

Faculty of Engineering & Technology

Probability and Statistics (Math 6)

Information :

Course Code : MTH 312

Level : Undergraduate

Course Hours : 3.00- Hours

Department : Department of Electrical Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Nashwa Mohamed El Sayed Mohamed	2
Lecturer	Nashwa Mohamed El Sayed Mohamed	2
Assistant Lecturer	TAREK ALI ABDALLAH TEAMA	2
Teaching Assistant	Doaa Nabil Sayed Mohamed Elsayed Khodair	2
Teaching Assistant	Doaa Nabil Sayed Mohamed Elsayed Khodair	2

Area Of Study :

Statistical concepts and methods are widely applied in many areas of human activities. They are extensively used in the physical, natural, and social sciences. Statistical analyses are involved in all the engineering disciplines. In many cases such analyses are helpful in making choices regarding designs, materials, procedures, technologies, or methods.

The course aims at providing the student with an understanding of the concepts and applications of basic statistical techniques and fundamental knowledge of probability used in science. A thorough grounding in these concepts allows any one to have a better understanding of statistical inference. Without some formalism in probability the student cannot appreciate the true interpretation of data analysis through modern statistical methods. It is quite natural to study probability prior to studying statistical inference. Elements of probability allow us to quantify the strength or "confidence" in our conclusions.

This course covers various topics such as Data analysis, probability concept, distributions of random variables, the central limit theorem and sampling distributions, introduction to statistical inference, , correlation and regression.

Description :

Probability: Definitions and concepts, Conditional probability, Statistical independence and Baye's theorem, Discrete and continuous random variables, Distribution functions, Probability distributions: normal, binomial, Poisson,..., Joint distributions and moments, Numerical Analysis: numerical solution of systems of linear and nonlinear algebraic equations, methods for numerical solution of ordinary differential equations (Euler, modified Euler and Runge, Kutta methods), Finite difference method for partial solutions of differential equations.

Course outcomes :

a.Knowledge and Understanding: :

1 -	Understand probabilistic problems and statistical concepts.
2 -	Define basic probability distributions and know related concepts.
3 -	Define basic statistical tools and know related models.

b. Intellectual Skills: :

1 -	Think logically and critically to analyze and solve problems.
2 -	Identify the role that statistics can play in the engineering problem-solving process
3 -	Ability of presenting a method to give an application to some theory.

c. Professional and Practical Skills: :

1 -	Use basic rules of probability to solve statistical problems.
2 -	Identify how variability affects the data collected and used for making engineering decisions.
3 -	Ability of dealing with theories and distinguishing various models.

d. General and Transferable Skills: :

1 -	The student should be able to deal with statistical package techniques and seek a connection with applied problems.
2 -	Professional attitude towards problem solving.
3 -	Ability of dealing with theories and distinguishing various methods.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Descriptive Statistics and Data Analysis	10	6	4
Introduction to Probability	10	6	4
Random Variables and Probability Distribution	10	6	4
Expected value and Variance	5	3	2
Some Important Probability Distributions	10	6	4
Sampling Methods and the central Limit Th.	5	3	2
Introduction to Estimation and Tests of Hypothesis	15	9	6
Correlation and Regression	10	6	4

Teaching And Learning Methodologies :

Presentation of course material.
Interactive questions
class exercises.

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Class Participation & Assignment	10.00	1	To assess lecture material comprehension
Final Exam	40.00	16	To assess understanding and problem solving skills
First Midterm Exam	20.00	7	To assess understanding and problem solving skills
Quizzes	10.00	2	
Second Midterm Exam	20.00	12	To assess understanding and problem solving skills

Course Notes :

handout

Recommended books :

Probability & statistics for engineers & scientists/Ronald E. Walpole . . . [et al.] 9th ed. ISBN 978-0-321-62911-1, Prentice Hall,2012.

Periodicals :

www.statcrunch.com

Web Sites :

www.statcrunch.com