



GEOGRAPHY COURSE OUTLINE: FALL 2017
Geography 437 H (3-3)

Cartography and Geographic Visualization

Section	Days	Time	Location
LEC 01	TuTh	17:00 - 18:15	ES 342
LAB 01	Tu	08:00 - 10:50	ES 307

Primary Instructor (1): Eleanor Bash	Office: ES 438
Telephone: 220-3176	Email: eleanor.bash@ucalgary.ca

Secondary Instructor (2): Dan Jacobson	Office: ES 306
Telephone: 220 6192	Email: dan.jacobson@ucalgary.ca
TA: Danilo Borja Padilla	TA Office: TBD
Telephone:	Email: pablo.borja@ucalgary.ca

Technical Lab Support: Bart Hulshof	Office: ES 402
Email: bhulshof@ucalgary.ca	
Cartographic Support: Robin Poitras	Office: ES 424
Email: rpoitras@ucalgary.ca	

The primary emergency evacuation assembly point for all classes taught in Earth Sciences is the ICT Food Court. The secondary emergency evacuation assembly point is the Social Science Food Court.

COURSE SUMMARY

Official Course Description:

The role of cartography and geographic visualization is explored both theoretically and practically in the communication of spatial data. Topics will relate to major issues in advanced map design and spatial data interaction with examples from the geographic literature. Sample approaches will be critically examined within lecture and laboratories. Computer software packages will be used for laboratories.

Course Objectives:

The primary objective of this course is to build on knowledge and skills from prior geographic methods courses (GEOG 231) geographic information systems (GEOG 357,457) remote sensing (GEOG 333, 433) quantitative (GEOG 339, 439) and qualitative (GEOG 340) courses for the creation and analysis of cartographic products. The course will provide more nuanced insights into cartographic representation and communication. A range of cartographic representations that are appropriate to the data and intended users will be created and critiqued. The course is designed to develop more advanced technical skills that incorporate problem solving, theoretical and critical analysis. Work will be contextualized

within recent debates and techniques in cartography and geovisualization. The course will elevate students' knowledge and skills to a level appropriate for independent cartographic production and research for future use in the workplace/career.

Course Learning Outcomes:

The Department of Geography is committed to student knowledge and skill development. The table below lists the key learning outcomes for this course, the program-learning outcomes they facilitate and the expected level of achievement.

Course Learning Outcomes		Level(s)
Produce a cartographic product appropriate to a dataset	6,7	2
Select, analyze and evaluate appropriate graphic representation techniques for variable temporal, attribute and spatial scales	3, 6,7	2,3
Assess, critique and implement principles of map design: layout, color, symbolization and typography.	6,7	2,3
Implement and analyze data considerations for cartographic processes such as data abstraction, generalization, classification and selection	3,6,7	2,3
Illustrate and compare different methods, media and mechanisms for map production and re-production.	6,7	3
Create, present, discuss, interpret and debate a major cartographic product, in oral and written form that effectively analyses existing literature	3,6,7,8	3
Deconstruct, illustrate and analyze the power, societal, philosophical and gender theories when interpreting map creation, use and evaluation.	4,7,8	3

PLOs = Program Learning Outcomes: 1 = reflect and communicate diverse human-environment perspectives, 2 = identify and explain human-environment processes, 3 = implement sampling, data collection, analyses and communication methods, 4 = analyze spatial and temporal aspects of human-environment systems, 5 = employ knowledge, arguments, and methodologies for solving human-environment problems, 6 = evaluate geospatial data and manipulate it to create cartographic products, 7 = communicate geographic concepts using oral, written, graphic, and cartographic modes, and 8 = demonstrate literacy skills. **Levels:** (1) Introductory, (2) Intermediate, (3) Advanced.

Prerequisites: Geography 231, plus one of Geography 333 or 357

Supplementary Fees: N/A

ASSESSMENT COMPONENTS

Students will be evaluated on (1) laboratory work; (2) the term project; and (3) incorporation of their knowledge of lecture materials into including classroom participation and discussion.

Lab Assignments: Students will undertake a series of lab assignments designed to provide hands-on experience in cartographic design, information communication and geographic visualization. The lab assignments will explore issues of core concepts in cartographic analysis, communication, representation and geographic visualization.

Term Project: All students will complete a term project due on the last day of lectures (December 8, 2017). The goal of each project is to create a complex cartographic product. The term project is expected to demonstrate knowledge of the conceptual issues and research applications in cartography. Term project guidelines will be provided to students' mid-way through the course.

The distribution of marks will be:

Laboratory exercises (4 x 12.5%)	50% (see schedule on D2L)
Term Project	50%
Comprised of:	
Written Proposal	5% (see schedule on D2L)
Sketch map / graphic outline	5% (see schedule on D2L)
Project Presentation and discussion	10% (see schedule on D2L)
Peer project feedback	10%
Product & Report	20% (due last day of lectures)

Criteria That Must Be Met to Pass

A passing grade is required in both the lab and project components to pass the course.

There is no final examination for this course

TEXT(S)/READINGS

There are no required texts. We will be using Desire2Learn (D2L) in this course. If you need help accessing or using D2L, please visit the Desire2Learn resource page for students: <http://elearn.ucalgary.ca/d2l-student/>. Additional readings will be posted to D2L. Recommended texts are listed below.

Recommended Resources:

- Bertin, J. 1967/2011. *Semiology of Graphics: Diagrams, Networks, Maps*. ESRI Press.
- Brewer, C. A. 2005. *Designing Better Maps: A Guide for GIS Users*. ESRI Press. (#)
- Brewer, C. A. 2008. *Designed Maps: A Sourcebook for GIS Users*. ESRI Press.
- Dodge, M., R. Kitchin, and C. Perkins. 2011. *The Map Reader: Theories of Mapping Practice and Cartographic Representation*. Wiley. (#)
- Kraak, M. J., and F. Ormeling. 2010. *Cartography: Visualization of Spatial Data*. Guilford Press. (#)
- Krygier, J., and D. Wood. 2011. *Making Maps: A Visual Guide to Map Design for GIS 2 or 3 ed*. Guilford Press. (# both online)
- MacEachren, M. 1995. *How Maps work*. Guilford Press.
- Monmonier, M. 2014. *How to Lie With Maps*, University of Chicago Press.
- Muehlenhaus, I. 2013. *Web Cartography: Map Design for Interactive and Mobile Devices*. CRC Press
- Price, M. 2015. *Mastering ArcGIS 7th ed*. McGrawHill. [or earlier versions] (#)
- Peterson, G. N. 2009. *GIS Cartography: A Guide to Effective Map Design*. CRC Press (#)
- Peterson, G. N. 2012. *Cartographer's Toolkit: Colors, Typography, Patterns*
- Robinson, A. H., J. L. Morrison, P. C. Muehrcke, A. J. Kimerling, and S. C. Guptill. 2009. *Elements of Cartography 6th ed*. Wiley. (#)
- Slocum, T. A., R. B. McMaster, F. C. Kessler, and H. H. Howard. 2009. *Thematic Cartography and Geographic Visualization 3rd ed*. Pearson Prentice Hall. (*,#)**
- Tyner, J. A. 2014. *Principles of Map Design*. Guilford Press. (#)
- Wood, D. 2010. *Rethinking the Power of Maps*. Guilford Press. (# online)
- (*) indicates available in Geography Collections room ES 457,
(#) indicates available at the Taylor Family Digital Library.
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Technology Requirements and Preparation:

This course assumes that students have a general understanding of mapping, cartography and geographic representation. Students should be familiar with manipulating data in a standard geographic information system such as ESRI's ArcGIS or other open source software such as GRASS or uDig. Experience with other graphic design and manipulation packages such as Adobe Illustrator is advantageous.

ASSESSMENT EXPECTATIONS

Attendance and Participation Expectations:

Attendance is not mandatory, but is strongly recommended. Students must be present, however, to receive marks for in class presentations and for providing feedback on peer presentations.

Expectations for Writing:

Writing skills are not exclusive to English courses and, in fact, should cross all disciplines. The University supports the belief that throughout their University careers, students should be taught how to write well so that when they graduate their writing abilities will be far above the minimal standards required at entrance. Consistent with this belief, students are expected to do a substantial amount of writing in their

University courses and, where appropriate, members of faculty can and should use writing and the grading thereof as a factor in the evaluation of student work. The services provided by the Writing Centre in the Effective Writing Office can be utilized by all undergraduate and graduate students who feel they require further assistance.

Guidelines For Submitting Assignments:

Assignments are due as outlined in the course schedule. Unless otherwise noted above, all assignments will be submitted through D2L.

The University of Calgary Undergraduate Grading System will be used (<http://www.ucalgary.ca/pubs/calendar/current/f-1-1.html>).

96-100	A+	81-85	B+	65-70	C+	55-58	D+
90-95	A	77-80	B	62-64	C	50-54	D
86-89	A-	71-76	B-	59-61	C-	0-49	F

Late Assignments:

Late assignments will not be accepted without prior arrangements having been made, except in the case of an emergency. If you are unable to meet a deadline due to unavoidable life circumstances, arrangements for an extension must be made in advance of the assignment deadline with an instructor or TA. These requests will be reviewed on a case by case basis. If an emergency arises that prevents you from completing an assignment on time, please email the primary instructor as soon as possible so that arrangements can be made. The late policy may be waived at the instructor's discretion in case of an emergency. Emergencies are defined as anything which is serious and unexpected.

The D2L dropbox will be closed at the deadline listed in the course timetable below. For students who have made arrangements for late submissions, assignments should be emailed.

Human subjects:

Students will NOT participate as subjects or researchers on human subjects.

USRI:

At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.

PRINCIPLES OF CONDUCT

The University of Calgary Calendar includes a statement on the Principles of conduct expected of all members of the University community (including students, faculty, administrators, any category of staff, practicum supervisors and volunteers) whether on or off the University's property. This statement applies in all situations where the members of the University community are acting in their University capacities. All Members of the University Community have a responsibility to familiarize themselves with this statement which is available at: <http://www.ucalgary.ca/pubs/calendar/current/k.html>

Internet and electronic communication device information:

Students are welcome to use laptops and tablets in class if they are used to take notes or find information relevant to the class, and if there is *no disturbance or distraction of other students or the instructor*. Please be considerate of others and switch off all MP3 players, cell phones, etc., whenever you enter or leave the classroom. Phones must be turned to silent during class time, unless you are a healthcare or law enforcement professional with appropriate ID.

Recording of lectures:

Please consult the instructor prior to recording lectures.

Intellectual property:

Generally speaking course materials created by instructors (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructors. These materials may not be reproduced, redistributed or copied without the explicit consent of the instructors. The posting of course materials to third-party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course may be allowed under fair dealing.

UNIVERSITY OF CALGARY POLICIES AND SUPPORTS

Academic Integrity / Plagiarism:

Academic dishonesty is not an acceptable activity at the University of Calgary and students are **strongly advised** to read the Student Misconduct section in the University Calendar. Quite often, students are unaware of what constitutes academic dishonesty or plagiarism. The most common are 1) presenting another student's work as your own 2) presenting an author's work or ideas as your own without proper referencing and 3) using work completed for another course. This activity will not be tolerated in this course and students conducting themselves in this manner will be dealt with according to the procedures outlined in the calendar: <http://www.ucalgary.ca/honesty/plagiarism>

Appeals:

If a student has a concern about the course, academic matter, or a grade that they have been assigned, they must first communicate this concern with the instructor. If the concern cannot be resolved with the instructor, the student can proceed with an academic appeal, which begins with the department. <http://www.ucalgary.ca/provost/students/ombuds/appeals>

Academic Accommodations:

Students needing an accommodation because of a Disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities. The procedure can be found at:

ucalgary.ca/policies/files/policies/student-accommodation-policy

Students needing an accommodation based in relation to their coursework or to fulfil requirements for a graduate degree, on a Protected Ground other than Disability, should communicate this need, preferably in writing to their instructor or the appropriate Associate Dean or Department Head.

ucalgary.ca/policies/files/policies/student-accommodation-policy

Students needing an Accommodation unrelated to their coursework or the requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Vice-Provost (Student Experience).

Freedom of Information and Protection of Privacy:

FOIP: The Freedom of Information and Protection of Privacy (FOIP) legislation disallows the practice of having students retrieve assignments from a public place, e.g., outside instructor's office, the department office, etc. Term assignments will be returned to students individually, during class or during the instructor's office hours; if students are unable to pick up their assignments from the instructor, they provide the instructor with a stamped, self-addressed envelope to be used for the return of the assignment.

Re: Posting of Grades and Picking-up of Assignments

- All assignments will be handled through D2L or personally.
- Their own grades will be available to each student on D2L by password access. Grades will not be available at Geography's main office.

Contact Information for Student and Faculty Representation:

- SU VP Academic Phone: 220-3911 and e-mail: suvpaca@ucalgary.ca
- SU Faculty Rep. Phone: 220-3913 and e-mail: arts1@ucalgary.ca

Wellness And Mental Health Resources:

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the excellent mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre,

<https://www.ucalgary.ca/wellnesscentre/services/mental-health-services>) and the Campus Mental Health Strategy website (<http://www.ucalgary.ca/mentalhealth/>).

Campus Safewalk:

Campus Security, in partnership with the Students' Union, provides the Safewalk service, 24 hours a day, to any location on Campus including the LRT, parking lots, bus zones and University residences. Contact Campus Security at 220-5333 or use a help phone, and Safewalkers or a Campus Security officer will accompany you to your Campus destination.

Student Ombuds Office:

The Student Ombuds Office offers a safe place for all students of the University of Calgary to discuss student related issues, interpersonal conflict, academic and non-academic concerns, and many other problems. <http://www.ucalgary.ca/ombuds/>

Make an appointment by calling 403-220-6420 or e-mailing ombuds@ucalgary.ca

Faculty of Arts Program Advising and Student Information Resources:

Have a question, but not sure where to start? The new Faculty of Arts Students Centre is your information resource for everything in Arts!

Drop in at SS 102, call us at 403-220-3580 or email us at ascarts@ucalgary.ca

You can also visit the Faculty of Arts website at <http://arts.ucalgary.ca/undergraduate> which has detailed information on common academic concerns.

For registration (add/drop/swap), paying fees and assistance with your Student Centre, contact Enrolment Services at (403) 210 7625 or visit them at the MacKimmie Library Block.

Contact for Students Union Representatives for the Faculty of Arts:

arts1@su.ucalgary.ca, arts2@su.ucalgary.ca, arts3@su.ucalgary.ca, arts4@su.ucalgary.ca

Preliminary Timetable: Note Lecture topics are subject to change as the course evolves

Week	Date	Topic	Chapter*	Lab	Deliverables
1	Monday, September 11	Semester begins		No lab	
	Tuesday, September 12	Intro and course outline			
	Thursday, September 14	Geovisualization and the process of making a map I	1		
2	Tuesday, September 19	Geovisualization and the process of making a map II	1	Lab 0	Lab 0
	Thursday, September 21	A brief history of information graphics	2		
3	Tuesday, September 26	Classification and symbolization	4,5	Lab 1	
	Thursday, September 28	Map types and Data types			
4	Tuesday, October 03	Projections and Coordinate Systems	6,7,8,9		Initial project idea due Friday, October 6, 2017 at 17:00 via email
	Thursday, October 05	Color and its use	10		
5	Tuesday, October 10	Toponymy, typography and map text	11	Lab 2	Lab 1 due Monday, October 9, 2017 at 23:50 via D2L
	Thursday, October 12	Choropleth and proportional symbol mapping	14,17		Written project proposal due Friday, October 13, 2017 at 17:00 via D2L
6	Tuesday, October 17	Project proposal presentations			
	Thursday, October 19	Project proposal presentations			
7	Tuesday, October 24	Dasymetric and isarithmic mapping	15,16	Lab 3	Lab 2 due Monday, October 23, 2017 at 23:50 via D2L
	Thursday, October 26	Cartograms and flow maps	19		
8	Tuesday, October 31	Multivariate mapping	17,19		
	Thursday, November 02	Map animation	21		

9	Tuesday, November 07	Visual analytics and data exploration	22	Lab 4	Lab 3 due Monday, November 6, 2017 at 23:50 via D2L
	Thursday, November 09	Dealing with uncertainty	23		
<i>Reading break November 10-13</i>					
10	Tuesday, November 14	Web-based cartography	24		Project graphic outline due Monday, November 13, 2017 at 17:00 via D2L
	Thursday, November 16	Cartography in virtual environments	25		
11	Tuesday, November 21	Representing non-traditional data		Open lab time	Lab 4 due Monday, November 20, 2017 at 23:50 via D2L
	Thursday, November 23	Research in cartography and visualization	26		
12	Tuesday, November 28	Project Presentations		Open lab time	
	Thursday, November 30	Project Presentations			
13	Tuesday, December 05	Project Presentations		Open lab time	Final Project due Friday, December 8, 2017 at 23:50 via D2L
	Thursday, December 07	Project Presentations			
	Friday, December 08	End of Classes			
* Chapter numbers are from Slocum, T. A., R. B. McMaster, F. C. Kessler, and H. H. Howard. 2009. Thematic Cartography and Geographic Visualization 3rd ed.					