The Department of Sociology and Anthropology requests that SOC-107, Qualitative & Quantitative Analysis, be added to the list of courses that satisfy the Quantitative and Analytical Reasoning and Abstract Reasoning requirements.

1. The GE Document states,

Quantitative and Analytical Reasoning (4) Since many phenomena in our world can best be understood through quantitative and analytic methods, students should develop the ability to interpret, evaluate and communicate quantitative ideas. Central to courses satisfying this requirement is: the use of mathematical models for physical or social systems or; the understanding and communication of numeric data including the computation and interpretation of summative statistics and the presentation and interpretation of graphical representations of data. A core focus of the course should be the explicit study of quantitative and analytic methods, or, alternatively, the reflective use of quantitative methods as a tool.

The course deals extensively with “quantitative and analytic methods,” and this introductory statistics course covers several topics that fit the description in the GE Document. In particular, the attached syllabus from Spring 2009 lists the following topics.

Descriptive Statistics. Descriptive statistics focuses on organizing and summarizing the data about social systems in a systematic fashion. Students will develop the ability to interpret, evaluate, and communicate quantitative ideas using numeric, graphical, and tabular presentations of information about social systems. The numeric presentation includes computation and interpretation of the central tendency and variability of the data concerning social systems. The measures of central tendency include mode, median, and mean. The measures of variability include the index of qualitative variation, the range, the inter-quartile range, variance, and standard deviation. The graphic presentation mainly focuses on constructing pie charts, bar charts, histograms, statistical maps, frequency polygons, time series charts, and box plots. The tabular presentation includes frequency tables and cross-tabulation. Students will also learn how to apply this statistical knowledge and these techniques to understanding the phenomenon beyond the social system, such as the summary statistics of global warming.

Inferential statistics. A core focus of the course is on inferential statistics and how to generalize the findings from a sample to a population. Students will first learn normal distribution and random sampling to lay the foundation for understanding statistical assumptions and for making statistical inference. Students will learn the techniques of inferential statistics,
which include point and interval estimations, hypothesis testing, cross-tabulation, the Chi-Square test, measures of associations for nominal and ordinal level measurements, regression and correlation, and analysis of variance. Students will use this knowledge and these techniques to discern patterns and to develop appropriate statistical models after analyzing the data, to test the hypothesis, and subsequently to interpret, evaluate and communicate quantitative ideas.

2. The GE Document states,

**Reasoning Abstractly.** Courses satisfying this requirement focus on critical and analytical reasoning about non-empirical, abstract concepts, issues, theories, objects and structures. Students in these courses should learn to understand and evaluate abstract arguments and explanations, analyze abstract concepts and solve abstract problems.”

The course extensively uses “critical and analytical reasoning,” and it is another primary focus of the course to help “students to understand and evaluate abstract arguments and explanations, analyze abstract concepts and solve abstract problems.” In particular, the attached syllabus from Spring 2009 lists the following topics.

**Sampling and Sampling Distribution.** Sampling and sampling distribution are the foundations for using statistics of a sample to estimate the parameters of a population. This involves understanding non-empirical, abstract concepts and theories of probability and critical and analytical reasoning. For example, students will be able to identify what is probability sampling and what is not and to understand why the findings from a non-probability sample cannot be generalized to a population.

**Inferential Statistics.** Inferential statistics focuses on generalization. Students will learn statistical knowledge and techniques, such as point and interval estimations, hypothesis testing, cross-tabulation, the Chi-Square test, measures of associations for nominal and ordinal level measurements, regression and correlation, analysis of variance, and significance tests. These statistical tools are highly abstract. Students will learn to use deductive reasoning to develop a hypothesis and to use inductive reasoning to find evidence from data to accept or reject the hypothesis using appropriate statistical tools. For example, a student is interested in gender inequality. Marriage may affect the status of women negatively and that of men positively. The student may hypothesize that married women tend to earn less at every educational level than married men. The student can then use bivariate regression to look at the return of educational achievement for married men and married women who work full-time. The data can be easily obtained from the U.S. General Social Survey. Using the bivariate regression, the student can predict with every unit increase in education the increase of men and women’s annual income and its variation. Specifically, married men earn significantly more than married women. Thus the student can conclude that marriage influences men and women differently; gender inequality in terms of earned income and marital status does exist. In order to solve this social problem, it is essential for the student to differentiate arguments from facts. Through exercises such as these, students will not only apply statistical tools to test the
hypothesis but also, more importantly, to understand the reasoning that leads to solutions of problems such as gender inequality—an abstract concept. To do so, students also must recognize premises and conclusions and the relationships between them.

**Different Components of the Course:** The syllabus attached has specified the primary contents of different components of the course. The supplementary information below further explains the course design.

**Readings:**


The textbook covers all the topics that will be taught in the course. The strengths of the textbook include a close link between the practice of statistics, important social issues, and real-world examples and exercises that focus on diversity both in the U.S. and in the world as well as an emphasis on computing. The data used in the textbook are mostly from 2006 General Social Survey (GSS). GSS data are the most frequently used and highly respected in the social sciences.


This article was written by two prominent sociologists and published in one of the most important journals in the field; however the statistical techniques they used, descriptive statistics and OLS Regression, are very basic and are covered in the class. I will distribute the article to the students to illustrate a scholarly writing style and how to translate statistical language into academic language.

**Lectures.** The lecture component focuses on explaining the statistical concepts, theories and techniques and nurtures students’ ability to reason abstractly. At the same time, they help students to establish a firm statistical perspective on the social world.

**Lab:** The primary task of the lab section is to teach students how to use SPSS to do data analysis and how to present findings in a scholarly fashion. The data set is the 2006 GSS. Students will learn data entry and data management including recoding and sorting data, sampling from the data set, identifying problem cases, coping with missing values, analyzing data, writing report, and translating statistical language into academic language.

**Group Projects:** There are three group projects, and the data is from 2006 General Social Survey (GSS). The 2006 GSS data set has 5137 variables and 4510 cases. The goal of the three group projects is three-fold: first, to give students the opportunity to learn from each other; second, to nurture student’s ability to apply statistical knowledge and techniques to real research and thus produce knowledge contributing to the understanding of the social world; and finally to nurture student’s ability to reason abstractly.
For the first group project, students will use descriptive statistical skills. Specifically they will use the graphic presentations and measures of central tendency and dispersion to present basic findings of data analysis. Students will choose one of three topics: racial inequality, gender inequality, or class inequality. Students will select their own indicators and appropriate statistical measurements and graphic presentation to demonstrate one of these three types of inequality. The final product of the group project will be a paper.

The second group project gives students the opportunity to use cross-tabulation, the Chi-Square test, and measures of association for nominal and ordinal variables to explore social issues. Students can choose any topic of interest with the instructor's consent. Students have to develop a set of testable hypotheses and choose appropriate statistical techniques to test the hypotheses. Students will collectively produce a paper following the survey report format.

For the last group project, students will use regression, correlation, and analysis of variance to explore a social issue of their interest with the instructor's consent. Students will collectively write an academic paper following the format of American Sociological Review journal.
General Education Submission Form

Electronic submissions are preferred.

A. GE component for which course is being proposed: Qualitative & Quantitative Analysis

B. Submitted by Laura Montgomery, for the Sociology/Anthropology Department

C. Ideally, submissions should be discussed by the entire department prior to submittal.

   √ Chair has reviewed and approved the course.

D. Course being proposed (please attach syllabus): SOC-107, Qualitative & Quantitative Analysis

E. This course

   √ Has not been modified, but is being submitted to check its suitability
   √ Has had its syllabus rewritten to communicate the course’s contribution to GE
   √ Has had its contents modified to address the relevant GE issues
   □ Is a new course designed to fulfill the GE requirement

F. This course is being submitted as

   □ A Template. Applicable to courses with multiple sections which require only general training in the discipline. The submission should come from the department chair and should clearly identify what course content and what elements of the syllabus the department has agreed will common to all sections. Upon approval by the GE Committee, any course whose syllabus is determined by the department to meet the specifications of the template is approved to satisfy this area requirement. A copy of each syllabus should be forwarded to the G.E. committee for record keeping purposes.

   √ An Individual Course. Applicable to courses requiring specialized training in the discipline or are typically offered by a particular instructor. The course should be resubmitted and reassessed in the event of a change in staffing or syllabus.

G. Statement of rationale (please identify the lectures/reading/assignments from the syllabus that address the GE area specifications as delineated in the GE and supplemental documents) Please see attached memo.
The course is designed to familiarize you with fundamental statistical concepts and techniques. It emphasizes describing data and testing hypotheses. Many examples are drawn from diverse sociological topics and illustrated with national survey data.

Because the course is taught by a sociologist, most of the examples and demonstrations will be drawn from the social sciences. However, the concepts and techniques presented in the course apply much more broadly to other disciplines and to other areas of life.

Lectures expose you to the theoretical bases of statistical methods and how to use them in social research. Laboratory sessions teach computing skills and data processing techniques. Test questions, lab assignments, and the group project help you to gain deeper understanding of statistical knowledge and techniques by doing. The emphasis throughout the semester is on learning by doing. The textbook, course notes, and lab assignments have been built around the testing substantive social theoretical hypotheses with real data.

The course includes overviews of the logic of sampling and causal inference; the different levels of measurement; techniques for graphically and numerically describing distributions; measures of central tendency and dispersion; the normal curve; relationship between quantitative variables; relationships between categorical variables; probability; random variables, sampling distribution; statistical inference; confidence intervals; hypothesis testing; bivariate linear regression; analysis of covariance; and multiple regression.

Although you are not expected to become expert statistician, you are expected, upon completion of this course, to be able to understand how statistics can be used to address key social science questions. As you gain more familiarity and confidence in using statistical tools to ask and answer sophisticated questions about social relationships, you acquire a greater ability to read and comprehend the current literature in social sciences. If you want to do quantitatively oriented senior projects, you should be able to carry out that task. Moreover, you should be able to evaluate critically the statistical information that appears in the media and elsewhere.

This course is foundational to your sociology or anthropology major. A common quip of our disciplines is that “sociology or anthropology is what sociologists and anthropologists do.” Methodological skills also comprise one of the four major skill areas around which the department faculty has built the major. These skills are listed below. Note that the relationship between these departmental learning outcomes with the college-wide learning standards is in parentheses:

1. Students are able to develop a research problem and select appropriate methods and data analysis techniques consistent with disciplinary and Christian ethics. (Critical-Interdisciplinary Thinking; Christian Orientation)
2. Students understand and can use the major research methods of both disciplines. (Critical Interdisciplinary Thinking)
3. Students are also able to manage and document appropriately any data they have collected using those methods. (Technology)
4. Students will understand and can use quantitative data analysis techniques. (Technology)
5. Students are able to articulate the relevance of sociology to Christian missions (Christian orientation, diversity);
6. Students are be able to access selected electronic resources related to sociology and demonstrate some ability to assess their credibility (technology);
7. Students are able to demonstrate good written and oral communication skills as you accomplish goals 1-6 (written and oral communication).

**COURSE MATERIALS AND REQUIREMENTS**


**Calculator:** Bring a cheap hand calculator with a square-root key to every class.

**A Rewritable CD or a Portable Flash Drive Stick** is necessary to save the data and your lab work.

**Computer:** We will use the Statistical Package in the Social Sciences (SPSS). Instructions on accessing the computer system and analyzing General Social Survey dataset are provided in handouts and lab demonstrations.

**Degrees of Difficulty:** Teaching this course at a pace and level that satisfactorily meets every student’s interests, needs, and abilities is impossible. Therefore, I intend to aim at a middle range, which inevitably means that some students will be annoyed by the class’s plodding pace while others are exasperated by its too-fast coverage. If you find yourself experiencing boredom and/or frustration, please come and talk with me personally about how we could better meet your learning requirements.

**COURSE GRADES**

**Grading:** Course grades are based on the scores of these components: (a) three in-class exams, each covering a preceding portion of the course; (b) 10 lab assignments; (c). 12 homework assignments; and (d) 3 group project. The scores are not calculated on a “curve” but are based on each student’s demonstrated understanding of the material.

Course grades will be determined the four components above, using the following percentage weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Exams</th>
<th>Lab Assignments</th>
<th>Homework Assignments</th>
<th>Three Group Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT1 10%, MT2 10%, FE 15%</td>
<td>35% Total</td>
<td>20% Total</td>
<td>30% Total</td>
<td>15% Total</td>
</tr>
</tbody>
</table>

**Examinations:** All exams are “semi-open note.” That is, to assist you in your answers, you may bring ONE sheet of paper to class with formulas, definitions, and other information, written on both sides. Your must write your name at the top of this sheet and enclose it in your exam booklet to be turned in at the end of the exam period.
Grading Scale: For the course grade, the following numerical ranges translate into letter grades (averages involving 0.50 point will be rounded up to the nearest integer):

- A+ 98% and above
- A 93-97 %
- A- 90-92 %
- B+ 87-89 %
- B 83-86 %
- B- 80-82 %
- C+ 77-79 %
- C 73-76 %
- C- 70-72 %
- D+ 67-69 %
- D 60-66 %
- F 59 % and below

### Miscellaneous Notes

**Make-up policy:**
- Assignments turned in late will result in a loss of 10% per day of your grade for that specific assignment.
- Make-up for in-class writing assignments are **not allowed unless** you meet **all** of the following criteria:
  - You have missed the class due to documented or emergency situations,
  - You have notified me **no later than** the day of the class, and
  - You meet with me to discuss the materials covered during the class.

**Scholastic Dishonesty** is defined as any act that violates the rights of another student with respect to academic work or that involves misrepresentation of a student’s work. Scholastic dishonesty includes (but is not limited to) cheating on assignments or examinations, plagiarizing (misrepresenting as one’s own anything done by another), inventing or falsifying research or other findings with the intent to deceive, submitting the same or substantially similar papers (or creative work) for more than one course without consent of all instructors concerned, depriving another of necessary course materials, and sabotaging another’s work.

Students who commit scholastic dishonesty during this course will receive a zero grade for any assignment or exam concerned.

**Disability Accommodation:**
Any student with a documented disability condition (e.g., physical, learning, psychiatric, systemic, vision, hearing, etc.) who needs to arrange reasonable accommodations should contact the instructor and Disability Services at the beginning of the semester. The phone number of the Disability Services is 565-6159.
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topic</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>01/12, 14, 16</td>
<td>Introduction to Social Statistics</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>01/20, 21, 23</td>
<td>Frequency Distributions</td>
<td>2</td>
</tr>
<tr>
<td>Tuesday</td>
<td>01/20</td>
<td>Observes Monday Class due to MLK Holiday</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>01/26, 28, 30</td>
<td>Graphic Presentation</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>02/2, 4, 6</td>
<td>Measurement of Central Tendency</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>02/9, 11, 13</td>
<td>Measurement of Variability</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>02/18, 20</td>
<td>The Normal Distribution</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Presidents Holiday (February 16-17 Monday-Tuesday)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group Project 1: Due on 2/20</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>02/23, 25, 27</td>
<td>Sampling and Sampling Distribution</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>03/2, 4, 6</td>
<td>Estimation</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>03/9, 11, 13</td>
<td>Testing Hypotheses</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Midterm (March 9th Monday)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Spring Recess March 16-20 Monday--Friday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>03/23, 25, 27</td>
<td>Cross-Tabulation</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>03/30, 04/1, 3</td>
<td>The Chi-Square Test</td>
<td>11</td>
</tr>
<tr>
<td>13</td>
<td>04/6, 8</td>
<td>Measures of Association for Nominal and Ordinal Variables</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Eater Recess April 10, 13, Friday, Monday</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group Project 2: Due on 4/8</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>04/15, 17</td>
<td>Regression and Correlation</td>
<td>13</td>
</tr>
<tr>
<td>15</td>
<td>04/20, 22, 24</td>
<td>Analysis of Variance</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>04/27, 29</td>
<td>Review for Final Exams</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group Project 3: Due on 4/29</td>
<td></td>
</tr>
</tbody>
</table>

April 29th is the last day of the class

Final Exam: 12-2pm, May 7th Thursday