GAU, Faculty of Engineering

Course Unit Title	Engineering Statistics
Course Unit Code	IE311
Type of Course Unit	Compulsory, Industrial engineering students
Level of Course Unit	3rd Year, Core, Undergraduate(BSc)
National Credits	3
Number of ECTS Credits Allocated	7 ECTS
Theoretical (hour/week)	3
Practice (hour/week)	-
Laboratory (hour/week)	-
Year of Study	3
Semester when the course unit is delivered	5
Mode of Delivery	Face to Face, Project, E-learning activities
Language of Instruction	English
Prerequisities and co-requisities	MT207
Recommended Optional Programme Components	Calculus and Probability knowledge are recommended

Objectives of the Course:

To make the student aware of the statistical concepts, to give a general view about descriptive and inferential statistics and their usages in real world problems.

When this course has been completed the student should be able to		Assesment.
1	Explain understand the role of statisics in business and its importance in real world.	1
2	Describe and use the various aspect of statistics for research purposes.	1,2
3	Organize, present and describe the data using proper statistical tools.	1,3,5
4	Apply and use the Normal distribution in engineering problems	1,3
5	Learn and apply hypothesis testing principles about claims related with populations	1,3,5
6	Use correlation and regression methods to analyze relationships among inedpendent and dependent variables	1,3
7	Apply Chi-square method to test the pattern of many distributons and goodness-of fit.	1,3,5
8	Use and apply various tests (T test, F test etc.) to compare the mean or proportions of many populations	1,3,5

Assessment Methods: 1. Written Exam, 2. Assignment, 3. Project/Report, 4.Presentation, 5 Lab. Work

Course's Contribution to Program

		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	5
2	Ability to design and conduct experiments as well as to analyze and interpret data	5
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	3
4	Ability to apply systems thinking in problem solving and system design	3
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	3
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	4
7	Ability to express their ideas and findings, in written and oral form	4
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	3
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	3
10	Ability to design systems, processes or products by applying modern methods of work study, ergonomics, production systems and simulation while fulfilling requirements under realistic conditions	3
11	Ability to plan and improve system performance using production planning, quality planning and control, information system design and project planning techniques	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5:Very High)

Course Contents

Week		Topics	Exams
1		The Nature of Probability and Statistics	
2		Data Collection and Sampling Techniques	
3		Frequency Distributions and Graphs	
4		Organizing Data	
5		Data Description	
6		Measures of Central Tendency	
7		The Normal Distribution	
8		Applications of the normal distribution	Midterm
9		Hypothesis Testing	
10		Steps in Hypothesis Testing	
11		Correlation and Regression	
12		Multiple Regression	Quiz
13		The Chi-square Distribution	
14		The F test and Analysis of Variance	
15			Final

Recommended Sources

Textbook: Bluman G. Allan, "Elementary Statistics: A Step by Step Approach", 8e, McGraw- Hill, 2008
Supplementary Material(s): Walpole R., Myers R., "Probability and Statistics for Engineers and Scientists", 6e Prentice Hall,1998
Milton J. S., Arnold J. C., "Inytroduction to Probability and Statistics", McGraw- Hill,1995.

Assessment

Attendance & E-learning	10%	
Project	15%	
Midterm Exam (Written)	20%	
Quiz (Written)	15%	
Final Exam (Written)	40%	
Total	100%	

ECTS Allocated Based on the Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including the Exam week)	15	3	45
Labs and Tutorials	2	2	4
Assignments	-	-	-
Project/Presentation/Report Writing	14	5	70
E-learning Activities	10	1	10
Quizzes	1	6	6
Midterm Examination	1	12	12
Final Examination	1	12	12
Self Study	14	3	42
Total Workload			201
Total Workload/30 (h)			6.7
ECTS Credit of the Course			7