Term Information

Effective Term	Summer 2017

General Information

Course Bulletin Listing/Subject Area	Geography
Fiscal Unit/Academic Org	Geography - D0733
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	2200.02
Course Title	Mapping Our World
Transcript Abbreviation	Mapping Our World
Course Description	Study abroad in Scandinavia. Introduction to the power of maps, covering spatial representation, visual literacy, and geographic information technology in a global society.
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	4 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	Yes
Is any section of the course offered	Less than 50% at a distance
Grading Basis	Letter Grade
Repeatable	No
Course Components	Field Experience, Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Always
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites	Permission of instructor
Exclusions	Not open to students with credit for GEOG 2200.01 or GEOG 480.

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	45.0701
Subsidy Level	Baccalaureate Course
Intended Rank	Freshman, Sophomore, Junior, Senior

Requirement/Elective Designation

General Education course:

Data Analysis

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Students will employ basic methods of spatial data-gathering, presentation, and interpretation
- Students will interpret map symbology in order to analyze and critically evaluate the spatial structure of and relationships among spatial phenomena
- Students will demonstrate familiarity with some basic concepts of descriptive and inferential statistics and understand some unique properties of spatial statistics
- Students will apply statistical ideas to seek explanations for unusual or interesting patterns on maps
- Students will evaluate the impact of spatial data sampling and uncertainty on map use

Content Topic List

- Introduction to geographic data
- Geovisual literacy
- The mapping process
- Methods of spatial data gathering, presentation, and interpretation
- Interpretation of map symbology
- Mapping with descriptive, inferential, and spatial statistics
- Application of statistical ideas for map analysis and evaluation

Attachments

- 2200.02 syllabus.pdf: 2200.02 syllabus

  (Syllabus. Owner: Coleman,Mathew Charles)
- 2200.02 Tech Review Checklist.pdf: 2200.02 tech checklist

  (Other Supporting Documentation. Owner: Coleman,Mathew Charles)
- 2200.02 CH rationale.docx: 2200.02 CH rationale

  (Other Supporting Documentation. Owner: Coleman,Mathew Charles)
- 2200.02 GE explanation.docx: 2200.02 GE rationale

  (GEC Model Curriculum Compliance Stmt. Owner: Coleman,Mathew Charles)
- 2200.02 GE assessment.docx: 2200.02 GE assessment

  (GEC Course Assessment Plan. Owner: Coleman,Mathew Charles)
- 2201.01 syllabus--in-class syllabus.pdf: in-class syllabus

  (Syllabus. Owner: Vankeerbergen,Bernadette Chantal)

Comments

- N/A *(by Coleman,Mathew Charles on 01/17/2017 04:04 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Coleman,Mathew Charles	01/17/2017 04:04 PM	Submitted for Approval
Approved	O'Kelly,Morton Edward	01/17/2017 04:22 PM	Unit Approval
Approved	Haddad,Deborah Moore	01/17/2017 04:59 PM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler	01/17/2017 04:59 PM	ASCCAO Approval

College of Arts & Sciences
Department of Geography

THE OHIO STATE UNIVERSITY

SYLLABUS: GEOG/2200.02
MAPPING OUR WORLD – SOUTHERN SCANDINAVIA EDUCATION ABROAD
SUMMER TERM 2017 (CLASS NUMBER)

3 CREDIT (SEMESTER) HOURS

ONLINE & IN-COUNTRY

Course overview

Instructors

	Prof. Ola Ahlqvist, PhD	Prof. Darla Munroe, PhD
Email address:	ahlqvist.1@osu.edu	munroe.9@osu.edu
Phone number:	614-247-7997	614-247-8382

Meeting days and times

This is a mixed delivery, online and study abroad, course that spans the full 12-week summer session. There are ten course modules, delivered through Carmen, Ohio State's learning management system. Five of these modules will be completed entirely online, before and after the education abroad component. The other five modules will be completed during a two-week education abroad program at Lund University, Sweden, directed by the same Ohio State faculty that are the instructors of this course.

Course description

The powerful language of maps visually shows trends, and patterns that are not apparent in other data presentations; Corporations, government, media, and researchers use maps and geographic information technology to understand and visualize data on for example natural resources, flows of trade, historical events, property management, and diseases. In this course we will explore what makes spatial information special, how and why maps are such a powerful tool to understand an increasingly complex world, and how modern technology is currently

transforming the art and science of map making. In hands-on field work, practical exercises and discussions students will develop the knowledge, skills, and dispositions that constitute geographic information literacy.

This combined online + field-based, study abroad offering of Geog 2200 will provide students a unique opportunity to enrich the core learning objectives of the course with an applied and contextualized setting for the many practical assignments in the course. Through an education abroad setting, students will study data analysis in a series of thematic application areas – history, geology, climate, population, politics, economy, weather, and cyberspace. Students will recognize and gain a hands-on understanding of the impact of basic statistical ideas in real contexts that enhance their understanding of the host country and how these are relevant to daily life. The use of geographic information systems software in computer exercises present students with opportunities to apply concepts they learn online, in the classroom and in the field. Students will practically use data analysis as a way to understand and assess similarities and differences between places they visit and between Sweden and the U.S.

To help you succeed in this course, the University offers a range of academic support services. Please consult the student support pages at http://advising.osu.edu/welcome.shtml, or your own College support services to find the type of support that will help you, or talk to us if you have questions. For other academic matters the Student Service Center http://ssc.osu.edu/ can help with a range of issues related to paying tuition and fees, track financial aid, register for classes, view your grades, get important updates and much more.

Course learning outcomes

By the end of this course, students should successfully be able to:

- employ basic methods of spatial data-gathering, presentation, and interpretation
- interpret map symbology in order to analyze and critically evaluate the spatial structure of and relationships among spatial phenomena
- demonstrate familiarity with some basic concepts of descriptive and inferential statistics in order to understand some unique properties of spatial statistics
- apply statistical ideas to seek explanations for unusual or interesting patterns on maps
- evaluate the impact of spatial data sampling, uncertainty and scale on map use
- demonstrate a basic familiarity with Sweden/Scandinavia and articulate how their time abroad has enriched their academic experience

General Education (GE)

This course meets the requirements of the General Education category **Data Analysis**. The intent of the Data Analysis GE is to enable students to deal with problems of data-gathering, presentation, and interpretation. Students should develop an understanding of problems of measurement, be able to deal critically with numerical and graphical arguments, gain an

understanding of the impact of statistical ideas in daily life and specific areas of study, and recognize the uses and misuses of statistics and related quantitative arguments.

The GE goals for Data Analysis are: Students develop skills in drawing conclusions and critically evaluating results based on data.

GE Expected Learning Outcomes: Students understand basic concepts of statistics and probability, comprehend methods needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas.

This course meets these goals and objectives by exposing students to the problems of real-world data gathering, presentation, and interpretation, in the context of spatial, statistical maps.

Course materials

Required

Kimerling, A. J., Buckley, A. R., Muehrcke, P. C., & Muehrcke, J. O. (2016). *Map Use: Reading, Analysis, Interpretation*. 8th Ed., Esri Press, 664p. http://a.co/gvyHyBP

How to Lie With Maps, 2nd Edition. Mark Monmonier, 1996. I think there are PDFs of this available on the web. http://a.co/gAk5tYr

Both books are available through Amazon (links) in both electronic and hardcopy format.

Supplemental materials

Additional required readings will be posted under each module on Carmen

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.

- **IT Self-Service and Chat support:** http://ocio.osu.edu/selfservice
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Baseline technical skills necessary for online courses

- Basic computer and web-browsing skills
- Navigating Carmen

Technology skills necessary for this specific course

- Recording a slide presentation with audio narration

- Recording and submitting video in Carmen

Necessary equipment you need regular access to

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed
- Microphone: built-in laptop or tablet mic or external microphone

Necessary software

- ArcGIS online, sign up for a free account (http://www.arcgis.com/)
    - Esri Privacy Statement http://www.esri.com/legal/privacy
    - Esri accessibility statement http://www.esri.com/legal/section508
    - Online help and support pages http://doc.arcgis.com/en/arcgis-online/
- Google Earth for desktop (free) https://www.google.com/earth/, fully installed.
    - Google Privacy Policy https://www.google.com/intl/en/policies/privacy/
    - Google accessibility statement https://www.google.com/accessibility/
    - Online help and support pages https://support.google.com/earth/
- GeoDa for desktop (free) http://geodacenter.github.io/, fully installed. This is an academic research tool with limited support, so we will introduce this tool during the in-country module 8 to help you get started.
    - Online help and support pages https://geodacenter.github.io/support.html
    - There are no known privacy or accessibility statements available for this software

Course schedule, grading and faculty response

Schedule, due dates and grade distribution

Course Modules	Activities	Due date	% of grade (roughly)	Online (O)/ in-country (I)
1. Course welcome & logistics	▪ Lecture video – course introduction ▪ Getting acquainted survey - you tell us a bit about yourself in a Carmen survey ▪ Getting acquainted video response - you record a video of yourself ▪ Getting to know your peers - you copy some of your survey responses to a small group discussion as an introduction to some of the other students ▪ Lecture video – syllabus review w. quiz	**June 2**	**6**	**Online**

	▪ Intro to ArcGIS online (AGOL) activity - get to know the main course technology ▪ End of module quiz on the Syllabus and course policies			
2. Why is spatial special? Introduction to geographic information, map types, and projections	▪ Reading Chapters 1-3 ▪ The power of geographic information? - watch a video about geographic data analysis and respond to a few questions ▪ Lecture video – Spatial is Special ▪ Map examples exercise ▪ Lecture video – Map coordinates and projections ▪ Measure your Lat./Long. Position in the U.S activity	**June 2**	**6**	**Online**
3. Visual variables, remote sensing and image maps	▪ Reading Chapters 7-8 ▪ Lecture video – Measurements, data types, types of statistics ▪ Identifying data types on maps activity w. quiz ▪ Lecture video – Qualitative and quantitative visual variables ▪ Qualitative and quantitative maps activity w. quiz	**June 2**	**6**	**Online**
4. Orientation to Lund and Sweden **Spatial observations**	▪ Module 1-2 review ▪ Field work – Measure your Lat./Long. position in Sweden activity ▪ Lecture – Spatial observations ▪ Field work – Spatial observations in city of Lund ▪ Observations write-up – Carmen submission ▪ Readings – Meinig (1979) 10 Landscape views	**June 14**	**11**	**In-country**
5. Field work essentials **Data types and map design**	▪ Module 3-4 review ▪ Field work – Structured data recording and mapping collection in the field, city of Lund ▪ Lecture - Map design ▪ Lab – Data entry and map design activity ▪ Readings – Chapter 6		**13**	**In-country**
6. Hot and cold: weather patterns and what makes a climate **Autocorrelation - Interpolation**	▪ Module 5 review ▪ Lecture - Climate data, Isoline maps, intro to autocorrelation ▪ Field work – Excursion NW Scania ▪ Lecture – interpolation, inferential statistics ▪ Lab – Data entry, interpolation, mapping ▪ Readings – Chapter 9 & 16		**13**	**In-country**

7. Isoline maps and analysis **Introduction to final assignments and term paper**	▪ Module 6 review ▪ Lecture – generalization and map accuracy ▪ Field work – Excursion SE Scania ▪ Lecture – image maps, land cover, map uncertainty ▪ Lab – Map accuracy, error measures ▪ Readings – Chapter 10 & 11		**15**	**In-country**
8.	▪ Module 7 review ▪ Lecture – overview of modules 9-10 and final paper ▪ Term paper proposals	**June 23**	**3**	**In-country**
9. The wealth of nations and their connections **Multi-variate data and visualization**	▪ Intro to GeoDa activity w. quiz ▪ Lecture - Multi-variate data and visualization ▪ Lab – Multivariate Spatial data exploration and autocorrelation ▪ Readings – Chapter 18 ▪ Online quiz		**6**	**Online**
10. Spatial pattern analysis **Spatial association analysis**	▪ Video Lecture - Intro to point patterns ▪ Lab – Spatial pattern analysis ▪ Readings – Chapter 17 ▪ Online quiz		**6**	**Online**
11. Term paper	▪ Term paper submission ▪ Recording a slide presentation with audio narration ▪ Discussion forum on presentations		**15**	**Online**

While the vast majority of online assignments can be completed entirely in front of your computer, there may be a few that require you to be active beyond your computer. During the in-country part of the course there will be a mixture of lectures, computer labs and plenty of field work collecting data and making field observations. At the end of the course there will also be a capstone paper assignment.

Each online module typically requires about 6-8 hours of work. These online modules are divided into smaller assignments (see bulleted activities in the schedule above) that typically require some form of response or submission. Each activity in the modules will specify the estimated time to complete it so you can plan your work (this level of detail is not possible to provide now). The modules are designed to be completed in sequence so you will not be able to start the next module until you have completed the previous one. You may complete the online modules at any time but modules 1-3 need to be completed and submitted by June 2, you will

complete modules 4-8 during the education abroad time in Lund, and modules 9-11 need to be submitted by the last day of summer term, July 28.

Preliminary in-country detailed schedule - week I - June 11-17

Sunday June 11

All day	Students arrive at Copenhagen Airport, travel by train, or by other means, on their own to Lund University
Evening	Student Orientation, dinner and introductions, dorm logistics.

Monday, June 12 (Module 4)

10:00 – 12:00	Lecture: Orientation to Lund and Sweden, classroom and building logistics
Lunch	Lunch at local restaurant, dagens rätt 70-100SEK (8-12.50 USD)
13:00 – 16:00	Guided city walk, orientation to Lund, guided grocery shopping for dinner
18:00 – 20:00	Dinner and first reflections

Tuesday, June 13 (Module 4)

9:00 am – 12:00	Lecture: Module 1-2 review, Spatial observations
13:00 – 15:00	Field work: data collection in the field, city of Lund

Wednesday, June 14 (Module 4/5)

9:00 am – 12:00	Lab: Data entry and map design
13:00 – 15:00	Lecture: Module 3-4 review, map design, visual variables
18:00 – 20:00	Dinner and second reflection

Thursday, June 15 (Module5)

9:00 am – 12:00	Lecture: Data types, descriptive statistics and field work essentials
13:00 – 15:00	Field work: Structured data collection in the field, Lund vicinity

Friday, June 16 (Module5)

9:00 am – 12:00	Lab 3: data analysis, lab reporting and discussion/reflections

Saturday & Sunday, June 17-18

Free time for own activities/travel – suggested itineraries to Malmö, Copenhagen, Gothenburg, Stockholm,

Preliminary in-country detailed schedule - week II - June 18-24

Saturday & Sunday, June 17-18

Free time for own activities/travel – suggested itineraries to Malmö, Copenhagen, Gothenburg, Stockholm,

Monday, June 19 (Module 6)

8:00 – 18:00	Field work: All-day excursion NW Scania (see sample guide): data collection, observation
	Lunch at local restaurant en-route

Tuesday, June 20 (Module 6)

9:00 am – 12:00	Lecture: climate data, isoline maps, interpolation, and inferential statistics
13:00 – 15:00	Lab: Spatial data interpolation and mapping of climate records

Wednesday, June 21 (Module 7)

8:00 – 18:00	Field work: All-day excursion SE Scania: data collection, observation
	Lunch at Kåseberga fisherman's dock

Thursday, June 22 (Module 7)

9:00 am – 12:00	Lecture: Image maps, map uncertainty
13:00 – 15:00	Lab: Map accuracy, error measures

Friday, June 23 (Module 8)

9:00 am – 11:00	Lecture: Module 7 review, outlook on final modules, term paper proposals, and wrap-up
12:00 – 18:00	Travel to Sofiero Castle for traditional midsummer celebration
18:00 -	Farewell dinner

Saturday & Sunday, June 24-25

All-day	Move out of dorms and travel

Possible own travel – suggested itineraries to Oslo, Helsinki, Kiruna

Late assignments

All course work are expected by the due date. A late penalty of at least 10 percentage units will be taken off each day after the due date.

Grading scale

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70 –72.9: C-
67 –69.9: D+
60 –66.9: D
Below 60: E

Faculty feedback and response time

The following list will give you an idea of our intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

Grading and feedback

Most online assignments are small and will usually be graded within a few days. However, we will not release any correct answers until the due date for each assignment/module has passed. During the in-country time you will constantly be in contact with the instructors and get immediate help and feedback on assignments.

E-mail

During the online portion we will typically respond to e-mails within **24 hours on school days, but please allow up to 48 hours**.

Discussion board/office hours

As this course is partially delivered online, you will need to communicate with instructor and teaching assistants via the Carmen course webpage or through email during that part of the course.

For general questions related to the course:

1. Consult the **DISCUSSION : Course Q&A** in Carmen and use the search function. We check and respond to these messages regularly and you may find that we've already addressed your question.

2. If you don’t find an answer, post your question to the discussion board. Your classmates may provide an answer before us.

For questions on personal matters:

1. The open discussion is not appropriate for questions about your grade, illness, et c. In those situations an e-mail is the best way to contact us.

We will typically check and reply to e-mails and messages in the discussion boards every **24 hours on school days, but please allow up to 48 hours**.

Attendance, participation, and discussions

Student participation requirements

Because this is a hybrid online/education abroad course, your attendance is based both on your online activity and participation during the in-country portion of the course. The following is a summary of everyone's expected participation:

- **Logging in:**
  We recommend that you check each module content early on so you can plan accordingly. If you do not login to the course and complete assignments in Carmen by each due date, you will lose important points toward your final grade. If you have a genuine reason (known medical condition, a pile-up of due assignments on other courses, ROTC, athletics teams, job interview, religious obligations etc.) for being unable to complete work on time, then some flexibility is possible. However, if in our judgment you could reasonably have let us know beforehand that there would likely be a delay, then a late penalty will still be imposed if we don't hear from you until after the deadline has passed. For unforeseeable problems, we can be more flexible.
- If there are ongoing medical, personal, or other issues that are likely to affect your work all semester, then please contact the instructors to discuss the situation.

Discussion, communication, and writing guidelines

The following are general expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style**: Written assignments should have a professional tone. For discussions and other communication there is no need to act as if you were writing a research paper, but you should still remember to write using good grammar, spelling, and punctuation.
- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.

- **Citing your sources**: When you write academically, please cite your sources to back up what you say. (For books and articles, list at least the author, year and title. For online sources, include a link.)
- **Backing up your work**: Consider composing your work in a word processor, where you can save your work, and then copying into the Carmen items.

Other course policies

Academic integrity policy

Policies for this online course

- **Assignments**: Most modules contain several small assignments that include questions. You must complete all assignments yourself, without any external help or communication, unless the instructions specifically says something else.

  Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow a consistent citation style (e.g. MLA, APA) to cite the ideas and words of your research sources. You are free to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.
- **Reusing past work**: In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss this with us before submitting it.
- **Falsifying research or results**: All work you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your research look more successful than it was.
- **Collaboration and informal peer-review**: The course includes several opportunities for collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on a quiz or assignment is not permitted. If you're unsure about a particular situation, please feel free to ask us ahead of time.

Ohio State's academic integrity policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/csc/.

What this really means: If we suspect that a student has committed academic misconduct in this course, we are obligated by University Rules to report our suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. Please do not put yourself in that situation.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- *Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)*
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact us.

Accessibility accommodations for students with disabilities

The University strives to make all learning experiences as accessible as possible. Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614-292-3307, slds@osu.edu; slds.osu.edu.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

Geography 2200.01 –

AU/SP 20XX

Mapping our World

SYLLABUS

3 credit (semester) hours

Time: TBD

Location: TBD

Instructor: Ola Ahlqvist, PhD, Associate Professor, Geography

Office phone: 247-7997

Office address: 1049B Derby Hall, 154 N Oval Mall

Office hours: TBD

GTA: TBD

Office address: TBD

Office hours: TBD

Course Description

The powerful language of maps visually shows trends, and patterns that are not apparent in other data presentations; Corporations, government, media, and researchers use maps and geographic information technology to understand and visualize data on for example natural resources, flows of trade, historical events, property management, and diseases. In this course we will explore what makes spatial information special, how and why maps are such a powerful tool to understand an increasingly complex world, and how modern technology is currently transforming the art and science of map making. In hands-on field work, practical exercises and discussions students will develop the knowledge, skills, and dispositions that constitute geographic information literacy.

The main goal is to give students a geovisual literacy foundation (including spatial quantitative reasoning methodologies) so students can realize the value of geographic knowledge and develop their ability to analyze real-world, critical problems such as understanding international markets, demographic patterns, business locations, natural disaster recovery and responses, watershed preservation, and much more. Specifically, the following course objectives have been identified:

After successfully completing this course, students should be able to:

- employ basic methods of spatial data-gathering, presentation, and interpretation
- interpret map symbology in order to analyze and critically evaluate the spatial structure of and relationships among spatial phenomena
- demonstrate familiarity with some basic concepts of descriptive and inferential statistics in order to understand some unique properties of spatial statistics
- apply statistical ideas to seek explanations for unusual or interesting patterns on maps
- evaluate the impact of spatial data sampling, uncertainty and scale on map use

GE Data Analysis

This course meets the requirements of the General Education category Data Analysis. The intent of the Data Analysis GE is to enable students to deal with problems of data-gathering, presentation, and interpretation. Students should develop an understanding of problems of measurement, be able to deal critically with numerical and graphical arguments, gain an understanding of the impact of statistical ideas in daily life and specific areas of study, and recognize the uses and misuses of statistics and related quantitative arguments.

The GE goals for Data Analysis are: Students develop skills in drawing conclusions and critically evaluating results based on data.

Expected Learning Outcomes: Students understand basic concepts of statistics and probability, comprehend methods needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas.

This course meets these goals and objectives by exposing students to the problems of data gathering, presentation, and interpretation, in the context of spatial, statistical maps.

Texts

Required:

Kimerling, A. J., Buckley, A. R., Muehrcke, P. C., & Muehrcke, J. O. (2011). *Map Use: Reading and Analysis*. 7th Ed., Esri Press.

How to Lie With Maps, 2nd Edition. Mark Monmonier, 1996. I think there are PDFs of this available on the web.

The New York Times, or other newspaper with good maps and graphics in their coverage of current events.

You will be asked to present to the class and discuss the design of maps on current events. This activity will be ongoing throughout the quarter. Free copies of NYT are available to students in the residence halls and student discounted personal subscriptions run ~$20 for the semester.

Additional required readings will be provided in Carmen

Schedule

	Geography 2200.01 – AU/SP 201X schedule

	Tuesday	Thursday
12 Jan	Why is spatial special? Introduction to geographic information	Lab 1 - Spatial observations
19 Jan	Spatial observations	Lab 1 continued
26 Jan	Visual Variables	Lab 2 - Drawing a map
2 Feb	Map coordinates and projections	Lab 2 continued
9 Feb	Hot and cold: weather patterns and what makes a climate	Lab 3 – Isoline climate maps
16 Feb	Isoline maps and analysis	Lab 3 continuted
23 Feb	Crossing the line: the nature and significance of political boundaries	Lab 4 – Map accuracy and uncertainty
2 Mar	Remote sensing and image maps	Lab 4 continued
9 Mar	Where’s Wall Street? The wealth of nations and their connections	Lab 5 – Spatial data exploration and autocorrelation
16 Mar	Spring	Break
23 Mar	Multi-variate data and visualization	Lab 5 continued
30 Mar	Spatial pattern analysis	Lab 6 - Spatial pattern analysis
6 Apr	Spatial association analysis	Lab 6 continued
13 Apr	Volunteered geographic information and the new Wiki cartography	What can maps do for us? Personally selected topic related to the course material
20 Apr	Paper idea presentations	Paper idea presentations
27 Apr		

		Wednesday 8:00 Final paper due	

The most up to date schedule will be on Carmen under Course info. Any significant changes to the schedule will be announced well in advance.

Lectures

TBD

Class material such as lecture notes, worksheets, handouts will be made available through Carmen under the heading Lectures.

During lectures we will often spend some time to work with sample problems and discuss practical applications. These activities are meant to build a deeper understanding of the subject matter but they also rely heavily on your active participation. There will also be seven practical exercises that will be introduced during class time but will have to be completed outside of scheduled class time.

Grading Policy

Overall credits for the course are given approximately as follows:

In-Class Participation: 10%

This includes a short in-class presentation on one of the chapters in How to Lie with Maps (5%), and the remaining 5% will come from your attendance and active participation in class activities.

Map Review: 5%

You will review one published map from a reputable news source in a five-minute presentation once during the quarter.

Practical Exercises: 45%

There will be six main practical exercises where you gain first-hand experience of data gathering in the field through observations, recording data, as well as using existing databases. As part of each practical exercise you will present your results in a written report where maps are often an integral component.

Exams: 40%

There will be one midterm exam and one final project, a term paper. The Term Paper is a major deliverable that helps you develop/demonstrate your understanding of basic methods of spatial data-gathering, presentation, and interpretation. It also asks you to demonstrate the value of geographic knowledge and how it can be used to analyze real-world, critical problems.

Final letter grades will be assigned based on how many percent of total points available you have earned.

92.5 <= A
90.0 <= A- < 92.5
87.5 <= B+ < 90.0
82.5 <= B < 87.5
80.0 <= B- < 82.5
77.5 <= C+ < 80.0
70.0 <= C < 77.5
60.0 <= D < 70.0
E < 60.0

Attendance, Timeliness & Examination Policy

All course work are expected by the due date. A late penalty of at least 10 percentage units will be taken off each day after the due date.

If you have a genuine reason (known medical condition, a pile-up of due assignments on other courses, ROTC, athletics teams, job interview, religious obligations etc.) for being unable to complete work on time, then some flexibility is possible. However, if in my judgment you could reasonably have let me know *beforehand* that there would likely be a delay, then a late penalty will still be imposed if I don't hear from you until *after* the deadline has passed. For unforeseeable problems, I can be more flexible. This applies to my ability to offer make-up exams as well.

If there are ongoing medical, personal, or other issues that are likely to affect your work all semester, then please arrange to see me to discuss the situation.

Most classes have time allotted for discussions, in-class work and other activities. Your contribution in these and in class generally, will be noted, and used to determine part of your final grade, just showing up is not enough! Obviously, you will receive no credit for in-class work if you are not present.

Academic Integrity Policy

You are welcome to discuss the assignments amongst yourselves, in fact this is encouraged, but the final product you hand in must be your own work.

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

What this really means is: If I suspect that a student has committed academic misconduct in this course, *I am obligated* by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. Please do not put yourself in that situation.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) can be found on the Committee on Academic Misconduct web pages (oaa.osu.edu/coam/home.html)

Disability Services

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.ohio-state.edu/.

Arts and Sciences Distance Learning Course Component Technical Review Checklist

Course: Geography 2200.02
Instructor: Ola Ahlqvist
Summary: Distance Hybrid/Distance Learning Course

Standard - Course Technology	Yes	Yes with Revisions	No	Feedback/ Recomm.
6.1 The tools used in the course support the learning objectives and competencies.	✓			The learning objectives and competencies are supported by the course tools used in the following ways. • Weekly readings • Online quizzes • Fieldwork assignments • Weekly lecture videos • Online and in-person labs • Map exercises • Topic based discussion posts • Topic based term paper
6.2 Course tools promote learner engagement and active learning.	✓			Students will use the following tools to engage with the course materials and instructor to promote active learning. • Carmen LMS • ArcGIS mapping software • Google Earth • GeoData research tool
6.3 Technologies required in the course are readily obtainable.	✓			All technologies being used for this course are readily obtainable through the Carmen LMS and/or a standard web browser. The “Necessary software” section of the syllabus provides the students the needed information to obtain all technologies required for the course.
6.4 The course technologies are current.	✓			All technologies being used for this course are current and accessible through the Carmen LMS and/or a standard web browser.
6.5 Links are provided to privacy policies for all external tools required in the course.	✓			Links have been provided in the “Necessary software” section of the syllabus to the privacy policies for the following external tools being used for this course. • ArcGIS • Google Earth • GeopData
Standard - Learner Support				

7.1 The course instructions articulate or link to a clear description of the technical support offered and how to access it.	✓			Recommend that links be provided in the “Course technology” section of the syllabus for the technical support offered for the following tools. If the instructor will be providing support for the tools this must be stated on the syllabus. • ArcGIS • Google Earth • GeopData
7.2 Course instructions articulate or link to the institution’s accessibility policies and services.	✓			a
7.3 Course instructions articulate or link to an explanation of how the institution’s academic support services and resources can help learners succeed in the course and how learners can obtain them.	✓			b
7.4 Course instructions articulate or link to an explanation of how the institution’s student services and resources can help learners succeed and how learners can obtain them.	✓			c
Standard – Accessibility and Usability				
8.1 Course navigation facilitates ease of use.	✓			Recommend using the Carmen Distance Learning “Master Course” template developed by ODEE and available in the Canvas Commons to provide student-users with a consistent user experience in terms of navigation and access to course content.
8.2 Information is provided about the accessibility of all technologies required in the course.	✓			Links have been provided in the “Necessary software” section of the syllabus to the accessibility statements for all third-party tools being used in this course.
8.3 The course provides alternative means of access to course materials in formats that meet the needs of diverse learners.	✓			Recommend that resources be developed to address any requests for alternative means of access to course materials. These resources should be in formats that meet the needs of diverse learners.
8.4 The course design facilitates readability	✓			Recommend using the Carmen Distance Learning “Master Course” template developed by ODEE and available in the Canvas Commons to provide student-users with a consistent user experience in terms of navigation and access to course content.
8.5 Course multimedia facilitate ease of use.	✓			All assignments and activities that use the Carmen LMS with embedded multimedia facilitates ease of use. All other multimedia resources facilitate ease of use by being available

				through a standard web browser.

Reviewer Information

- Date reviewed: 12/20/2016
- Reviewed by: Mike Kaylor

Notes

[a]The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know via email immediately so that we can privately discuss options. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information:slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue. **Consider putting text for the accessibility statement in BOLD 16 pt font.**

[b]Add to the syllabus this link with an overview and contact information for the student academic services offered on the OSU main campus. http://artsandsciences.osu.edu/about/college/contacts/advising

[c]Add to the syllabus this link with an overview and contact information for student services offered on the OSU main campus. http://ssc.osu.edu. Also, consider including this link in the "Other Course Policies" section of the syllabus.

Geography 2200.02 Credit-Hour Rationale

	Formalized instruction		Structured Educational Experiences	
Date	Time	Hours	Time	hours
Module 1	Online lectures	1	Online	2
Module 2	Online lectures	1	Online	2
Module 3	Online lectures	1	Online	2
(subtotals)		(3)		(6)
6/12			10-12:00	2
6/13	9-12:00	2.5	13-15:00	2
6/14	13-15:00	2	9-12:00	3
6/15	9-12:00	2.5	13-15:00	2
6/16			9-12:00	3
(subtotals)		(7.0)		(12)
6/19			8:00-18:00	5
6/20	9-12:00	2.5	13-15:00	2
6/21			8:00-18:00	5
6/22	9-12:00	2.5	13-15:00	2
6/23	9-12:00	2.5		
(subtotals)		(7.5)		(14)
Module 9	Online lectures	1	Online	2
Module 10	Online lectures	1	Online	2
Module 11			Online	1
(subtotals)		(2)		(5)
totals		**19.5**		**37**

Allocation

The proposed syllabus contains approximately 14.5 hours of regular formalized instruction and approximately 26 hours of structured educational experiences in the form of computer labs that require an average of one hour of out-of-class study per lab hour preparing and following-up on the lab experience. These all take place during the in-country study abroad portion of the course.

Another 5 hours of regular formalized instruction and 11 hours of structured educational activities (again requiring an average of one hour of offline preparing and following-up on the online activities) are done as part of the

distance learning online course components. The estimated times for these activities are based on student feedback from the existing online course Geography 2750 which is used as the template for the online modules in this course.

Altogether, 19 hours of formalized instruction, in addition to approximately 37 hours of structured educational experiences. Per the Arts & Sciences Curriculum guidelines equating 12 ½ hours of formalized instruction and/or 25 hours of structured educational experiences per credit hour (or 37 ½ hours of formalized instruction per 3 credit hour course), we propose that Geography 2200.02 maintains 3 total credit hours in the new hybrid online/education abroad offering.

GEOGRAPHY 2200.02: MAPPING OUR WORLD - Southern Scandinavia Education Abroad

Explanation of how GE expected learning outcomes are addressed

The Distance Learning/Education Abroad version of this existing course maintains the same course goals as our current in-class offering, with the addition of one ELO related to the education abroad component (#6).

By the end of this course, students should successfully be able to:

1. employ basic methods of spatial data-gathering, presentation, and interpretation
2. interpret map symbology in order to analyze and critically evaluate the spatial structure of and relationships among spatial phenomena
3. demonstrate familiarity with some basic concepts of descriptive and inferential statistics in order to understand some unique properties of spatial statistics
4. apply statistical ideas to seek explanations for unusual or interesting patterns on maps
5. evaluate the impact of spatial data sampling, uncertainty and scale on map use
6. demonstrate a basic familiarity with Sweden/Scandinavia and articulate how their time abroad has enriched their academic experience

According to the Arts and Sciences Curriculum and Assessment Operations Manual 2015-16, the overarching goal for the Data Analysis GE category is that "*Students develop skills in drawing conclusions and critically evaluating results based on data.*"(GE goal)

This goal is further specified in three expected learning outcomes:

> *"Students understand basic concepts of statistics and probability (ELO1), comprehend methods needed to analyze and critically evaluate statistical arguments (ELO2), and recognize the importance of statistical ideas (ELO3)."*

In line with the intent of this category, Geography 2200 addresses this by exposing students to the problems of data gathering, storage, manipulation, analysis, presentation, and interpretation of geographic data, specifically as it relates to mapping. This course not only emphasizes geographical science but also embraces other disciplines that require the analysis of spatial data (including, but not limited to, geology, political science, criminology, philosophy, biology, anthropology, business, law, history, and environmental science). Thus, the course will bridge between qualitative social science and quantitative natural science data analysis and reasoning while connecting fundamental concepts and theory to real-world experiences and scenarios.

1. How does Geography 2200 course objectives address the GE learning outcomes above?

Students will actively engage in how to examine, analyze and explain natural and social phenomena through maps and other statistical graphics aided by geospatial technologies such

as virtual globes, geographic information systems, and location aware devices (GPS, smart phones, etc.)

Descriptive statistics, such as measurement scale, measures of dispersion and central tendency, are fundamental to the proper use of maps, and will be treated by careful examination of various spatial data displays. Students will be exposed to numerical attribute summaries, tables and graphical summaries in maps and charts to become well versed in numerical and graphical arguments, and subsequently students will explore correlations between spatial attributes. Here, multiple and multi-variate thematic maps as statistical surfaces will serve as a theoretical foundation for discussions on the uses vs. misuses of statistics and quantitative vs. qualitative arguments.

Through readings and practical exercises the students will learn about fundamental issues related to the acquisition, manipulation, analysis, display, and interpretation of spatially referenced data.

Data gathering exercises range from primary field observations to secondary use of existing data bases where students will develop a contextualized understanding of problems related to the measurement of space, spatial observations and gathering of data as attributes of space. Key ideas such as sampling, measurement, central tendency, axioms of probability, probability calculations, and statistical inference are naturally integrated with the mapping of summary demographics, spatial hot-spots, and interpolation of data from weather stations. Here, students will become aware of the problematic nature of spatial data for statistical analysis. Specifically, the Modifiable Areal Unit Problem (MAUP) and spatial autocorrelation will allow students to realize the particular challenges of employing correlation and regression analyses on spatial data sets and maps.

Through a series of thematic application areas – history, biogeography, climate, population, politics, economy, and weather – students will recognize and gain a hands-on understanding of the impact of basic statistical ideas in contexts that are relevant to daily life and specific areas of study. The use of geographic information systems software in computer exercises present students with opportunities to apply concepts they learn in class to practical problems of data analysis. As such it provides students with the necessary foundation for interpreting maps, geovisual displays, and to recognize the importance of spatial statistical thinking in the natural, social, and behavioral sciences.

2. How do the readings assigned in Geography 2200 address the GE Expected Learning Outcomes above?

The text book for this course – by Kimerling, Buckley, Muehrcke and Muehrcke – is now in it's 8th edition and is written as a thorough introduction to map use and spatial understanding of the world. In two sections it covers the basics of “Map reading” – the map maker's process from reality to symbolic representation – and the reverse process “Map analysis”– the extraction of information from the map. In its latest edition (2016) it provides up-to-date coverage, and places maps in the context of other representational systems such as natural language, mathematics, and art. It also recognizes and allows for a critical examination of the

current shift from authoritative, government-agency-produced maps to commercially or crowd-sourced map products. As such, the book provides a solid foundation for understanding the particular problems related to geographic data gathering, storage, manipulation, and interpretation of the natural and human landscape. The large map analysis section provides dedicated chapters on methods and examples of area and volume measures, surface analysis, spatial patterns, and spatial associations. Those sections use foundations from the first part of the book to bear on inferential statistical techniques important to spatial data analysis, mainly, how probability concepts can be used to determine accuracy of GPS readings, autocorrelation and clustering of point patterns.

The book is designed primarily for college-level students that seek to unlock the codes used by map makers to visually represent quantitative and qualitative information about the world. The companion web-site also has chapter-specific resources and student exercises for those students who seek to enrich their learning beyond the structured course activities.

3. How do the topics covered in Geography 2200 address the GE Expected Learning Outcomes above?

The course is centered on problems related to data-gathering, presentation and interpretation of data. Students will have multiple practical exercises where they gain first-hand experience of data gathering in the field through observations, recording data, as well as using existing databases. As part of these practical exercises they will present their results in written reports where maps are an integral component. The practical exercises are also designed to give students significant practice in map data interpretation and analysis. Several shorter in-class exercises also help reinforce the concepts covered by the lectures.

Maps are mostly about descriptive statistics and therefore deal most commonly with data summaries in the form of average, median, standard deviation and quantiles. Many of the worst examples of 'how to lie with maps' are related to the use of inappropriate map types for particular types of data. Therefore the course will thoroughly examine the do's and don'ts of statistical mapping. In addition, a significant portion of the course is devoted to map analysis, e.g. spatial arrangement and association, and therefore involve concepts of spatial correlation, expected vs. predicted frequencies, probability and cluster detection through statistical inference. While many details and complexities of these topics are beyond the scope of this course, the maps that students confront will naturally reveal the importance of a deeper assessment than just judging a map by the looks of it.

In most of the practical exercises students will use geographic information system software to perform basic computational analysis and statistical map design. By using computers and mathematical algorithms, students learn both the concepts of spatial reasoning and the techniques of quantitative geocomputation. For example, students can utilize online mapping tools to explore how weather observations at point locations are transformed into a statistical surface through various interpolation algorithms, and asses the accuracy of derived estimates.

4. How do the written assignments completed in Geography 2200 address the GE Expected Learning Outcomes above?

In nine of the eleven course modules, students work on one or more practical assignments that requires a written report. The practical exercises progressively build skills in how to collect, enter, analyze, and visualize spatial data.

The annotated schedule below specifies how instructional hours are spent on the "Core" and "Additional" requirements of the data analysis GE category. Labels C1, C2, A1 and A2 refers specifically to:

C1 (5.5 hours) - Notions of probability. The axioms of probability, and basic probability calculations. Random variables, and probability calculations using random variables. Expected values.

C2 (5 hours) - Basics of statistical inference. Moving from a sample to a population. Bias and variance. Understanding the margin of error and confidence. The logic of statistical testing. The misuse of statistics.

A1 (4 hours) - Understanding where data come from. Data sources. Discriminating between observational and experimental studies. (Random) sampling.

A2 (4.5 hours) - Summarizing data graphically and numerically. Discriminating between good and bad summaries. Understanding the advantages and disadvantages of a given summary.

Course Modules	Activities	Due date	% of grade (roughly)	Online (O)/ in-country (I)
1. Course welcome & logistics	▪ Lecture video – course introduction ▪ Getting acquainted survey - you tell us a bit about yourself in a Carmen survey ▪ Getting acquainted video response - you record a video of yourself ▪ Getting to know your peers - you copy some of your survey responses to a small group discussion as an introduction to some of the other students ▪ Lecture video – syllabus review w. quiz ▪ Intro to ArcGIS online (AGOL) activity - get to know the main course technology ▪ End of module quiz on the Syllabus and course policies	**June 2**	**6**	**Online**

2. Why is spatial special? Introduction to geographic information, map types, and projections	▪ Reading Chapters 1-3 ▪ The power of geographic information? - watch a video about geographic data analysis and respond to a few questions ▪ Lecture video – Spatial is Special ▪ Map examples exercise ▪ Lecture video – Map coordinates and projections ▪ Measure your Lat./Long. Position in the U.S activity	**June 2**	**6**	**Online**
3. Visual variables, remote sensing and image maps	▪ Reading Chapters 7-8 ▪ Lecture video – Measurements, data types, types of statistics (A1=0.5 hour, C1=0.5 hour) ▪ Identifying data types on maps activity w. quiz (A1=0.5 hour) ▪ Lecture video – Qualitative and quantitative visual variables (A2=0.5 hour) ▪ Qualitative and quantitative maps activity w. quiz (A2=0.5 hour, C1=0.5 hour)	**June 2**	**6**	**Online**
4. Orientation to Lund and Sweden **Spatial observations**	▪ Module 1-2 review ▪ Field work – Measure your Lat./Long. position in Sweden activity (C2=0.5 hour) ▪ Lecture – Spatial observations (A1=1 hour) ▪ Field work – Spatial observations in city of Lund (A1=1 hour, C1=0.5 hour) ▪ Observations write-up – Carmen submission ▪ Readings – Meinig (1979) 10 Landscape views	**June 14**	**11**	**In-country**
5. Field work essentials **Data types and map design**	▪ Module 3-4 review ▪ Field work – Structured data recording and mapping collection in the field, city of Lund (A1=1 hour) ▪ Lecture - Map design (C2=0.5, A2=1 hour) ▪ Lab – Data entry and map design activity (A2=1 hour) ▪ Readings – Chapter 6		**13**	**In-country**
6. Hot and cold: weather patterns and what makes a climate	▪ Module 5 review ▪ Lecture - Climate data, Isoline maps, intro to autocorrelation (C1=0.5 hour) ▪ Field work – Excursion NW Scania ▪ Lecture – interpolation, inferential statistics (C2=0.5 hour)		**13**	**In-country**

Isoline maps Autocorrelation - Interpolation	▪ Lab – Data entry, interpolation, mapping (C1=1, C2=0.5 hour) ▪ Readings – Chapter 9 & 16			
7. Remote sensing and Image maps **Introduction to final assignments and term paper**	▪ Module 6 review ▪ Lecture – generalization and map uncertainty ▪ Field work – Excursion SE Scania ▪ Lecture – image maps, land cover, map accuracy (C2=0.5 hour) ▪ Lab – Map accuracy, error measures (C2=1 hour) ▪ Readings – Chapter 10 & 11		**15**	**In-country**
8.	▪ Module 7 review ▪ Lecture – overview of modules 9-10 and final paper ▪ Term paper proposals	**June 23**	**3**	**In-country**
9. The wealth of nations and their connections **Multi-variate data and visualization**	▪ Intro to GeoDa activity w. quiz ▪ Lecture - Multi-variate data and visualization (C1=0.5, A2=0.5 hour) ▪ Lab – Multivariate Spatial data exploration and autocorrelation (C1=0.5, C2=0.5, A2=1 hour) ▪ Readings – Chapter 18 ▪ Online quiz		**6**	**Online**
10. Spatial pattern analysis **Spatial association analysis**	▪ Video Lecture - Intro to point patterns (C1=0.5, C2=0.5 hour) ▪ Lab – Spatial pattern analysis (C1=1, C2=1 hour) ▪ Readings – Chapter 17 ▪ Online quiz		**6**	**Online**
11. Term paper	▪ Term paper submission ▪ Recording a slide presentation with audio narration ▪ Discussion forum on presentations		**15**	**Online**

The following table outlines the alignment of GE ELOs with key assignments.

GE ELO	Module
(ELO1) “Students understand basic concepts of statistics and probability”	3, 4, 5, 6, 7, 9, 10, Term Paper

(ELO2) “comprehend methods needed to analyze and critically evaluate statistical arguments”	4, 5, 6, 9, Term Paper
(ELO3) “recognize the importance of statistical ideas”	2, 6, 7, 9, 10, Term Paper

GEOG 2200.02 Course Assessment Plan

Similar to the currently offered version of this course, Geography 2200.02 will assess the GE ELOs through the use of a rubric to in the term paper assignment. This is an end-of-course term paper that offers the opportunity to do a final assessment of learning outcomes. The term paper assignment asks each student to present an argument and justification using maps and geographic data in an area they are interested in (e.g. international relations, politics, biodiversity, crime prevention, social networks). A central section of the report is to provide a description of how the geographic situation or phenomenon has been conceptualized, a data description (using appropriate terminology), and a discussion of how any data analysis support their argument.

GE Expected Learning Outcomes	**Methods of Assessment**	**Level of student achievement expected for the GE ELO**	**Process used to review the data and make improvements wrt. ELOs**
ELO1 – Students understand basic concepts of statistics and probability	End-of-course term paper	At least 95% of students perform at or above benchmark level 2 (Developing) on rubric criteria #4, 6 & 7 (see below)	For the GE assessment we summarize on each rubric criteria the number of students performing at each benchmark level (1=Beginning, 2=Developing, 3=Accomplished, 4=Exemplary). This provides a summative picture of how well the students reach the ELOs, and indications if there are particular areas than need added attention to raise student performance to the desired levels.
ELO2 – Students comprehend methods needed to analyze and critically evaluate statistical arguments	End-of-course term paper	At least 95% of students perform at or above benchmark level 2 (Developing) on rubric criteria #2 & 3 (see below)	
ELO3 – Students recognize the importance of statistical ideas	End-of-course term paper	At least 95% of students perform at or above benchmark level 2 (Developing) on rubric criteria #1 & 5 (see below)	

The grading rubric below describes the four benchmark student learning outcomes for each criteria, and shows how rubric criteria map onto the GE ELOs listed above. Using this rubric, we score students' end-of-course term papers on each rubric item.

	4=Exemplary	3=Accomplished	2=Developing	1=Beginning
1. Organization and Coherence Max 4 points (GE ELO #3)	Uses a logical structure appropriate to subject. Guides the reader through the chain of reasoning. 4p.	Shows a logical progression of ideas. Some logical links may be unclear. 3-3.5p.	May list or arrange ideas randomly. Logic is not always clear. 2-2.5p.	May have random organization, lacking internal paragraph coherence. 1-1.5p.
2. Method comprehension Max 8 points (GE ELO #2)	Clear and exemplary understanding of basic methods for spatial data gathering, presentation, and interpretation. 8p.	Accomplished but basic understanding of basic methods for spatial data gathering, presentation, and interpretation. 6-7p.	Developing but limited understanding of basic methods for spatial data gathering, presentation, and interpretation. 4-5p.	Lacking or beginning understanding of basic methods for spatial data gathering, presentation, and interpretation. 1-3p.
3. Data analysis Max 8 points (GE ELO #2)	Clear and exemplary analysis and critical evaluation of the spatial structure and/or relationships among spatial phenomena 8p.	Accomplished but basic analysis and critical evaluation of the spatial structure and/or relationships among spatial phenomena. 6-7p.	Developing but limited analysis and critical evaluation of the spatial structure and/or relationships among spatial phenomena. 4-5p.	Lacking or beginning analysis and critical evaluation of the spatial structure and/or relationships among spatial phenomena. 1-3p.
4. Statistical concepts Max 4 points (GE ELO #1)	Clear and exemplary understanding of basic descriptive and/or inferential statistical concepts in a spatial data context. 4p.	Accomplished but basic understanding of basic descriptive and/or inferential statistical concepts in a spatial data context. 3-3.5p.	Developing but limited understanding of basic descriptive and/or inferential statistical concepts in a spatial data context. 2-2.5p.	Lacking or beginning understanding of basic descriptive and/or inferential statistical concepts in a spatial data context. 1-1.5p.
5. Support for conclusions Max 8 points (GE ELO #3)	Uses evidence appropriately and effectively, providing sufficient evidence and explanation to convince. 8p.	Begins to offer reasons to support points. Begins to interpret the evidence and explain connections between evidence and main ideas. 6-7p.	Often uses generalizations to support points. May use obvious or irrelevant examples, assumes that evidence speaks for itself, or has lapses in logic. 4-5p.	Depends on overgeneralizations for support, or offers little evidence of any kind. More personal narrative than essay, or summary rather than analysis.1-3p.
6. Sampling and uncertainty Max 8 points (GE ELO #1)	Demonstrates exemplary understanding of how sampling and uncertainty affect integrity of the information. 8p.	Accomplished but basic understanding of how data integrity is affected by sampling and uncertainty. 6-7p.	Developing but limited understanding of how data integrity is affected by sampling and uncertainty. 4-5p.	Paper is lacking in description of sampling and uncertainty, or the description is unclear. 1-3p.
7. Terminology Max 6 points (GE ELO #1)	Chooses words for their precise meaning and uses an appropriate level of specificity. 6p.	Generally uses words accurately and effectively, occasional use of incorrect terms. 4.5-5.5p.	Uses relatively vague and general words, include some incorrect terminology. 2.5-4p.	May be too vague and abstract, or too personal and specific, or incorrect. 1-2p.
8. Mechanics (Max 4 points)	Almost entirely free of spelling, punctuation, and grammatical errors. 4p.	May contain a few errors, which may annoy the reader but not impede understanding. 3-3.5p.	Contains several mechanical errors, which may temporarily confuse the reader but not impede the overall understanding. 2-2.5p.	Plenty of spelling, punctuation, and grammatical errors that hamper the reader's understanding. 1-1.5p.

Records of the term paper assessment will be maintained on file in the department so that the progress of the course can be monitored and evaluated across time as the course evolves and to enable the department to address any major concerns or drift from the established goals and standards.

One prior offering of this course (SP15, see graphic below) revealed that in general, all students reached above the “Beginning” level and most students also performed above the “Developing” benchmark level. The biggest area of concern was the “statistical concepts” criteria where most

students only reached the “Developing” benchmark. In this revised syllabus we have adjusted the material to spend more time on Core content C1 and C2 (see above) and we will closely monitor the outcomes for indicators of improvements.

	GE ELO	Rubric Criteria		Frequency
⊟	#1	4. Statistical concepts (4 points)		
		Level 4	5 %	
		Level 3	34 %	
		Level 2	61 %	
		Level 1	0 %	
⊟	#1	6. Sampling and uncertainty (8 points)		
		Level 4	10 %	
		Level 3	66 %	
		Level 2	22 %	
		Level 1	2 %	
⊟	#1	7. Terminology (6 points)		
		Level 4	71 %	
		Level 3	29 %	
		Level 2	0 %	
		Level 1	0 %	
⊟	#2	2. Method comprehension (8 points)		
		Level 4	10 %	
		Level 3	78 %	
		Level 2	12 %	
		Level 1	0 %	
⊟	#2	3. Data analysis (8 points)		
		Level 4	12 %	
		Level 3	63 %	
		Level 2	24 %	
		Level 1	0 %	
⊟	#3	1. Organization and Coherence (4 points)		
		Level 4	54 %	
		Level 3	44 %	
		Level 2	2 %	
		Level 1	0 %	
⊟	#3	5. Support for conclusions (8 points)		
		Level 4	17 %	
		Level 3	73 %	
		Level 2	10 %	
		Level 1	0 %	

GEOG 2200.01 Course Assessment Plan

Similar to the currently offered version of this course, Geography 2200.01 will assess the GE ELOs through the use of a rubric to in the term paper assignment. This is an end-of-course term paper that offers the opportunity to do a final assessment of learning outcomes. The term paper assignment asks each student to present an argument and justification using maps and geographic data in an area they are interested in (e.g. international relations, politics, biodiversity, crime prevention, social networks). A central section of the report is to provide a description of how the geographic situation or phenomenon has been conceptualized, a data description (using appropriate terminology), and a discussion of how any data analysis support their argument.

GE Expected Learning Outcomes	**Methods of Assessment**	**Level of student achievement expected for the GE ELO**	**Process used to review the data and make improvements wrt. ELOs**
ELO1 – Students understand basic concepts of statistics and probability	End-of-course term paper	At least 95% of students perform at or above benchmark level 2 (Developing) on rubric criteria #4, 6 & 7 (see below)	For the GE assessment we summarize on each rubric criteria the number of students performing at each benchmark level (1=Beginning, 2=Developing, 3=Accomplished, 4=Exemplary). This provides a summative picture of how well the students reach the ELOs, and indications if there are particular areas than need added attention to raise student performance to the desired levels.
ELO2 – Students comprehend methods needed to analyze and critically evaluate statistical arguments	End-of-course term paper	At least 95% of students perform at or above benchmark level 2 (Developing) on rubric criteria #2 & 3 (see below)	
ELO3 – Students recognize the importance of statistical ideas	End-of-course term paper	At least 95% of students perform at or above benchmark level 2 (Developing) on rubric criteria #1 & 5 (see below)	

The grading rubric below describes the four benchmark student learning outcomes for each criteria, and shows how rubric criteria map onto the GE ELOs listed above. Using this rubric, we score students' end-of-course term papers on each rubric item.

	4=Exemplary	3=Accomplished	2=Developing	1=Beginning
1. Organization and Coherence Max 4 points (GE ELO #3)	Uses a logical structure appropriate to subject. Guides the reader through the chain of reasoning. 4p.	Shows a logical progression of ideas. Some logical links may be unclear. 3-3.5p.	May list or arrange ideas randomly. Logic is not always clear. 2-2.5p.	May have random organization, lacking internal paragraph coherence. 1-1.5p.
2. Method comprehension Max 8 points (GE ELO #2)	Clear and exemplary understanding of basic methods for spatial data gathering, presentation, and interpretation. 8p.	Accomplished but basic understanding of basic methods for spatial data gathering, presentation, and interpretation. 6-7p.	Developing but limited understanding of basic methods for spatial data gathering, presentation, and interpretation. 4-5p.	Lacking or beginning understanding of basic methods for spatial data gathering, presentation, and interpretation. 1-3p.
3. Data analysis Max 8 points (GE ELO #2)	Clear and exemplary analysis and critical evaluation of the spatial structure and/or relationships among spatial phenomena 8p.	Accomplished but basic analysis and critical evaluation of the spatial structure and/or relationships among spatial phenomena. 6-7p.	Developing but limited analysis and critical evaluation of the spatial structure and/or relationships among spatial phenomena. 4-5p.	Lacking or beginning analysis and critical evaluation of the spatial structure and/or relationships among spatial phenomena. 1-3p.
4. Statistical concepts Max 4 points (GE ELO #1)	Clear and exemplary understanding of basic descriptive and/or inferential statistical concepts in a spatial data context. 4p.	Accomplished but basic understanding of basic descriptive and/or inferential statistical concepts in a spatial data context. 3-3.5p.	Developing but limited understanding of basic descriptive and/or inferential statistical concepts in a spatial data context. 2-2.5p.	Lacking or beginning understanding of basic descriptive and/or inferential statistical concepts in a spatial data context. 1-1.5p.
5. Support for conclusions Max 8 points (GE ELO #3)	Uses evidence appropriately and effectively, providing sufficient evidence and explanation to convince. 8p.	Begins to offer reasons to support points. Begins to interpret the evidence and explain connections between evidence and main ideas. 6-7p.	Often uses generalizations to support points. May use obvious or irrelevant examples, assumes that evidence speaks for itself, or has lapses in logic. 4-5p.	Depends on overgeneralizations for support, or offers little evidence of any kind. More personal narrative than essay, or summary rather than analysis.1-3p.
6. Sampling and uncertainty Max 8 points (GE ELO #1)	Demonstrates exemplary understanding of how sampling and uncertainty affect integrity of the information. 8p.	Accomplished but basic understanding of how data integrity is affected by sampling and uncertainty. 6-7p.	Developing but limited understanding of how data integrity is affected by sampling and uncertainty. 4-5p.	Paper is lacking in description of sampling and uncertainty, or the description is unclear. 1-3p.
7. Terminology Max 6 points (GE ELO #1)	Chooses words for their precise meaning and uses an appropriate level of specificity. 6p.	Generally uses words accurately and effectively, occasional use of incorrect terms. 4.5-5.5p.	Uses relatively vague and general words, include some incorrect terminology. 2.5-4p.	May be too vague and abstract, or too personal and specific, or incorrect. 1-2p.
8. Mechanics (Max 4 points)	Almost entirely free of spelling, punctuation, and grammatical errors. 4p.	May contain a few errors, which may annoy the reader but not impede understanding. 3-3.5p.	Contains several mechanical errors, which may temporarily confuse the reader but not impede the overall understanding. 2-2.5p.	Plenty of spelling, punctuation, and grammatical errors that hamper the reader's understanding. 1-1.5p.

Records of the term paper assessment will be maintained on file in the department so that the progress of the course can be monitored and evaluated across time as the course evolves and to enable the department to address any major concerns or drift from the established goals and standards.

One prior offering of this course (SP15, see graphic below) revealed that in general, all students reached above the “Beginning” level and most students also performed above the “Developing” benchmark level. The biggest area of concern was the “statistical concepts” criteria where most

students only reached the “Developing” benchmark. In this revised syllabus we have adjusted the material to spend more time on Core content C1 and C2 (see above) and we will closely monitor the outcomes for indicators of improvements.

	GE ELO	Rubric Criteria		Frequency
⊟	#1	4. Statistical concepts (4 points)		
		Level 4	5 %	
		Level 3	34 %	
		Level 2	61 %	
		Level 1	0 %	
⊟	#1	6. Sampling and uncertainty (8 points)		
		Level 4	10 %	
		Level 3	66 %	
		Level 2	22 %	
		Level 1	2 %	
⊟	#1	7. Terminology (6 points)		
		Level 4	71 %	
		Level 3	29 %	
		Level 2	0 %	
		Level 1	0 %	
⊟	#2	2. Method comprehension (8 points)		
		Level 4	10 %	
		Level 3	78 %	
		Level 2	12 %	
		Level 1	0 %	
⊟	#2	3. Data analysis (8 points)		
		Level 4	12 %	
		Level 3	63 %	
		Level 2	24 %	
		Level 1	0 %	
⊟	#3	1. Organization and Coherence (4 points)		
		Level 4	54 %	
		Level 3	44 %	
		Level 2	2 %	
		Level 1	0 %	
⊟	#3	5. Support for conclusions (8 points)		
		Level 4	17 %	
		Level 3	73 %	
		Level 2	10 %	
		Level 1	0 %	