Course Specification
(Bachelor)

Course Title: :	Applied Statistics in Industrial Engineering
Course Code:	**INE 2331**
Program:	**Bachelor of** Industrial Engineering
Department:	Industrial Engineering
College:	Engineering
Institution:	King Khalid University
Version:	1
Last Revision Date:	17 Nov 2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (Level4/2nd year)					
4. Course general Description:					
Industrial Engineers collect data and seek knowledge for interpreting the industrial process. They do experiments and analyze them to confirm or reject hypotheses and use the results for day-to-day decision making. As the practical implementation for collected data is multidimensional requires statistical analysis in the multivariate domain. The aim is to build confidence in the students in analyzing and interpreting multivariate data.					
5. Pre-requirements for this course (if any)**:**					
STAT 1211					
6. Co-requisites for this course (if any)**:**					
NIL					
7. Course Main Objective(s):					
Industrial Engineers collect data and seek knowledge for interpreting the industrial process. They do experiments and analyze them to confirm or reject hypotheses and use the results for day to day decision making. As the practical implementation for collected data are multidimensional requires statistical analysis in the multivariate domain. The aim is to build confidence in the students in analyzing and interpreting multivariate data.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		

No	Mode of Instruction	Contact Hours	Percentage
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	-
5.	**Others (specify)**	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Learn how to organize data and represent it graphically.	K1	Lectures and tutorials	Assignments Midterm Exam Final Exam
1.2	Learn methods of test of hypotheses	K2	Lectures and tutorials	Assignments Midterm Exam Final Exam
1.3	Understanding different type of graphs and ability to demonstrate and extract important information.	K3	Lectures and tutorials	Assignments Midterm Exam Final Exam
2.0	Skills			
2.1	Apply statistical techniques to solve engineering problems	S2	Lectures and tutorials	Assignments Midterm Exam Final Exam
2.2	Develop statistical analysis experiment and test with standard values	S2	Lectures and tutorials	Assignments Midterm Exam Final Exam
2.3	Design steps using software to solve multivariate statistical models	S6	Lectures and tutorials	Assignments Midterm Exam Final Exam
3.0	Values, autonomy, and responsibility			
3.1	Work individually or within a team and communicate effectively to perform the assigned tasked (Homework/Group Project)	V4	Projects	Assignments Presentations

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.2	Communicate effectively during presentations		Lectures and tutorials	Assignments Midterm Exam Final Exam

C. Course Content

No	List of Topics	Contact Hours
1.	Descriptive Statistics	12
2.	Test of Hypotheses	13
3.	Applied Univariate Statistical Analysis, MVA	4
4.	MVA: The Organization of Data	4
5.	MVA: Data Displays and Pictorial Representations	4
6.	MVA: Statistical Distance	8
7.		
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	6 to 8 Assignments	2, 3, 4, 5, 6, 7, 8, 9	30
2.	Quiz 1	7	
3.	Quiz 2	12	
4.	one Mid Term Exam	6	30
5.	Final Exam	16	40
...			**100**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	1- Applied Statistics and Probability for Engineers 7th Edition, MEA, Douglas C. Montgomery, George C. Runger John Wiley & Sons, 2019, ISBN 10: 1119585597 **2-** Applied Multivariate Statistical Analysis, Johnson, R.A. and Wichern, D.W. Pearson, 6th Edition, 2018, **ISBN 10: 0134995392**

Supportive References	Applied Multivariate Statistical Analysis 5th ed. 2019 Edition, Wolfgang Karl Härdle, Léopold Simar . Springer, ISBN 10: 3030260054
Electronic Materials	Course page on Blackboard
Other Learning Materials	Lecture handouts

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms
Technology equipment (projector, smart board, software)	Projector, smart board, MS Excel
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (Questionnaire)
Effectiveness of Students assessment	Faculty	Direct
Quality of learning resources	Program Leaders	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**REVIEWED BY THE DEPARTMENT CURRICULUM COMMITTEE. APPROVED BY THE DEPARTMENT QUALITY COMMITTEE**
REFERENCE NO.	**9-6-47**
DATE	**25/06/1447**