

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 | | | |
| YES | NO | | Identify Documentation Submitted |
| | | 1. Computer applications*: courses must satisfy both a and b : | |
| <input type="checkbox"/> | <input type="checkbox"/> | 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): | |
| <input type="checkbox"/> | <input type="checkbox"/> | i. Spreadsheet analysis, systems analysis and design, and decision support systems. | |
| <input type="checkbox"/> | <input type="checkbox"/> | ii. Graphic/artistic design using computers. | |
| <input type="checkbox"/> | <input type="checkbox"/> | iii. Music design using computer software. | |
| <input type="checkbox"/> | <input type="checkbox"/> | iv. Modeling, making extensive use of computer simulation. | |
| <input type="checkbox"/> | <input type="checkbox"/> | v. Statistics studies stressing the use of computer software. | |
| <p>*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.</p> | | | |
| | | 2. Statistical applications: courses must satisfy both a and b . | |
| <input type="checkbox"/> | <input type="checkbox"/> | 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: | |

| ASU--[CS] CRITERIA | | | |
|---------------------------|--------------------------|--|----------------------------------|
| YES | NO | | Identify Documentation Submitted |
| <input type="checkbox"/> | <input type="checkbox"/> | i. Design of a statistical study. | |
| <input type="checkbox"/> | <input type="checkbox"/> | ii. Summarization and interpretation of data. | |
| <input type="checkbox"/> | <input type="checkbox"/> | iii. Methods of sampling. | |
| <input type="checkbox"/> | <input type="checkbox"/> | iv. Standard probability models. | |
| <input type="checkbox"/> | <input type="checkbox"/> | v. Statistical estimation | |
| <input type="checkbox"/> | <input type="checkbox"/> | vi. Hypothesis testing. | |
| <input type="checkbox"/> | <input type="checkbox"/> | vii. Regression or correlation analysis. | |
| | | 3. Quantitative applications: courses must satisfy both a and b. | |
| <input type="checkbox"/> | <input type="checkbox"/> | 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: | |
| <input type="checkbox"/> | <input type="checkbox"/> | i. Linear programming. | |
| <input type="checkbox"/> | <input type="checkbox"/> | ii. Goal programming. | |
| <input type="checkbox"/> | <input type="checkbox"/> | iii. Integer programming. | |

| ASU--[CS] CRITERIA | | | |
|---------------------------|--------------------------|--|---|
| YES | NO | | Identify Documentation Submitted |
| <input type="checkbox"/> | <input type="checkbox"/> | iv. Inventory models. | |
| <input type="checkbox"/> | <input type="checkbox"/> | v. Decision theory. | |
| <input type="checkbox"/> | <input type="checkbox"/> | vi. Simulation and Monte Carlo methods. | |
| <input type="checkbox"/> | <input type="checkbox"/> | vii. Other (explanation must be attached) | |