University of Wisconsin-Whitewater

Curriculum Proposal Form #4A

# **Change in an Existing Course**

Type of Action (check all that apply)

Course Revision (*include course description & former and new syllabus)*  Grade Basis

Contact Hour Change and or Credit Change  Repeatability Change

Diversity Option  Other:

General Education Option

area:  **\***

\* Note: For the Gen Ed option, the proposal should address how this course relates to specific core courses, meets the goals of General Education in providing breadth, and incorporates scholarship in the appropriate field relating to women and gender.

**Effective Term**:

**Current Course Number** (*subject area and 3-digit course number*): GEOG290

**Current Course Title**: Spatial Analysis

**Sponsor(s)**: Eric Compas

**Department(s):** Geography & Geology

**College(s):**

**List all programs that are affected by this change:**

**Geography Major - Techniques Track**

If programs are listed above, will this change affect the Catalog and Advising Reports for those programs? If so, have Form 2's been submitted for each of those programs?

(Form 2 is necessary to provide updates to the Catalog and Advising Reports)

NA  Yes  They will be submitted in the future

Proposal Information: ([***Procedures for form #4A***](http://www.uww.edu/acadaff/ucc/Procedures_form4A.docx))

1. **Detailed explanation of changes** (use FROM/TO format)

***FROM:***

GEOG290 SPATIAL ANALYSIS, PREREQ: MATH 143

***TO:***

GEOG290 SPATIAL ANALYSIS, [NO PREREQ LISTED]

## Justification for action

The prerequisite was required for the course when taught by an earlier instructor. The current instructor and syllabus do not require any math prerequisite.

1. **Syllabus/outline** (if course revision, include former syllabus and new syllabus)

The previous instructor’s syllabus is not available (last taught in 2004?).

Current syllabus:

# GEOG290 - Spatial analysis

**BE GREEN - Don't print; read this on the screen**

|  |  |
| --- | --- |
| **Instructor/guide:** | Eric Compas, Upham 112, 262-472-5126, [compase@uww.edu](mailto:compase@uww.edu) |
| **Office hours:** | M 11am-noon & MW 3:30-4:20pm |
| **Textbook:** | McGrew, J.C. and Monroe, C.B. 2000. *An introduction to statistical problem solving in geography*. 2nd ed. McGraw Hill: Boston |
| **Section:** | MW 2:15-3:30pm (M Upham 106, W Upham 100) |

Additional information and resources on course's D2L site.

## Course description

The goal of this course is to torture students with complex, esoteric statistical procedures...uh, no, I mean...learn basic and important statistical skills and software relevant to geographers. The focus of this class is to develop skills in three main areas: descriptive statistics for spatial and non-spatial data, inferential statistics and hypothesis testing, and statistical analysis of both point and areal spatial patterns. Along the way, we’ll develop skills in using Excel, SPSS (formerly SPSS, then PASW, now SPSS again), and ArcGIS to conduct analysis, produce graphs, and make maps. ...no hopefully *not* violate any “cruel and unusual” punishment laws.

## Learning objectives

These are the specific topics that we’ll be covering during the course of the semester (in the education jargon, the “outcomes” that I’ll be assessing you on):

* Understand the types and special characteristics of spatial data
* Understand the utility of and how to conduct spatial and non-spatial descriptive statistics
* Understand basic inferential statistics and hypothesis testing
* Understand basic spatial statistical analysis
* Write and analyze questionnaires
* Demonstrate proficiency in Microsoft Excel for importing, manipulating, and basic analysis of data
* Demonstrate proficiency in ArcGIS for displaying spatial data and conducting basic spatial analysis

## Learning activities

What we’ll do for you to learn these things:

* Lecture/discussion – cover and discuss material as a group
* Short labs (in and out of class time) – brief activities to practice a particular skill
* Long labs (out of class time) – extended, more depth analysis of a particular question and data set

## Assessment and grading

How I’ll know that you’ve learned these things.

### Class participation and reading quizzes

You'll learn the most when you're not just passively sitting in class listening to me. For encouragement, 10% of your grade will come from participating in class discussions, posting to the on-line discussion boards (within D2L), and reading the required material. Participation includes attending class, taking part in in-class exercises, answering questions, and bringing in articles or other materials relevant to class. For reading, we'll have six unannounced quizzes on the day's required reading throughout the semester (I'll throw out your lowest score).

### Short labs

Much of the work for the class will be done in labs that are shorter that you may finish within class time. You'll conduct a statistical test that we've recently discussed on your own and produce a short write-up. Currently, I'm not sure how many we'll have (probably around 15). Many of these will be just for exposure and practice on a particular concept and may not be included in your grade. **I’ll let you know beforehand which labs are graded and how many points they’re worth**.

### Long lab

One of the labs will require more in-depth analysis and a more thorough write-up (think of it as your “big paper” project for the class. You’ll have the option of doing the long lab that I assign or coming up with a project on your own (for example, if you’re doing undergraduate research). You'll have several weeks to complete this assignment, and it will require quite a bit of outside-of-class time to complete.

### Exams

For the last bit of fun, we will have two exams through the course of the semester that will comprise a combination of multiple choice and short answer questions. These exams will be based on material in class discussion, labs, and assigned readings and will not be comprehensive.

### Grades

|  |  |  |
| --- | --- | --- |
| **Assignment** | **Points** | **Due date** |
| Class participation & quizzes | 10 | Ongoing |
| Short labs (~10x) | 50 | TBA\* |
| Long lab | 10 | TBA\* |
| Mid-term exam | 15 | March 7 or 9 |
| Final exam | 15 | May 9 |
| Total points | 100 |  |

## \*TBA means "to be announced" later.

## Tentative schedule of discussions and labs

Here's an overview of what the semester will look like and the topics we'll cover. It's tentative because I'll modify the syllabus as I learn more about your interests. **I expect that you will have read the assigned readings beforehand** (remember those quizzes?) and contribute to the class discussion about the topic at hand. Page numbers are for our textbook unless otherwise noted.

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Topic** | **Lab** | **Reading** |
| 1, Jan 17- 21 | P1: Introduction - Problem solving | Lab 1 - Applications | 3-12 |
|  | **Part I – Exploring numbers and data** |  |  |
| 2, Jan 24-28 | P2: Data (and Excel) P3: Data visualization | Lab 2 - Data in Excel Lab 3 - Graphs | 13-14, 16-22, 31-33, Pentecost reading, |
| 3, Jan 31- Feb 4 | P4: Data visualization in ArcGIS  P5: Descriptive statistics | Lab 4 - ArcGIS & Graph Maps Lab 5 - Descriptive stats | 16-18, 46-47  37-44 |
| 4, Feb 7-11 | P6: Spatial descriptive statistics | Lab 6 - Mean center | 46-50, 52-60 |
|  | **Part II – Inferential statistics** |  |  |
| 5, Feb 14-18 | P7: Introduction to inferential statistics P8: Probability and distributions | Lab 7 - Exploring probabilities Lab 8 - Z-scores | 65-81 |
| 6, Feb 21-25 | P9: Sampling and collecting data P10: Surveys | Lab 9 - Sampling design | 82-96, Bridge reading |
| 7, Feb 28- Mar 4 | P11: Estimation and confidence intervals | Lab 10 - Confidence intervals | 97-112, Batty reading |
| 8, Mar 7-11 | **Mid-term exam** | None | None |
| 9, Mar 14-18 | P12: Hypothesis testing | Lab 11 - Hypothesis testing | 115-123 |
| 10, Mar 21-25 | **No class - Spring Break** |  |  |
| 11, Mar 28- Apr 1 | P13: Two sample tests | Lab 12 - Two sample tests | 130-137 |
| 12, Apr 4-8 | P14: Correlation | Lab 13 - Correlation | 193-200, 207-8 |
|  | **Part III - Spatial statistics** |  |  |
| 13, Apr 11-15 | P15: Point patterns **No class on Wednesday** | Lab 13 - Random pattern or not? | 171-181 |
| 14, Apr 18-22 | P16: Spatial correlation & autocorrelation | Lab 14 - Moran's I and Getis G | 172 |
| 15, Apr 25-29 | P17: Spatial/landscape metrics | Lab 15 - Fragstats | [Fragstats manual](http://www.umass.edu/landeco/research/fragstats/documents/Conceptual%20Background/Background%20TOC.htm) |
| 16, May 2-6 | Recoup, recover, recap, and review | None | Study! Re-read everything! |
|  | **Final exam** **Mon, May 9, 1pm – 3pm** |  |  |

## Legal statements

Plagiarism will not be tolerated in any work as part of this class. Sources for ideas or quotes must be property cited using an accepted citation style (see the Library's citation guides at <http://library.uww.edu/guides>). Check out [Zotero](http://www.zotero.org) if you’d like a cool tool for citations. Come speak with me if you are unsure of how to cite other's work or what constitutes plagiarism. Don't plagiarize. It's all too easy for me to type a phrase in Google and find the original source.  
  
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