

IE 342 – PROBABILITY AND STATISTICS FOR ENGINEERS

Designation as a 'Required' or 'Elective' course

TYPE OF COURSE: Required for BSIE Major

Course (catalog) description

COURSE DESCRIPTION: IE 342 Probability and Statistics for Engineers, 3 Hours. Probability, random variables, mathematical expectation, discrete and continuous distributions, estimation theory, test of hypotheses, and introduction to standard experimental design.

Prerequisite(s)

PREREQUISITE(S): Math 210, 3 Hours

Textbook(s) and/or other required material

SAMPLE SOURCES AND RESOURCE MATERIALS: *Probability and Statistics for Engineers and Scientists*, by R. E. Walpole, R. H. Myers, S. L. Myers and K. Ye, Eighth Edition.

Course objectives

COURSE OBJECTIVES: This course introduces students to various aspects of statistical analysis. The objective is to expose the students to elements of probability and probability distributions, and statistical inference. We try to keep a balance between theory (topics 1 to 5) and methodology (topics 6, 7 and 8). The students use differential and integral calculus to investigate different properties of random variables and their functions. They also learn how to apply statistical analysis to solve real-life problems. Many examples are used to show the applicability of the probability theory and statistical analysis.

Topics covered

MAJOR TOPICS:

	Hrs
1 Probability	8
2 Random variables and probability distributions	5
3 Mathematical expectation	5
4 Discrete probability distributions	5
5 Continuous probability distributions	5
6 Random sampling and sampling distributions	5
7 Estimation theory	4
8 Test of hypotheses	4
9 Class quizzes	2
10 Final exam	
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Total	43

Class/laboratory schedule, i.e., number of sessions each week and duration of each session

CREDIT HOURS: 3 hours

TYPE OF INSTRUCTION:

Type of Instruction	Contact Hours/Week
Lecture/Discussion	3

IE 342 Instruction Notes on Relevant ABET Outcomes:

Outcome A: An ability to apply knowledge of mathematics, science, and engineering.

Measurables: 1. Students are able to use mathematical calculations in solving engineering problems.

2. Students are able to formulate engineering problems based on scientific and engineering principles.

Instruction Notes: Use of differential and integral calculus.

Outcome B: An ability to design and conduct experiments, as well as to analyze and interpret data.

Measurables: 1. Ability to analyze, interpret and determine significant parameters to aid in understanding data

Instruction Notes: Much of the course deals with the statistical aspects of data.

Outcome E: An ability to identify, formulate, and solve engineering problems.

Measurables: 1. Ability to understand what is needed

2. Ability to formulate problems mathematically

3. Ability to build on fundamental knowledge and apply it to new situations

Instruction Notes: The homework requires the use of these capabilities.

Outcome K: An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Measurables: 1. Demonstrate knowledge of computer usage in engineering analysis

Instruction Notes: Some homework requires use of computers. The students can use Microsoft Excel or any other statistical software in their projects. Extra sessions will be held (if necessary) to demonstrate the software.

Person(s) who prepared this description and date of preparation

Elodie Adida, Assistant Professor of Industrial Engineering, September 15, 2006

These outcomes are what students are expected to gain from this course.