

**GEOGRAPHY COURSE OUTLINE: FALL 2018
GEOGRAPHY 437 H (3-3)**

Cartography and Geographic Visualization

Section	Days	Time	Location
LEC 01	TuTh	17:00 – 18:15	ES 342
LAB 01	We	14:00 – 16:50	ES 307

Instructor: Dan Jacobson	Office: ES 306
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TA: Danilo Borja	TA Office: ES 310
TA: Email: pablo.borja@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

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 to which they contribute, and the expected level of achievement.

Course Learning Outcomes	PLO(s)*	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, and 3 = Advanced.*

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

Learning Resources:

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 later in this document.

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 systems such as ESRI's ArcGIS or other open source software such as GRASS, QGIS or uDig. Experience with other graphic design and manipulation packages such as Adobe Illustrator is advantageous.

ASSESSMENT COMPONENTS

Students will be evaluated on (1) laboratory work; (2) the term project; and (3) incorporation of their knowledge of lecture materials into 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 last course lecture (Thursday December 7, 2018). 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.

Grading (Weighting)

The distribution of marks will be:

Lab 0:	An orientation to software used in the course, and lab policies.		
	A training and practice exercise.	(ungraded)	
<i>Laboratory exercises</i>			
Lab 1	Map design and layout	10%	due 24 Sept.
Lab 2	Working with map projections	10%	due 15 Oct.
Lab 3	Thematic and multivariate mapping	10%	due 29 Oct.
Lab 4	Online and web mapping	20%	due 26 Nov.
		50%	

Term Project

Comprised of:

	Initial idea		due 28 Sept.
	Written Proposal	5%	due 12 Oct.
due 26 Oct.	Sketch map / graphic outline	5%	
Nov. 4, 6 Dec.	Project Presentation and discussion	10%	27, 29
4, 6 Dec.	Peer project feedback	10%	27, 29 Nov.
2018)	Product & Report	20%	(due last class lecture, December 6,
		50%	

Criteria That Must Be Met to Pass

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

Policy regarding rounding of final grades

To be equitable to all students in the class, your individual grade will not be “rounded” or “bumped” up, regardless of how close you are to a grade break. In short, the final grade breaks are hard breaks. This policy minimizes ambiguity and ensures the grading is as fair and clear as possible.

There is no final examination for this course

Grading System

The University of Calgary Undergraduate Grading System will be used:

See: <https://www.ucalgary.ca/pubs/calendar/current/f-1-1.html> for more information

A+	4.00	96-100	Outstanding performance
A	4.00	91-95	Excellent performance
A-	3.70	86-90	Approaching excellent performance
B+	3.30	81-85	Exceeding good performance
B	3.00	76-80	Good performance
B-	2.70	71-75	Approaching good performance
C+	2.30	66-70	Exceeding satisfactory performance
C	2.00	61-65	Satisfactory performance
C-	1.70	56-60	Approaching satisfactory performance.
D+	1.30	51-55	Marginal pass. Insufficient preparation for subsequent courses in the same subject
D	1.00	46-50	Minimal Pass. Insufficient preparation for subsequent courses in the same subject.
F	0.00	0-45	Failure. Did not meet course requirements.

COMMUNICATING WITH YOUR INSTRUCTOR

I will hold regular office hours during the fall semester on Wednesdays from 10 am to Noon, or you can make an appointment via email.

Email communication: All email must have GEOG 437 at the beginning of the subject line, also include a brief comment as to the nature of your email in the subject line. Without GEOG 437 in the subject line it is likely that I will miss your email in the dozens that I receive each day. Please be aware that emails will be intended to be answered within 24 to 48 hours.

Regarding the formality of emails

Consider all emails to be formal correspondence, **NOT** TWEETS or TEXT MESSAGES. At minimum, this means that you should include: (1) a greeting; (2) a message that is clearly written with complete sentences and proper punctuation; and (3) your full name and student number.

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 Writing Support Services can be utilized by all undergraduate and graduate students who feel they require further assistance: www.ucalgary.ca/ssc/writing_support/overview.

Guidelines for Submitting Assignments:

Assignments are due as outlined in the course schedule. Unless otherwise noted, all assignments will be submitted in a PDF format through D2L. Detailed guidelines will be posted.

Late Assignments Policy:

All assignments must be submitted by the specified due date and time.

The D2L drop box 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.

The only acceptable reasons for missing an examination or assignment in this class, as listed in the Deferral of final Examinations section of the University of Calgary Calendar are “debilitating illness, severe domestic affliction, religious conviction or absence due to a faculty-approved activity”. Without appropriate documentation, you will receive a zero for that portion of your grade. Late assignments will not be accepted without prior arrangements having been made, except in the case of an emergency. If an emergency arises that prevents you from completing an assignment on time, please email Dr. Jacobson as soon as possible so that arrangements can be made.

Human subjects:

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

Supplementary Fees:

N/A

For additional detailed course information posted by the instructor, visit the course Desire2Learn page online at <https://d2l.ucalgary.ca/d2l/home>.

SUPPLEMENTAL INFORMATION

Writing across the Curriculum

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, faculty members can and should consider quality of writing as a factor in the evaluation of student work.

The services provided by Writing Support Services can be utilized by all undergraduate and graduate students who feel they require further assistance: www.ucalgary.ca/ssc/writing_support/overview.

Academic Accommodations

It is the student's responsibility to request academic accommodations, according to the university policies and procedures listed in the University Calendar.

The student accommodation policy can be found at: www.ucalgary.ca/access/accommodations/policy. 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: www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf.

Students needing an accommodation based on a protected ground other than disability should communicate this need, preferably in writing, to the Department Head (email: geograph@ucalgary.ca).

Principles of Conduct

The University 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 university property. This statement applies in all situations where members of the university community are acting in their university capacities. All members of the university community have a responsibility to familiarize themselves with the principles of conduct statement, which is available at: www.ucalgary.ca/pubs/calendar/current/k.html.

Plagiarism, Cheating, and Student Misconduct

The University of Calgary is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect.

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 at: www.ucalgary.ca/pubs/calendar/current/k-3.html. 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 adequate citation, and (3) using work completed for another course. Such activities will not be tolerated in this course, and students suspected of academic misconduct will be dealt with according to the procedures outlined in the calendar at: www.ucalgary.ca/pubs/calendar/current/k-5.html.

Internet and electronic communication device information:

Phones must be turned off during class, unless you have previously identified yourself to the instructor as a health care or law enforcement professional.

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*. This policy may be revoked at the discretion of the instructor. In some lectures laptops may not be used.

Please be considerate of others and switch off all MP3 players, cell phones, etc., whenever you enter or leave the classroom. The use of any calculators will not be allowed.

Recording of lectures:

Please consult the instructor prior to recording lectures.

Intellectual property:

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.

Freedom of Information and Protection of Privacy

Freedom of Information and Protection of Privacy (FOIP) legislation in Alberta disallows the practice of having students retrieve assignments from a public place, such as outside an 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 must provide the instructor with a stamped, self-addressed envelope to be used for the return of the assignment.

Posting of Grades and Picking-up of Assignments

Graded assignments will be returned by the instructor or teaching assistant personally during schedule lecture or laboratory periods, unless they are made available electronically through the course D2L webpage. Grades and assignments will not be available at the Department of Geography's main office.

Faculty of Arts Program Advising and Student Information Resources

Have a question, but not sure where to start? The 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 provides detailed information about common academic concerns.

For guidance on course registration (add, drop, swap), information about paying fees, and assistance with your Student Centre, contact Enrolment Services at 403-210-7625 or visit them at the MacKimmie Block.

Contact Information for Student and Faculty Representation

- SU VP Academic Phone: 220-3911 and e-mail: suwpaca@ucalgary.ca
- SU Faculty Rep. Phone: 220-3913 and e-mail: arts1@ucalgary.ca
- The students ombudsman office information can be found at: www.ucalgary.ca/ombuds/

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 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 station, 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.

USRI Surveys

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, so please participate in USRI surveys.

PRELIMINARY SCHEDULE OF LECTURES*

*Lectures and readings subject to change

Geography 437 Cartography y Geovisualiz ation F18	Tuesday Lecture ES342 17:00 – 18:15	Wednesday LABS ES 307 14:00 – 16:50	Thursday Lecture ES342 17:00 – 18:15
Week 1 6/9	NO CLASS	NO LAB	Course Outline and Introduction
Week 2 11/9 13/9	Geovisualization and the process of making a map	LAB 0 – Software orientation	Geovisualization and the process of making a map II
Week 3 18/9 20/9	The human vision system: vision, perception, cognition and behavior	LAB 1 Basic Map Compilation / Layout and Design	Principles of map design and layout
Week 4 25/9 27/9	A brief history of cartography	LAB 1 Basic Map Compilation / Layout and Design	A brief history of information graphics
Week 5 2/10 4/10	Introduction to Projections and Coordinate Systems	Lab2 Working with map projections	Toponymy, typography and map text

Week 6 9/10 11/10	Representing Geographic Phenomena and Data Classification and symbolization	Lab2 Working with map projections	Map types and Data types
Week 7 16/10 18/10	Thematic cartography, geovisualization and visual analytics Choropleth and proportional symbol mapping	Lab 3 Thematic and multivariate mapping	Color and its use
Week 8 23/10 25/10	Dasymeric and isarithmic mapping	Lab 3 Thematic and multivariate mapping	Multivariate mapping Cartograms and flow maps
Week 9 30/10 1/11	Web-based cartography I	LAB 4 Web and online mapping	Web-based cartography II
Week 10 6/11 8/11	Representing non-traditional data	LAB 4 Web and online mapping	Research in cartography and visualization
Week 11 13/11 15/11	<i>Term Break, no classes</i>		<i>Term Break, no classes</i>
Week 12 20/11 22/11	Case study – Tactile and haptic maps	LAB 4 Web and online mapping	Case study – Auditory cartography
Week 13 27/11 29/11	Project presentations	Project Lab Time	Project presentations
Week 14 4/12 6/12	Project presentations	Project Lab Time	Project presentations

Useful Cartography Book Resources:

Additional lab and lecture related material will be posted throughout the semester.

(*) Indicates available in Geography Collections room ES 457,

(#) indicates available at the Taylor Family Digital Library.

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)