Term Information

Effective Term	Spring 2014
Previous Value	*Summer 2012*

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Adding GE status, in Data Analysis category

What is the rationale for the proposed change(s)?

Geography 2200 addresses the data analysis ELOs by exposing students to the problems of gathering, storage, manipulation, analysis, presentation, and interpretation of geographic data, specifically as it relates to mapping.

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the requrest contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

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
Course Title	Mapping Our World
Transcript Abbreviation	Mapping Our World
Course Description	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	14 Week, 7 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus, Lima, Mansfield, Marion, Newark

Prerequisites and Exclusions

Prerequisites/Corequisites	
Exclusions	Not open to students with credit for 480.

Cross-Listings

Cross-Listings

Subject/CIP Code

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

Quarters to Semesters

Quarters to Semesters	Semester equivalent of a quarter course (e.g., a 5 credit hour course under quarters which becomes a 3 credit hour course under semesters)
List the number and title of current course being converted	480 Map Reading and Interpretation

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

Previous Value

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

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

Previous Value

- *Introduction to geographic information*
- *The mapping process*
- *Mapping the ages*
- *Mapping physical processes*
- *Mapping social processes*
- *Atlases*
- *Wiki cartography*

Attachments

- Geog-2200-GEC-proposal-02.doc: GE statement, assessment, and syllabus

(GEC Model Curriculum Compliance Stmt. Owner: Mansfield,Becky Kate)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Mansfield,Becky Kate	03/26/2013 10:57 AM	Submitted for Approval
Approved	Mansfield,Becky Kate	03/26/2013 10:58 AM	Unit Approval
Approved	Haddad,Deborah Moore	03/26/2013 12:20 PM	College Approval
Pending Approval	Nolen,Dawn Jenkins,Mary Ellen Bigler Vankeerbergen,Bernadette Chantal Hogle,Danielle Nicole Hanlin,Deborah Kay	03/26/2013 12:20 PM	ASCCAO Approval

GEOGRAPHY 2200: MAPPING OUR WORLD

Adherence to Data Analysis General Education Expected Learning Outcomes

According to the 2012 Revised GE Goals & Expected Learning Outcomes, approved 6/8/2012, the expected learning outcomes for "Data Analysis" are:

> *"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."*

In line with the intent of this category, Geography 2200 will address this by exposing students to the problems of gathering, storage, manipulation, analysis, presentation, and interpretation of geographic data, specifically as it relates to mapping. The main goal is to equip students with 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 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 and 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 and uncertainty on map use

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 and quantitative 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?

The overarching goal of this course is to promote spatial data literacy. The course approaches this through a critical examination of maps as one of society's most sophisticated conceptual creations, serving increasingly many interests in modern society, seemingly intuitive, yet fraught with issues related to abstraction, data collection, sampling, classification, processing, and symbolization. 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 labs 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, and probability 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 why simple correlation and regression are particularly challenging to employ on spatial data sets and maps.

Through 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 contexts that are relevant to daily life and specific areas of study. The use of geographic information systems software in laboratory 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 7th 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 it's latest edition (2011) 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.

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.

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

The course is centered around problems related to data-gathering, presentation and interpretation of data. Students will have weekly labs 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 labs they will present their results in written reports where maps are an integral component. The labs 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.

Significant class time is devoted to map presentations where students learn to critically examine how maps are used in media (newspaper, internet, TV) reports to inform about current events. These presentations help to get students exposed to many different types of maps on a variety of subjects and they connect class material to relevant, real-world examples that makes for a more engaging and personalized learning experience.

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, and cluster detection. 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 laboratory 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 the socioeconomic impact of recurring wildfires, calculate the size of the impact area, and contrast these with socio-economic data on e.g population and transportation through basic map algebra operations such as intersection, union, and spatial summary operations.

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

Each week students work on a lab assignment that requires a written lab report. The labs progressively build skills in how to collect, enter, analyze, and visualize spatial data.

The following table outlines the alignment of course objectives and GE ELOs with Homework assignments. While most assignments align to some extent with most of the course objectives and ELOs, the table focus on the most substantial alignments.

Course objective	GE ELO	Homework Assignment
employ basic methods of spatial data-gathering, presentation, and interpretation	"comprehend methods needed to analyze and critically evaluate statistical arguments"	HA 1, HA 2, HA 3
interpret map symbology in order to analyze and critically evaluate the spatial structure of and relationships among spatial phenomena	"comprehend methods needed to analyze and critically evaluate statistical arguments"	HA 3, HA 5, HA 6, HA 7
demonstrate familiarity with some basic concepts of descriptive and inferential statistics and understand some unique properties of spatial statistics	"Students understand basic concepts of statistics and probability"	HA 2, HA 3, HA 4, HA 6
apply statistical ideas to seek explanations for unusual or interesting patterns on maps	"Students develop skills in drawing conclusions and critically evaluating results based on data."	HA 6, HA 7
evaluate the impact of spatial data sampling and uncertainty on map use	"recognize the importance of statistical ideas"	HA 3, HA 4, HA 6, HA 7

GEOG 2200 Course Assessment Plan

As developed in consultation with the Undergraduate Studies Committee in the Department of Geography, Geography 2200 will be reviewed and assessed through the following mechanisms:

1. Quantitative student SEI evaluation
2. Embedded testing in both the midterm and final exams
3. Embedded testing in Homework Assignment 7

Item 2 will consist of standardized questions on the midterm and final exams which will allow for comparisons in GE learning outcomes listed above.

Item 3 is an end-of-course assignment that offers the opportunity to do a final assessment of learning outcomes. The final report template 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.

Items 1-3 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. The embedded questions will be critically reviewed by the Undergraduate Studies Committee every third time the course is taught.

This review will provide an assessment of how well the GE goals of the course are being met through time, and if the results are consistent independent of specific instructors. If the results suggest that the GE learning objectives are not being clearly communicated through course content, the instructor will undertake substantial revision of readings, lecture content, and discussion in class. If the data primarily indicate neutrality or that GE material is being adequately covered in class, the instructor will still make minor adjustments to readings and lecture content.

Geography 2200
Mapping our World

Spring 2012
3 credit (semester) hours

Time: TBD
Location: Derby Hall 0140

Instructor: TBD

Office phone: xxx-xxxx

Office address: xxxx Derby Hall, 154 N Oval Mall

Office hours: TBD

GTA: TBD

Office phone: xxx-xxxx

Office address: xxxx Derby Hall, 154 N Oval Mall

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 is 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, laboratory 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 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
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- apply statistical ideas to seek explanations for unusual or interesting patterns on maps
- evaluate the impact of spatial data sampling and uncertainty 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.

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 quarter.

Additional required readings will be provided in Carmen

Schedule

Week #	Topic	Homework Assignment (HA)
1	Why is spatial special? Introduction to geographic information	1. Spatial observations
2	Spatial observations	
3	Visual Variables	2. Drawing a map
4	Map coordinates and projections	
5	Hot and cold: weather patterns and what makes a climate	3. Isoline climate maps
6	Isoline maps and analysis	
7	Crossing the line: the nature and significance of political boundaries	4. Map accuracy and uncertainty
8	Remote sensing and image maps	
9	Where's Wall Street? The wealth of nations and their connections	5. Multivariate data & exploratory map analysis
10	Multi-variate data and visualization	
11	Spatial pattern analysis	6. Spatial pattern analysis

12	Spatial association analysis	
13	Volunteered geographic information and the new Wiki cartography	7. Individual project
14	What can maps do for us? Personally selected topic related to the course material	
15	What can maps do for us? Cont.	

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

Lectures

xxxdays and yyydays hh:mm — hh:mm in [location].

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 it also relies heavily on your active participation. There will also be seven homework assignments that 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.

Map Review: 5%

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

Homework Assignments: 50%

There will be seven assignments, one of which will be a longer 3-5-page report on a subject of your choice.

Exams: 35%

There will be one midterm and one final exam.

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
F < 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/**.**