The University of Jordan

Accreditation & Quality Assurance Centre

Course Syllabus

Course Name:
Statistical Techniques

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Course Syllabus

1	**Course title**	Statistical techniques
2	**Course number**	0341332
3	**Credit hours**	3
	Contact hours (theory, practical)	3
4	**Prerequisites/corequisites**	0301131
5	**Program title**	B.Sc.
6	**Program code**	
7	**Awarding institution**	The university of Jordan
8	**School**	Science
9	**Department**	Mathematics
10	**Course level**	Obligatory Specialization requirement
11	**Year of study and semester (s)**	2rd year, 1st and 2nd semester
12	**Other department (s) involved in teaching the course**	none
13	**Main teaching language**	English
14	**Delivery method**	X☐Face to face learning☐Blended ☐Fully online
15	**Online platforms(s)**	☐Moodle ☐Microsoft Teams ☐Skype☐Zoom ☐Others……
16	**Issuing/Revision Date**	October 31, 2022

17 Course Coordinator:

Name:Prof. Amal Helu	Contact hours:
Office number:320	Phone number:20070
Email:a.helu@ju.edu.jo	

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18 Other instructors:

Name: Office number: Phone number: Email: Contact hours: Name: Office number: Phone number: Email: Contact hours:

19 Course Description:

Tests involve one and two treatments, Simple and multiple regression, correlation coefficient, the analysis of variance of one and two-factor experiments. Chi square test for homogeneity, independences, and goodness of fit, non-parametric statistics: One sample Wilcoxon signed rank test, paired-sample Wilcoxon signed rank test, Mann-Whiteny for two independent samples, Spearman correlation coefficient and Kruskal-Wallis Anova.

20 Course aims and outcomes:

Aims:

1. Parametric and nonparametric tests. Inference about means, proportions and variances.
2. Test of independence and goodness of fit.
3. Analysis of Variance and Regression.
4. Nonparametric Statistics.

B- Students Learning Outcomes (SLOs):

Successful completion of the course should lead to the following outcomes:

A. Knowledge and Understanding Skills: Student is expected to

A1. Know the concept of the sampling distribution of: $\bar{x}$, $(\bar{x}1 - \bar{x}2)$, $\hat{p}$, $(\hat{p}1 - \hat{p}2)$, s2 and (s21 / s2).

A2. Define the five steps in the hypothesis testing procedure, Parametric and nonparametric statistics.

A3. Asses the assumptions necessary for z-test, t-test, chi-square, ANOVA, Regression.

A4. Demonstrate the principles of a nonparametric inference.

B. Intellectual Analytical and Cognitive Skills: Student is expected to

B1. Determine when inference should be based on dependent/independent samples, parametric/ nonparametric tests.

B2. Identify situations where ANOVA is appropriate.

B3. Identify situations where Regression is appropriate.

B4. Use Minitab to make a judgement in order to validate the statistical test assumptions.

B5. Use Minitab to analyze the output of the statistical tests.

C. Subject- Specific Skills: Student is expected to

C1. Apply inferential methods related to the means, variances and proportions in Minitab and explain the outputs.

C2. Perform chi-square test, regression and ANOVA then explain the results using Minitab.

C3. Compare and contrast parametric and nonparametric tests.

D. Creativity /Transferable Key Skills/Evaluation: Student is expected to

D1. Identify the correct and appropriate statistical test for a given research questions and sets of data.

D2. Become proficient with statistical software in order to analyze data, interpret results into plain English.

21. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Statistical Inference: Significance tests The five parts of a significance test, Significance test for a mean, proportion and variance. Decisions and type of errors in tests, limitations of significance test.	1-2		A1, A2, A3, B4, B5, C1, D1, D2	Exam	
Comparisons of Two Groups Categorical data: Comparing Two Proportions. Comparing Two Variances. Quantitative data: Comparing Two Means. Comparing Means with dependent samples	3-4		A1, A2, A3, B1,B4, B5, C1, D1, D2	Exam	
One-Way Analysis of Variance Identify situations where one-way ANOVA is and is not appropriate. Test the assumptions for ANOVA. State the null and alternative hypotheses for the ANOVA test. Interpret the results of the hypothesis test. Perform a one-way ANOVA in Minitab. Perform and interpret a Tukey's pairwise comparison in Minitab.	5-7		A3, B2, B4, B5, C2, C3, D2	Exam	
Two-Way Analysis of Variance Advantages of two-way ANOVA. Test the assumptions for ANOVA. Tests involve Main effects and interactions using Minitab. Post-hock tests using Minitab.	8-9		A3, B2, B4, B5, C2, C3, D2	Exam	
Analyzing Association between Categorical Variables Contingency Tables. Chi-Squared Test of Independence. Chi-Squared Goodness of fit.	10		A3, A4, B4,B5,C2 ,D2	Exam	
Linear Regression and Correlation Linear relations. Least Squares Prediction Equation. The linear regression model. Measuring Linear Association: The correlation. Inferences for the slop and correlation. Model Assumptions and violations.	11-12		A3,B3,B 4,B5,C2, D2	Exam	
Inviting an expert from a bank or insurance company to speak to students about potential job opportunities within their field of study.	13				
Multiple Regression and Correlation Example with multiple regression using computer output. Multiple correlation and R^2.Inference for multiple regression coefficients Interaction between predictors in their effects. Comparing regression models.	13-14		A3,B3,B 4,B5,C2, D2	Exam	
Nonparametric Tests One-Sample Wilcoxon Signed Rank Test. Mann Whitney for 2 independent samples. Paired-Sample Wilcoxon Signed Rank Test . Kruskal-Wallis ANOVA.	15		A4,B1,B 4, B5,C3,D 1,D2	Exam	

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22 Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

ILO/s	Learning Methods	Evaluation Methods	Related ILO/s to the program
	Lectures Minitab lab	Exam	A1, A2, A3, B1, D2

23 Course Requirements

Minitab.

Computer and printers

Data show.

24 Course Policies:

1. All cell phones must be turned off during class at all times. Phones cannot be used during class (even as a calculator to check your answer). Earphones/buds may not be used during a quiz, test or exam. Phone texting and chatting on the web is not allowed.

2. The questions should be addressed to the instructor not to your classmate's while lecture is in progress. There is a zero-tolerance policy for disrespectful or disruptive behavior.

3. If you are late to class or need to leave early, enter and leave the room quietly.

4. Please come to class prepared to participate. Please be courteous to your class-mates and keep extra noise to a minimum.

5. Appeal of grading should be submitted in writing within 5 days of receiving the evaluation.

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6. Students are responsible for all announcements and supplements given within any

lecture.

7. Cheating and/or plagiarism will not be tolerated. Please see the University of Jordan student Handbook for definition of cheating and plagiarism, and the sever consequence of such behaviors.

8. Neither food nor drink is allowed in the classroom with the exception of bottled water.

9. No guests are allowed in class.

25 References:

Text book: Essential of Statistics for Business and Economics 7th edition by Anderson, Sweeney, Williams, Camm and Cochran.

26 Additional information:

Name of Course Coordinator: Prof. Amal Helu------Signature: A. Helu---------- Date: October 31, 2022
Head of Curriculum Committee/Department: Prof. Ahmad Al Zghoul-- Signature: --------
Head of Department: -Prof. Manal Ghanem - Signature: -M. Ghanem
Head of Curriculum Committee/Faculty: ---------- Signature: ----
Dean: Mahmoud Jaghoub Signature: ----------