals of map design to the creation and evaluation of maps.

Course Presentation
Lecture:
Tuesday and Thursday 11:30am to 12:20pm in St. Paul's 105.

Lecture Materials on PowerPoint
The PowerPoint presentations used in the lecture will be provided on LEARN.
Please Note: The PowerPoint files are provided to simplify the note taking process and to ensure that diagrams are copied correctly. I will add many details verbally during class, including explaining diagrams, images, and concepts. You are responsible for all materials presented in lecture - whether that is verbally or included on the PowerPoint slides.

Lab time (section #):

- **Monday** 10:30am – 12:20pm (104)
- **Monday** 4:30pm – 6:20pm (108)
- **Tuesday** 8:30am – 10:20am (106)
- **Wednesday** 8:30am to 10:20pm (101)
- **Wednesday** 10:30am to 12:20pm (102)
- **Wednesday** 2:30pm to 4:20pm (103)
- **Wednesday** 4:30pm to 6:20pm (105)
- **Thursday** 8:30am – 10:20am (107)
- **Thursday** 4:30pm – 6:20pm (109)

The Geddes Lab
Most lab classes will be held in the John Geddes GIS Lab (EV2 1002A). Access to the lab is gained by entering a code in the keypad combination lock on the door of the lab. Do not give the combination to anyone else. We are trying to limit access to this lab to those who need to use it for course work and for those that need to use the specialised software only available on these computers. This will provide you with greater access to the computers in this lab when you need them to complete assignments. Similarly, if someone knocks on the door when you are in the lab, do not open the door or prop the door open. Everyone who needs to get into the Lab can obtain the combination from the Mapping, Analysis and Design (MAD) Helpdesk in EV2 163A or from their course instructor.

Please make sure you carefully backup all digital files that you use or create in this class. Do not leave any of your files on the local lab computer.

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Please note: No food or drink is to be brought into this lab.

Additional Course Resources

Required Textbook
The following text can be purchased at the University of Waterloo Bookstore.


This book has an accompanying web page that provides additional information. See http://www.pearsonhighered.com/slocum3e/

University of Waterloo LEARN Course Environment
LEARN is a web-based course management system that enables instructors to manage course materials (posting of lecture notes etc.), interact with their students (drop boxes for student submissions, on-line quizzes, discussion boards, course e-mail etc.), and provide feedback (grades, assignment comments etc.). Data files required for lab assignments will also be found here.

Logging Into LEARN

Users can login to LEARN via:
http://learn.uwaterloo.ca/
Use your WatIAM/Quest username and password

Documentation is available at:
http://av.uwaterloo.ca/uwace/training_documentation/index.html

Checking Your UserID and Password

Your password can be checked by going to:
https://watiam.uwaterloo.ca:8181/idm/user/login.jsp

Evaluation

Final grades for the course will be assigned as follows:
• 8 Lab Assignments 40%
• Test 1 (October 4th in class) 20%
• Test 2 (November 1st in class) 20%
• Test 3 (November) 29th in class) 20%

100%

Deadlines
Lab assignments are due at the beginning of your lab session on the day specified at the top of the lab. This will normally be either one week after, or two weeks after they have been handed out (Lab 1 is completed in the first session). Lab assignments must be handed in on or before the due date. Late labs will not be accepted. If for some reason you are unable to hand in your lab at the due date, contact your lab T.A. as soon as possible.

Note for Students with Disabilities: The Office for persons with Disabilities (OPD), located in Needles Hall, Room 1132, 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 the OPD at the beginning of each academic term.

Course Outline
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Academic Integrity Policies

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 www.uwaterloo.ca/academicintegrity/ for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, www.adm.uwaterloo.ca/infosec/Policies/policy70.htm. 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 [check www.uwaterloo.ca/academicintegrity/] to avoid committing an academic offence, and to take responsibility for his/her actions. 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, www.adm.uwaterloo.ca/infosec/Policies/policy71.htm. For typical penalties check Guidelines for the Assessment of Penalties, www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm.

Appeals: A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) www.adm.uwaterloo.ca/infosec/Policies/policy72.htm.

Plagiarism Detection Software: Plagiarism detection software (Turnitin) will be used to screen assignments in this course. This is being done to verify that use of all materials and sources in assignments is documented. Students will be given an option if they do not want to have their assignment screened by Turnitin. In the first week of the term, details will be provided about arrangements and alternatives for the use of Turnitin in this course.

Lecture and Lab Schedule*

<table>
<thead>
<tr>
<th>Week of</th>
<th>Lecture Topic(s)</th>
<th>Lab Assignment</th>
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| 11 - Sept. | L01 - Course Overview/Administration  
L02 - The Definition and Scope of Cartography | No labs |
| 17 - Sept. | L03 - The Nature of Maps and Map-Making  
L04 - Geographic Information Systems (GIS) | Lab 1: Mental Maps (4%) |
| 24 - Sept. | L05 - Cartographic Fundamentals  
L06 - Principles of Map Projections | Lab 2: Map Library Resources (4%) |
| 1 - Oct. | L07 - Principles of Map Projections  
**Test 1 (October 4th)** | Lab 3: ArcGIS Tutorial – Map Projections (4%) |
| 8 - Oct. | L08 - Map Co-ordinates  
L09 - Mapping Quantitative Data | Lab 4: Map Co-ordinates and Map Scale (4%) |

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<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Topic</th>
<th>Readings</th>
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<tbody>
<tr>
<td>15 - Oct.</td>
<td>L10 - Mapping Quantitative Data</td>
<td>Lab 5: Quantitative Mapping (8%)</td>
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<td>L11 - Choropleth Maps</td>
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<td>22 - Oct.</td>
<td>L12 - Point Symbol Maps</td>
<td>Lab 5: Quantitative Mapping (8%)</td>
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<td>L13 - Terrain Representation</td>
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<td>29 – Oct.</td>
<td>L14 - Web Mapping</td>
<td>Lab 6: Terrain Mapping (4%)</td>
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<td><strong>Test 2 (November 1st)</strong></td>
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<tr>
<td>5 - Nov.</td>
<td>L15 - Web Mapping</td>
<td>Lab 7: Web Mapping (4%)</td>
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<td>L16 - Principles of Map Design</td>
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<td>12 - Nov.</td>
<td>L17 - Map Design / Cartographic Abstraction</td>
<td>Lab 8: Map Design (8%)</td>
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<td>L18 - Map Design / Colour</td>
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<td>19 - Nov.</td>
<td>L19 - Understanding Error</td>
<td>Lab 8: Map Design</td>
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<td>L20 - How to Lie with Maps</td>
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<td>26 – Nov.</td>
<td>L21 - Next Steps with GIS, Review</td>
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<td><strong>Test 3 (November 29th)</strong></td>
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* The instructor reserves the right to make changes to the schedule as necessary.

Ω **Attention Monday Labs:** All labs normally held on Monday October 8th will be pushed back one week due to the Thanksgiving holiday. Monday labs will finish on December 3rd.

## Reading List

The following chapters will be covered in the course text. This list of readings will be supplemented by materials discussed in class and provided on LEARN. You are expected to follow-up with these supplementary readings as part of your regular reading.

### Lecture Topic

- **Scope of Cartography, Nature of Maps, Cartographic Communication**
  - Chapters 1, 2
- **Geographic Co-ordinates**
  - Chapter 7
- **Map Projections**
  - Chapters 8, 9
- **Map Co-ordinates**
- **Quantitative Mapping**
  - Chapters 4, 5, 6
  - **Choropleth Maps,**
    - Chapter 14
  - **Point Symbol Maps**
    - Chapter 17
- **Terrain Representation**
  - Chapter 16 (excluding Kriging), 20
- **Map Design**
  - Chapters 10, 11, 12
- **Map Misuse**
- **Understanding Error**
  - Chapter 23
- **Digital Map Applications**
  - Chapter 24

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**Course Outline**

Fall 2012