

1. Department, Course Number, and Course Title:

MECHANICAL ENGINEERING

CE/ME211 STATISTICS AND PROBABILITY FOR ENGINEERS

2. Designation: Required Elective
Lower Division Upper Division

3. Course Description: Introduction to calculations using probabilities and densities; concepts in statistics; application to engineering problems

4. Prerequisites: MATH 208, Calculus III; PHYS 201, General Physics I

5. Text and Materials: Miller and Freund's Probability and Statistics for Engineers, Fifth Edition Richard A. Johnson, Prentice-Hall, 1994

6. Course Objectives: This course teaches and prepares engineering students the statistical methods of data analysis and basic probability theory for engineering application.

Course Outcomes

- an ability to apply knowledge of statistics to the solution of engineering problems.
- the introductory knowledge of the theory of probability and the ability to apply statistical methods to design of experiments and analysis of data.
- the ability to apply statistical methods and probability to design and implement quality improvement programs
- the ability to apply statistics and probability to reliability and life testing.

7. Topics Covered: (in Order of Presentation)

- Introduction to Modern statistics and Application to Engineering (ch. 1)
- Treatment of Data, Frequency Distribution (ch. 2)
- Probability (ch. 3)
- Probability Distributions (ch. 4)
- Probability densities (ch. 5)
- Curve Fitting (ch. 11)
- Statistical Content of Quality Improvement Programs(ch. 14)
- Applications to Reliability and Life testing (ch. 15)

8. Class Schedule: Number of Sessions per week: 1
Duration of each session: 1 hour 40 minutes

9. Contribution of course to meeting the professional component:

This course is part of the lower division major requirement for the civil and mechanical engineering programs.
Mathematics 2 units

10. Relationship of course to program objectives:

This course relates to the program objectives by contributing to the following measurable outcomes at the level indicated for all engineering graduates:

Knowledge outcomes:

- an ability to apply knowledge of mathematics, science, and engineering (abet a)
- a knowledge of computer aided design and simulation software
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (abet h)
- a knowledge of measurement techniques

Skill outcomes:

- an ability to design and conduct experiments as well as to analyze and interpret data (abet b)
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (abet k)
- an ability to communicate effectively (abet g)
- an ability to think in a logical sequential process

Attitudes Outcome:

- an understanding of professional and ethical responsibility (abet f)

11. Prepared by: Maj Mirmirani

12/2005