**Geog460 Spatial Analysis**

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**Classroom:** SH107

**Prerequisite**  
Geog360 Quantitative Geography, or equivalent.

**Textbooks**


**Course Goals and Outcomes**

**Goals**  
Generating useful information has become an extremely important task in a world where data are exploding. This is an advanced course in quantitative methods, which are widely used in research and practices. The course assumes that the students are familiar with basic statistical concepts such as descriptive statistics, referential statistics, hypothesis testing, basic probabilities, significance, confidence level, correlation, and simply regression. This course will focus on techniques for multivariate analysis. Topics that are going to be covered include ANOVA, Multivariate Regression, Cluster Analysis, Factor Analysis, Spatial Pattern, and Hot Spots Detection, among others. Emphasis of this course is going to be on how the methods can be applied to research and practices, while gaining a taste of the conceptual side.

**Outcomes**  
After finishing this course, students are expected to be able to conduct statistical analyses independently in their research and practices.

Since this is a three-credit course with a “2+1” split between lecture and lab, it is necessary to have some degree of flexibility in lecture/lab combinations. Lab time is allocated for students to get familiar with the software package (SPSS) and work on their exercises. If you cannot finish your work during the designated time, you need to find your own time to finish the assignments.

**Tentative Lecture Schedule**
<table>
<thead>
<tr>
<th>Date</th>
<th>Topics and Reading</th>
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| Feb. 1<sup>st</sup> | Introduction and review on descriptive statistics  
Chp. 1 (P.R) Chp 1&2 (Lee & Wong)                                                             |
| Feb. 8<sup>th</sup> | One-sample and two–sample t-tests for the means  
Chp. 3 (P.R.)                                                                                   |
| Feb. 15<sup>th</sup> | Analysis of variance  
Chp. 4 (P.R)                                                                                     |
| Feb. 22<sup>nd</sup> | Introduction to regression analysis  
Chp. 5&6 (P.R.)                                                                                   |
| Mar. 1<sup>st</sup> | More on regression analysis  
Chp. 7 (P.R.)                                                                                     |
| Mar. 8<sup>th</sup> | More on regression analysis                                                                                                                              |
| Mar. 15<sup>th</sup>: Exam 1                                                                                                                                 |
| Mar. 29<sup>th</sup> | Spatial patterns  
Chp. 8 (P.R.) Chp. 3 (Lee and Wang)                                                               |
| April 5<sup>th</sup> | AAG No class, continue working on Lab7                                                                                                                |
| April 12<sup>th</sup> | Spatial patterns cont.  
Chp. 8 (P.R.) and Chp. 5 (Lee and Wang)                                                               |
| April 19<sup>th</sup> | Factor analysis  
Chp. 10 (P.R.)                                                                                     |
| April 26<sup>th</sup> | Cluster analysis  
Chp. 10 (P.R.)                                                                                     |
| May 3<sup>rd</sup> and May 10<sup>th</sup> No meeting and work on projects                                                                          |
| May 17<sup>th</sup> | Presentation and term paper due                                                                                                                                 |

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**GEOG 460 Spatial Analysis**  
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**Grading Policies and Requirements**

The lecture and lab will be combined for grading and the students will receive the same grade for the lecture and lab.

1) **Grading items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Term paper</td>
<td>30%</td>
</tr>
<tr>
<td>Exercises</td>
<td>30%</td>
</tr>
<tr>
<td>Presentation</td>
<td>5%</td>
</tr>
<tr>
<td>Attendance</td>
<td>5%</td>
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</tbody>
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2) **The grading system:**

- A: >= 93
- A-: 88 – 92
- B+: 85 – 87
- B: 82 – 84
- B-: 78 – 81
- C+: 75 – 77
- C: 72 – 74
- C-: 68 – 71
- D+: 65 – 67
- D: 62 – 64
- D-: 60 – 61
- F: 0 – 59

Final grade will depend on the students’ absolute performance. In other words, the students’ scores will not be curved. Therefore, there are no limits of “A”. However, to pass the course, all students MUST complete the exam and the term paper. Otherwise, the students will be assigned a grade “I”.

3) **Exercises**

Students should complete their assignments by the deadline specified, and each assignment will be graded from 0 to 10. Late submission will get deduction: each day of delay will get 5% deduction from 10. Assignments submitted a week later will not be acceptable.

4) **Exam**

The format for the exam most likely is going to be open-book and open-note computer exercises. Students will be asked to implement analyses, given data and questions.
5) Term paper and presentation
Students are required to complete a term paper, using one of the major techniques learned within this class. Students are also required to present the project to his classmates in class. Without the term paper, the student will get an incomplete grade from this class.

6) Attendance and participation
Students need to come to class on a regular basis and each student is allowed 2 absences without approval, after which the 5 points will be deducted from the final grade. Attendance is extremely important for students to understand the course materials. However, if you do come to the classes as required, you are going to see the difference. The approval absences are only granted when the instructor is notified and agrees in advance.

7) Make-ups
Students are anticipated to take the exam at allocated time. Makes-ups are only granted in situations out of the students’ personal control and the instructor is notified and approves. In case make-ups are allowed, they should be taken as soon as possible after the scheduled time.

8) Academic honesty
Each student is expected to work independently, and any cheating on exams or exercises could lead to a grade “F”.

Note: this syllabus is tentative and is subject to change. It is the students’ responsibility to be aware of all the changes that are announced in class.