The University of Jordan

School of Engineering
Chemical Engineering Department
Program: BSc
Academic Year: (2025/2026) Semester: First Semester

Process Analysis by Statistical Methods (0905302)

Credit hours	Three	Level		3rd yr	Pre-requisite	0301102
Lecturer	Prof.	Office Number			Office phone	

Office hours					
Day	Sunday	Monday	Tuesday	Wednesday	Thursday
Time					

Course Description

Introduction to probability and statistics: Fundamentals of statistical of distributions (one and two dimensions), testing hypotheses and confidence intervals, regression analysis, simple comparative experiments, experiments with a single factor, analysis of variance (ANOVA), factorial designs, two-level fraction factorial designs. Applications in chemical engineering and using available software.

Learning Objectives

In this course students will learn the basic fundamentals of probability and statistics and be able to distinguish the basic differences between them.

ABET Student Outcomes:
At the end of the course the student will be able to:

Course Objective	ABET SO
1. Apply probability theory to engineering problems	01
2. Identify various probability distributions	01
3. Use statistical techniques to solve engineering problems	06
4. Calculate basic statistical measures	01
5. Design and perform hypothesis tests	06
6. Apply basic regression techniques in an engineering context	06

Course Content:

This course is designed for Engineering at the chemical engineering department. The focus of this course is on both applications and theory. The details about the course are as follows:

Topic	Hours
Introduction: the role of statistics in engineering	1
Statistics. Basic ideas and tools for displaying and analyzing data sets.	2
Probability: Sample space and events, counting rules, conditional probability and independence, rules of probability.	6
Concepts of a random variable, probability distribution of a discrete random variable, cumulative distribution function, and mathematical expectation; Bernoulli Trials, Binomial Distribution, Geometric Distribution, Negative Binomial Distribution, Poisson Distribution.	6
Continuous random variable, its density and cumulative distribution functions; mathematical expectation, Uniform Distribution, Exponential Distribution, Gamma Distribution, Normal Distribution.	5
Sample Mean and Sample Variance, Sampling Distribution of Sample Mean, Central Limit Theorem, Normal Approximation to the Binomial Distribution, Sampling Distribution of Sample Variance.	6
Point and Interval Estimators, Confidence intervals for means, proportions and variances. Prediction intervals.	5
Testing the mean; testing the difference between two means,.	5
Hypothesis testing	5
Regression models	4

Attendance Policy:

Class attendance and participation is mandatory. University regulations will be applied. Regular attendance is essential for satisfactory completion of this course. The course is a cumulative subject and each day builds on the previous day's material. If you have too many absences, you cannot develop to your fullest potential in the course.

Makeup Policy:

Any student who misses any exam will receive a failing grade. Permission for makeup will be granted only if the student notifies the instructor in due time and presents evidence of an officially excused absence.

Mobile Policy:
Cell phones ringing in class will be confiscated until the end of the semester.

Academic Honesty Policy:

Each student is expected to be honest in his/her class work or in the submission of information to the Department. Dishonesty in classroom, on assignments and examinations, and the submission of false and misleading information is considered as a serious offense. .A student who cheats, plagiarizes, or furnishes false, misleading information is subject to disciplinary action according to University rules and regulations.

Learning Methodology
Formal lecturing covering the course content will be adopted. Discussion, problem solving, activities, student questions and student participation will enhance the conveying of knowledge to students. Drop quizzes are to be expected during the course.
In case where online or hybrid teaching is required, the material will be delivered to students through Zoom meetings which will be recorded and made available to students together with the lecture material itself on the e-learning platform adopted by the university at the following URL: elearning.ju.edu.jo/moodle10/

Assessment

Assessment Method	Points %
Quize	5
Midterm Exam	30
Exam	10
Other Activities	5

Final Exam	50

Main Reference:

Douglas Montgomery, George C. Runger, Applied Statistics and Probability for Engineers, latest Ed., John Wiley and Sons, 2011.

References:

1. Milton, J. S.; and Arnold, J. C., Introduction to probability and statistics: principles and applications for engineering and the computing sciences, Fourth Edition, McGraw-Hill, New York, 2003.
2. Devore, J. L., Probability and statistics for engineering and the sciences, Fourth Edition, Duxbury Press – ITP, California, 1995.

Intended Grading Scale: (May change slightly according to final class performance)

F	0 – 39
D⁻	40 – 46
D	47 – 50
D+	51 – 54
C⁻	55 – 58
C	59 – 62
C+	63 – 66
B⁻	67 – 70
B	71 – 74
B+	75 – 78
A⁻	79 – 84
A	85 – 100

- For more details on University regulations please visit:

  http://www.ju.edu.jo/rules/index.htm

- University Student Conduct Policy
  http://www.ju.edu.jo/Documents/%D9%85%D8%AF%D9%88%D9%86%D8%A9%20%D8%B3%D9%84%D9%88%D9%83%20%D8%A7%D9%84%D8%B7%D9%84%D8%A8%D8%A9%20.pdf

Date 21-9-2025