

BA326 –MATHEMATICS 6

CREDIT HOURS

3 Hours

CONTACT HOURS (Hours/week)

Lecture: 2; Tutorial: 2;

TEXT BOOK

Mahmoud Gaber , Probability and statistics for engineering student.

COURSE DESCRIPTION

This course provides a comprehensive knowledge about descriptive statistics and the use of computer statistical packages. Statistical methods of estimation and hypothesis testing. Emphasis on use, validity and understanding of particular statistical models. This course also introduces students to probability, conditional probability; independent event total probability, Bayes theorem and basic counting techniques and random variables. Topics include distribution functions, binomial, geometric and Poisson distributions. The other topics covered are uniform, exponential and normal distributions; joint distributions. An introduction about Random Processes: Definition and classification, stochastic integrals, Fourier transforms of random processes, stationary and non-stationary processes, correlation functions. Power spectral density, transformations of random processes by linear systems.

PREREQUISITE:

BA 124

RELATION OF COURSE TO PROGRAM

Required

COURSE INSTRUCTION OUTCOMES

The student will be able to:

- Make statistical analysis and calculating statistical measurements using computer programs like the Minitab program or Excel.
- Introduce the basic ideas of probability and conditional probability and its dependence. It is assumed that the outdone has some knowledge of elementary set theory.
- introduce discrete and continues random variable and for this need a knowledge of the simpler techniques of calculus desirable.
- introduce the joint distribution in order to study simple application to random process and signal principles.

TOPICS COVERED

- An introduction to Statistics and statistical analysis on data observation.
- Statistical measurements.
- Elementary probability-Probability theorems.

- Conditional probability-Independent and dependent events.
- Total probability rule- Bayes Theorem and enumeration methods.
- Discrete probability distribution-probability mass function.
- Continuous probability distribution -probability density function.
- Mathematical expectation, mean and variance.
- Special discrete distribution: Bernoulli, Binomial, Geometric and Poisson distributions.
- Special continuous distribution: Uniform and exponential distribution.
- Special continuous distribution: normal distribution.
- Discrete and Continuous joint probability distribution.
- Random Process: Temporal Characteristics.
- Random Process: Spectral Characteristics.

CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:

Professional component Content			
Math and Basic Sciences	Engineering Topics	General Education	Other
✓			

RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course aspects
A	An ability to apply knowledge of mathematics, science, and engineering	a ₁ a ₂
B	An ability to design and conduct experiments, analyze and interpret data.	
C	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economics, environmental, social, political, ethical, health, and safety, manufacturability, and sustainability	
D	An ability to function on multi-disciplinary teams.	
E	An ability to identify, formulate, and solve engineering problems	e ₁ e ₂ e ₃
F	An understanding of professional and ethical responsibility	
G	An ability to communicate effectively	
H	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social content	
I	A recognition of the need for, and an ability to engage in life-long learning.	
J	A knowledge of contemporary issues within and outside the electrical engineering profession.	
k	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	