



Course Specifications

Program(s) on which this course is given:	Electronics & Electrical Communications Engineering
Major or Minor element of programs:	Major
Department offering the program:	Electronics & Electrical Communications Engineering
Department offering the course:	Mathematics and Engineering Physics
Academic year / Level:	Third
Date of original/modified specification approval:	2003/
Semester of course offering:	First

A- Basic Information

1.a. Title:	Mathematics (4)			1.b. Code:	MTH317			
2. Units/Credit hours per week:	2.a. Lectures	3	2.b. Tutorial	1	2.c. Practical	0	2.d. Total	4

B- Professional Information

1. Overall Aims of the Course:	<p>At the end of this course, the student should be able to:</p> <ul style="list-style-type: none"> Perform statistical inference from data. Compute probability of errors associated with data communication. Compare between alternatives based on probability measures. Deal with some applications involving special functions. Solve different types of Partial Differential Equations (PDEs). Analyze and solve some applications using PDEs in electromagnetic waves.
2. Intended Learning Outcomes of Course (ILOs):	<p>a) Knowledge and Understanding (1.1)</p> <ol style="list-style-type: none"> Describe all possible outputs of any statistical experiment and calculate their count. Calculate the probability of any event described on a statistical experiment. Recognize the type of the random variable of any statistical experiment and calculate its different measures. Calculate different statistical measures of any function of random variables. Define and describe the basic types of PDEs. Solve different integrals using special functions. <p>b) Intellectual Skills (3.1)</p> <ol style="list-style-type: none"> Being able to describe an engineering problem as a statistical experiment and compute its different measures. Being able to change the order of multiple integration, and transform it into cylindrical or spherical coordinates Classify and solve PDEs, and solve difficult integrals using special functions. <p>c) Professional and Practical Skills (2.1)</p> <ol style="list-style-type: none"> Calculate the efficiency of production of a machine based on the number of defective products produced. Quality control of any production machine by studying the influence of its different parameters. Compare different alternatives cost-wise based on statistical data collected for each alternative. Calculate probability of errors of digital communication channels. Solving electromagnetic wave equations and find the electric and magnetic field.

		d) General and Transferable Skills	
		1. Acquire Computational and communications skills (4.2, 4.7). 2. Work in a group (4.7).	
3. Contents			
Topic	Total hours	Lectures	Tutorial/ Practical
Set Theory	6	3	1
Counting	6	3	1
Introduction to Probability	6	3	1
Conditional Probability	6	3	1
Random Variables	11	6	2
Some Discrete Random Variables	11	6	2
Some Continuous Random Variables	11	6	2
Function of Random Variables	6	3	1
Special Functions	11	6	2
Partial Differential Equations	11	6	2
4. Teaching and Learning Methods	Lectures (Y)	Practical Training/ Laboratory (N)	Seminar/Workshop (N)
	Class Activity (Y)	Case Study (Y)	Projects (N)
	E-learning (N)	Assignments /Homework (Y)	Other:
5. Student Assessment Methods			
5.a. Method		To assess (with reference to the ILOs)	
• Discussions and reports		d1, d2	
• Assignments		a1 – a6, b1 – b3, c1 – c5	
• Quizzes		a1 – a6, b1 – b3 , c1 – c5	
• Midterm		a1 – a6, b1 – b3 , c1 – c5	
• Final		a1 – a6, b1 – b3 , c1 – c5	
5.b. Assessment Schedule		Week	
• Discussion		weekly	
• Assignments and Quizzes		Bi-weekly	
• Midterm		8	
• Report		12	
• Final		15	
5.c. Weighting of Assessments			
• Assignments and reports		5%	
• Quizzes and discussion		10%	
• Midterm		15%	
• Final		70%	
• Total		100 %	
6. List of References			
6.a. Course Notes: Lecturer notes (in English).			
6.b. Essential Books (Text Books)			
• "Probability and Statistics for Engineers and Scientists" by Ronald E. WALPOLE, Raymond H. MEYERS, and			

Sharon L. MEYERS, 6th edition Prentice-Hall, 1998.	
6.c. Recommended Books.	
<ul style="list-style-type: none"> "Applied Statistics and Probability for Engineers" by Douglas C. Montgomery and George C. Runger, third edition, John Wiley & Sons, 2003 	
6.d. Periodicals, Web Sites, ... etc: N/A.	
7. Facilities Required for Teaching and Learning	
<ul style="list-style-type: none"> White board, data show, screen, projector. 	
Course Coordinator:	Prof. Dr. Ibrahim Gomaa
Head of Department:	Prof. Dr. Ahmed Alaa
Date:	