

COURSE DESCRIPTION FORM

INSTITUTION National University of Computer and Emerging Sciences (NUCES-FAST)

PROGRAM (S) TO BE BS(CS)

EVALUATED

A. Course Description

(Fill out the following table for each course in your computer science curriculum. A filled out form should not be more than 2-3 pages.)

Course Code	MT-205
Course Title	Probability & Statistics
Credit Hours	3
Prerequisites by Course(s) and Topics	Calculus-I
Assessment Instruments with Weights (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	Mid-I: 15 Mid-II: 15 Assignments/Quizzes: 20 Final: 50
Course Coordinator	Mr. Osama Bin Ajaz
URL (if any)	
Current Catalog Description	This course gives an introduction to Probability and Statistics from a computer science perspective, including many of the fundamental concepts and techniques that are most relevant to current research areas. Research in CS is fast-paced, and researchers often need to be proficient at manipulating data to draw insights and probe research questions. It will include the rudiments of probability and random variables, estimation, special distributions, sampling, hypothesis testing and regression analysis.
Textbook (or Laboratory Manual for Laboratory Courses)	“Probability & Statistics for Engineers & Scientists”, Walpole, Myers, Myers YE, 9 th Edition, Prentice Hall.
Reference Material	1) Probability & Statistics for Engineering and The Sciences, Jay L Devore 8 th Edition 2) Introductory statistics , Neil A.Weiss , 9 th Edition

Course Goals	A. Course Learning Outcomes (CLOs)					
	CLO	Course Learning Outcome (CLO) Statements	Domain	Taxonomy Level	PLO	Tools
	01	Describe the fundamental concepts in Probability & Statistics	Cognitive	02	02	A1, M1, F
	02	Analyze the data and produce probabilistic models for different problems	Cognitive	04	02	A1, M1, F, M2, A2
	03	Apply the rules and algorithms of Probability & Statistics to their relevant problems	Cognitive	03	02	A3, F
Tools: A = Assignment, M = Midterm, F=Final						
	B. Program Learning Outcomes					
	PLO 2	Problem Analysis	Identify, formulate, research literature, and analyze complex computing problems, reaching substantiated conclusions using first principles of mathematics, natural sciences, and computing sciences.	✓		

		C. Relation between CLOs and PLOs (CLO: Course Learning Outcome, PLOs: Program Learning Outcomes)														
			PLOs													
			1	2	3	4	5	6	7	8	9	10				
	CLOs	1		✓												
		2		✓												
		3		✓												
		4														
		5														
		6														
		7														
		8														
Topics Covered in the Course, with Number of Lectures on Each Topic (assume 15-week instruction and one-hour lectures)		1. Topics to be covered:														
		List of Topics					No. of Weeks		Contact Hours		CLO					
		Descriptive statistics: Basic definition, Types of variables, Mean, Median, Mode, Variance, Standard Deviation, Quartiles, Deciles, Percentiles, IQ Range Graphical representation of data: Construction of bar chart, histograms, Stem-leaf plots, box plot, ogive, frequency curve, Skewness and Kurtosis. Sample Space and Event: Sample point, tree diagram, set theory, Venn diagram. Counting techniques, Probability of an event, Additive rules					4		12		1					
		Conditional Probability, Independence and Multiplicative rules. Bayes' Rules					1		3		2					
		===== MID 1 =====														
		Concept of random variable					0.5		2		1					

	Discrete distribution, Continuous distribution, Joint distributions, marginal distributions, Mathematical Expectation, Correlation, binomial, Poisson, Normal and standard normal distributions	3.5	10	2
	Estimation, point estimate, interval estimate, confidence intervals, z and t distributions	1	3	3
	===== MID 2 =====			
	Hypothesis testing, one sample z-test, two sample z-test, one sample t-test, two sample t-tests, p-value method	2	6	3
	Scattered diagram, correlation, coefficient of determination	0.5	2	2
	Simple and multiple regression analysis	2.5	4	3
	ANOVA	1	3	3
	Total	15	45	
Laboratory Projects/Experiments Done in the Course				
Programming Assignments Done in the Course				
Class Time Spent on (in credit hours)	Theory	Problem Analysis	Solution Design	Social and Ethical Issues
	30	10	5	0
Oral and Written Communications	Every student is required to submit at least __0__ written report of typically __0__ pages and to make __0__ oral presentations of typically __0__ minute's duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.			

Instructor Name _ Osama Bin Ajaz

Instructor Signature _____