ARIZONA STATE UNIVERSITY

GENERAL STUDIES PROGRAM COURSE PROPOSAL COVER FORM

Courses submitted to the GSC between 2/1 and 4/30 if approved, will be effective the following Spring.

Courses submitted between 5/1 and 1/31 if approved, will be effective the following Fall.

(SUBMISSION VIA ADOBE.PDF FILES IS PREFERRED)

DATE 1/20/2011

1. ACADEMIC UNIT: School of Public Affairs

2. COURSE PROPOSED: PAF 301 Applied Statistics 3
   (prefix) (number) (title) (semester hours)

3. CONTACT PERSON: Name: Chris Hiryak Phone: 6-0465
   Mail Code: 3720 E-Mail: chris.hiryak@asu.edu

4. ELIGIBILITY: New courses must be approved by the Tempe Campus Curriculum Subcommittee and must have a regular course number. For the rules governing approval of omnibus courses, contact the General Studies Program Office at 965-0739.

5. AREA(S) PROPOSED COURSE WILL SERVE. A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study. (Please submit one designation per proposal)

   Core Areas
   - Literacy and Critical Inquiry—L
   - Mathematical Studies—MA
   - Humanities, Fine Arts and Design—HU
   - Social and Behavioral Sciences—SB
   - Natural Sciences—SQ

   Awareness Areas
   - Global Awareness—G
   - Historical Awareness—H
   - Cultural Diversity in the United States—C

6. DOCUMENTATION REQUIRED.
   (1) Course Description
   (2) Course Syllabus
   (3) Criteria Checklist for the area
   (4) Table of Contents from the textbook used, if available

7. In the space provided below (or on a separate sheet), please also provide a description of how the course meets the specific criteria in the area for which the course is being proposed.

   CROSS-LISTED COURSES: ☑ No ☐ Yes; Please identify courses: __________________________

   Is this an unscheduled course?: ☑ No ☐ Yes; Is it governed by a common syllabus? __________________

   Afshaneh Nahavandi
   Chair/Director (Print or Type)

   __________________________
   Chair/Director (Signature)

Rev. 1/94, 4/95, 7/98, 4/00, 1/02, 10/08
Arizona State University Criteria Checklist for
MATHEMATICAL STUDIES [CS]

Rationale and Objectives

The Mathematical Studies requirement is intended to ensure that students have skill in basic mathematics, can use mathematical analysis in their chosen fields, and can understand how computers can make mathematical analysis more powerful and efficient. The Mathematical Studies requirement is completed by satisfying both the Mathematics [MA] requirement and the Computer/Statistics/Quantitative Applications [CS] requirement explained below.

The Mathematics [MA] requirement, which ensures the acquisition of essential skill in basic mathematics, requires the student to complete a course in College Mathematics, College Algebra, or Precalculus, or demonstrate a higher level of skill by completing a mathematics course for which any of the first three courses in a prerequisite.

The Computer/Statistics/Quantitative Applications [CS] requirement, which ensures skill in real world problem solving and analysis, requires the student to complete a course that uses some combination of computers, statistics, and mathematics.

Approved: Feb. 2000
Proposer: Please complete the following section and attach appropriate documentation.

### ASU--[CS] CRITERIA

**A COMPUTER/STATISTICS/QUANTITATIVE APPLICATIONS [CS] COURSE MUST SATISFY ONE OF THE FOLLOWING CRITERIA: 1, 2, OR 3**

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<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
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</table>

1. **Computer applications**: courses must satisfy both a and b:
   - a. Course involves the use of computer programming languages or software programs for quantitative analysis, modeling, simulation, animation, or statistics.
   - b. Course requires students to analyze and implement procedures that are applicable to at least one of the following problem domains (check those applicable):
     - i. Spreadsheet analysis, systems analysis and design, and decision support systems.
     - ii. Graphic/artistic design using computers.
     - iii. Music design using computer software.
     - iv. Modeling, making extensive use of computer simulation.
     - v. Statistics studies stressing the use of computer software.

*The computer applications requirement cannot be satisfied by a course, the content of which is restricted primarily to word processing or report preparation skills; learning a computer language or a computer software package; or the study of the social impact of computers. Courses that emphasize the use of a computer software package or the learning of a computer programming language are acceptable, provided that students are required to understand, at an appropriate level, the theoretical principles embodied in the operation of the software and are required to construct, test, and implement procedures that use the software to accomplish tasks in the applicable problem domains.*

2. **Statistical applications**: courses must satisfy both a and b:
   - a. Course has a minimum mathematical prerequisite of College Mathematics, College Algebra, or Precalculus, or a course already approved as satisfying the MA requirement.
   - b. The course must be focused principally on developing knowledge in statistical inference and include coverage of all of the following:

Syllabus and table of contents
### ASU--[CS] CRITERIA

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
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<tbody>
<tr>
<td>✔️</td>
<td>☐</td>
<td>i. Design of a statistical study.</td>
</tr>
<tr>
<td>✔️</td>
<td>☐</td>
<td>ii. Summarization and interpretation of data.</td>
</tr>
<tr>
<td>✔️</td>
<td>☐</td>
<td>iii. Methods of sampling.</td>
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<tr>
<td>✔️</td>
<td>☐</td>
<td>iv. Standard probability models.</td>
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<tr>
<td>✔️</td>
<td>☐</td>
<td>v. Statistical estimation</td>
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<tr>
<td>✔️</td>
<td>☐</td>
<td>vi. Hypothesis testing.</td>
</tr>
<tr>
<td>✔️</td>
<td>☐</td>
<td>vii. Regression or correlation analysis.</td>
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</tbody>
</table>

#### 3. Quantitative applications: courses must satisfy both a and b.

a. Course has a minimum mathematical prerequisite of College Mathematics, College Algebra, or Precalculus, or a course already approved as satisfying the MA requirement.

b. The course must be focused principally on the use of mathematical models in quantitative analysis and design making. Examples of such models are:

- i. Linear programming.
- ii. Goal programming.
- iii. Integer programming.
<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
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<tbody>
<tr>
<td></td>
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<td>iv. Inventory models.</td>
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<td></td>
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<td>v. Decision theory.</td>
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<tr>
<td></td>
<td></td>
<td>vi. Simulation and Monte Carlo methods.</td>
</tr>
<tr>
<td></td>
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<td>vii. Other (explanation must be attached)</td>
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<tr>
<td>Criteria</td>
<td>How course meets spirit</td>
<td>Evidence</td>
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</tr>
<tr>
<td>Course has a minimum mathematical prerequisite of College Mathematics, College Algebra, or Precalculus, or a course already approved as satisfying the MA requirement.</td>
<td>PAF 301 requires MAT 142 or higher.</td>
<td>See ASU Catalog.</td>
</tr>
<tr>
<td>The course must be focused principally on developing knowledge in statistical inference and include coverage of all of the following:</td>
<td>See below.</td>
<td>See below.</td>
</tr>
<tr>
<td>Design of a statistical study.</td>
<td>PAF 301 places the use of statistics within the context of the larger research design. Students are expected to formulate and indentify hypotheses, variables, unit of analysis, and appropriate statistical tests.</td>
<td>See syllabus (Learning Objectives, Course Schedule) and Table of Contents</td>
</tr>
<tr>
<td>Summarization and interpretation of data.</td>
<td>Students are required to interpret, summarize and analyze descriptive and inferential statistical data throughout the course.</td>
<td>See syllabus (Learning Objectives, Course Schedule) and Table of Contents</td>
</tr>
<tr>
<td>Methods of sampling.</td>
<td>Students learn the concept of inferential statistics and random sampling, as well as sampling error and sampling bias.</td>
<td>See syllabus (Learning Objectives, Course Schedule) and Table of Contents</td>
</tr>
<tr>
<td>Standard probability models.</td>
<td>Students learn about probability and probability distributions including the normal curve, central limit theorem and z-scores.</td>
<td>See syllabus (Learning Objectives, Course Schedule) and Table of Contents</td>
</tr>
<tr>
<td>Statistical estimation.</td>
<td>Students learn how to construct confidence intervals and statistical significance.</td>
<td>See syllabus (Learning Objectives, Course Schedule) and Table of Contents</td>
</tr>
<tr>
<td>Hypothesis testing.</td>
<td>Students learn how to test the null and research hypothesis, as well as to calculate a z-test, t-test, and chi-square.</td>
<td>See syllabus (Learning Objectives, Course Schedule) and Table of Contents</td>
</tr>
<tr>
<td>Regression or correlation</td>
<td>Students learn correlation (both</td>
<td>See syllabus (Learning</td>
</tr>
<tr>
<td>analysis.</td>
<td>Pearson’s and Spearman rho) as well as linear regression. Students are also expected to interpret and analyze correlation and regression data using computer generated results.</td>
<td>Objectives, Course Schedule) and Table of Contents</td>
</tr>
</tbody>
</table>
PAF 301 Applied Statistics
Spring 2011
Syllabus and Course Information

Instructor Information
Chris Hiryak  
E-mail: chris.hiryak@asu.edu  
Phone: 602-496-0465  
Fax: 602-496-0950  
Office: University Center (UCENT) 433,  
Downtown Phoenix campus

Required Text
Sirkin, R. Mark. Statistics for the Social Sciences, 3rd edition. Sage Publications, 2006. The required text can be purchased at the ASU Bookstore. In addition, copies (both new and used) can be purchased at on-line sites such as: www.bn.com and www.amazon.com. Students can also purchase an older edition if one is available and more affordable. However – keep in mind that page numbers and titles may vary among different editions.

Course Description
Enrollment requirements: Pre-requisites: MAT 142 or higher

PAF 301 focuses on statistical techniques used in social science research. We will apply concepts such as measures of central tendency and dispersion as well as statistical techniques, including the following: one-sample z and t tests, two-sample t tests, chi-square, and correlation. Goals of the course include helping students understand the mathematical and statistical concepts presented and assisting them in using these concepts in everyday life and in the study of social sciences.

The objective of PAF 301 is to develop a foundation of statistical expertise applicable to public administration and public policy. Course content will broadly examine the functions of statistics, examining descriptive measures, associational measures and inferential statistics. Throughout the class, we will focus on rationale for selecting statistics, the logic of statistics and the interpretation of coefficients. We will not concentrate on mathematics or memorizing formulas. We will place the use of statistics in the broader context of research design to ensure that what we learn here connects to the larger problem of investigation.
We will view statistics as tools available to help us understand data that will be brought to bear on applied research problems. Data analysis involves reasoning and our use of statistics constitutes one point of information in the reasoning and arguments we construct in understanding relationships among measured variables.

**Learning Objectives**

At the end of the course, students will understand uses of statistics, descriptive and inferential statistics, measurement concepts, statistical distributions, measures of central tendency, measures of dispersion, frequencies, sampling distributions, interval estimation, probability concepts, tests of significance, and measures of association.

Students will also learn how to operationalize concepts, create an index, use frequency tables, use measures of central tendency and dispersion as tools of analysis, interpret cross-tabs, understand statistical significance, use t-tests, choose the correct statistical test for an application, read SPSS computer results, and understand regression analysis.

The class will involve homework assignments and an optional final examination based on the readings and course materials. All grades will be posted on Blackboard, which students can check throughout the class.

**Submitting Assignments**

Directions for downloading assignments are listed on Blackboard. The preferred method for submitting assignments is by e-mail attachment. Save your assignment as your last name and the assignment number. For Assignment #1, I would save my file as hiryak1; Assignment #2 would be saved as hiryak2 and so on. Once you have completed an assignment, attach the file to an e-mail message and send the message to: paf401@asu.edu.

IMPORTANT: Always include your name and the assignment name in every e-mail. Because there are so many viruses, unless you let me know in your e-mail message that you are attaching Assignment #1, #2, etc., I will delete the message without opening the attachment.

If you are having problems attaching files, you can copy your assignment, paste it into the body of an e-mail message, and send the message to: paf401@asu.edu. Remember, I must receive your assignment by 9:00 AM on the due date in order for you to receive full credit.

You will receive a confirmation e-mail from me saying that I received your assignment by the end of the day the assignment is due. If you do not receive one, that means I did not receive your assignment.

All assignments must be turned in on time for full-credit. ALL assignments (including the final) are due no later than 9:00 AM on their due date. It is your responsibility to make certain your assignments are turned in on time. Computer-related problems (i.e., "my email isn't working" or "I wasn't near my computer") are not acceptable excuses for late assignments.
Assignments turned in late will be deducted 10% of their total point value for each day late. For example, an assignment worth 20 points that is turned in two days late will be deducted 4 points. All work must be turned in by 9:00 AM on May 11th. Any work submitted after that will not be accepted.

After you submit your assignment, we will send you our answers to the assignment as an email attachment. Use these answers not only to check yourself but also, to help you on future assignments.

Extra Credit
Three extra credit assignments will be available throughout the semester. Information on these assignments will be announced on the course’s Blackboard page.

Final Exam
The final exam will be optional. This means that you are not required to complete or submit the exam. If you choose not to complete the final, then your final grade for the course will be based on the five assignments that have been completed throughout the semester.

For example: if your total points for all five assignments are 90, then you calculate your grade by dividing by the total points possible (100). The result: 90/100 = .90 = 90% = B+.

If you do choose to complete the final, then your final grade will be calculated by dividing by the total points possible (140). For example, a final point total of 126 will equal a percentage total of 90% which will be a final grade of B+.

Keep in mind the final is not extra credit – if you choose to complete it, how you do can impact your final grade. It is important to take your time and answer all the questions thoroughly. It is also important to provide detailed analyses. Use my comments and the answers provided with each assignment to help you on the exam.

Grading
The point values for each assignment are as noted below:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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<tbody>
<tr>
<td>Assignment #1</td>
<td>20</td>
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<td>Assignment #2</td>
<td>20</td>
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<td>Assignment #3</td>
<td>20</td>
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<tr>
<td>Assignment #4</td>
<td>20</td>
</tr>
<tr>
<td>Assignment #5</td>
<td>20</td>
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<tr>
<td>Final Exam (optional)</td>
<td>40</td>
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</tbody>
</table>

**TOTAL POINTS** 140
The cutoff for final grades in the course is:

- A+  100-98%
- A    97-95%
- A-   94-92%
- B+   91-88%
- B    87-85%
- B-   84-82%
- C+   81-78%
- C    77-70%
- D    69-60%

To determine your final percentage, divide your final point total by the total points available in the class (140 if you take the final, 100 if you do not).

For example, a final point total of 126 will equal a percentage total of 90% which will be a final grade of B+.

If you choose not to submit a final exam, your final grade will be based on the total points from the five assignments. For example: if your total points for all five assignments are 90, then you calculate your grade by dividing by the total points possible (100). The result: 90/100 = .90 = 90% = B+.

Any final percentage total less than 60% will result in a final grade of E.

**Course Schedule**

The following is the course schedule and assignment deadlines. It is the student’s responsibility to follow this schedule and keep track of all due dates and times.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/18-2/7</td>
<td>Intro to Course and Statistics</td>
<td>• Familiarize yourself with downloading/uploading documents, assignments, discussion board and other components in Blackboard</td>
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<td></td>
<td>Levels of Measurement</td>
<td>• Read “Concepts and Terms” (<em>course documents</em>)</td>
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<td></td>
<td>Defining Variables</td>
<td>• Review “Order of Operations” videos (<em>if needed</em>)</td>
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<td></td>
<td></td>
<td>• Read Lecture 1 (<em>course documents</em>)</td>
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<td>• Watch “What is Statistics?” (<em>course documents</em>)</td>
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<td>• Read Chapter 1 (text)</td>
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<td></td>
<td>• Read Lecture 2 (<em>course documents</em>)</td>
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<tr>
<td>Date</td>
<td>Topics</td>
<td>Assignments</td>
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<td>2/8-2/28</td>
<td>Central Tendency, Measures of Dispersion</td>
<td>Read Lecture 4 (course documents)</td>
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<td>Watch “Mean and Median” (course documents)</td>
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<td>Read Chapter 4 (text)</td>
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<td>Read Lecture 5 (course documents)</td>
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<td>Watch “Measures of Variability” (course documents)</td>
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<td>Read Chapter 5 (text)</td>
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<td><strong>DUE Assignment 1:</strong> 9:00 AM on February 7</td>
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<tr>
<td>2/8-2/28</td>
<td>Intro to Contingency Tables</td>
<td>Read Lecture 6 (course documents)</td>
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<td>Read Chapter 6 (text)</td>
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<td></td>
<td>Intro to Inferential Statistics</td>
<td>Read Lecture 7 (course documents)</td>
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<td>Read Chapter 7 (text)</td>
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<td>Probability</td>
<td>Read Lecture 8 (course documents)</td>
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<td></td>
<td>Watch “Standard Scores” (course documents)</td>
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<td></td>
<td>Read Chapter 8 (text)</td>
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<td></td>
<td></td>
<td><strong>DUE Assignment 2:</strong> 9:00 AM on February 28</td>
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<tr>
<td>3/1-3/28</td>
<td>Tests of Significance: z</td>
<td>Read Lecture 9 (course documents)</td>
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<td></td>
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<td>Read Chapter 9 (text)</td>
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<td></td>
<td>Tests of Significance: t</td>
<td>Read Lecture 10 (course documents)</td>
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<td>Read Lecture 11 (course documents)</td>
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<td></td>
<td>Measures of Association</td>
<td>Read Chapter 11 (text)</td>
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<td></td>
<td></td>
<td><strong>DUE Assignment 3:</strong> 9:00 AM on March 28</td>
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<tr>
<td>3/29-4/11</td>
<td>Chi-square</td>
<td>Read Lecture 12 (course documents)</td>
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<td></td>
<td>Correlation</td>
<td>Read Chapter 12 (text)</td>
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<td></td>
<td>Regression Analysis</td>
<td>Read Lecture 13 (course documents)</td>
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<td></td>
<td>Watch “Correlations” (course documents)</td>
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<td>Read Chapter 13-14 (text)</td>
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<td>Read Lecture 14 (course documents)</td>
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<td><strong>DUE Assignment 4:</strong> 9:00 AM on April 11</td>
</tr>
<tr>
<td>5/3-5/11</td>
<td>Final Exam</td>
<td>Final Exam due at 9:00 AM on May 11</td>
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<tr>
<td></td>
<td></td>
<td><strong>DUE Assignment 5:</strong> 9:00 AM on May 2</td>
</tr>
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