جامعة الزيتونة الأردنية

Al-Zaytoonah University of Jordan

Course Syllabus

According to JORDAN National Qualification Framework (JNQF)

Course Name: selected topics in mathematics

Course Number: 0101477

General Course Information:

Course Title	Selected topics in mathematics
Course Number	0101477
Credit Hours	3 credit hours
Education Type	Traditional learning
Prerequisites/Co-requisites	Calculus 2 (0101102), Euclidean Geometry (0101231)
Academic Program	Mathematics
Program Code	
Faculty	Faculty of Information Technology
Department	Mathematics
Level of Course	4
Academic Year /Semester	2023/2024 1st Semester
Awarded Qualification	BS'c
Other Department(s) Involved in Teaching the Course	-
Language of Instruction	English
Date of Production	2021-2022
Date of Revision	16-10-2023

Course Coordinator:

Coordinator's Name	Dr. Maysoon Qousini
Office No.	128
Office Phone Extension Number	355
Office Hours	Sunday: 9:30-11 , 2-3 Monday: 11-12:30 , 2-3 Tusday: 9:30-11, 2-2:30 Wednsday:11-12:30 , 2 -2:30
E-mail	m.qousini@zuj.edu.jo

Other Instructors:

Instructor Name	
Office No.	
Office Phone Extension Number	
Office Hours	
Email	

Course Description *(English/Arabic)*:

English	In this course, we study methods of integration, integration by parts, trigonometric substitution, partial fractions to integrate functions. Also we investigate sequences and series, convergence tests, Power series, Taylor and Maclaurin series, polar coordinates, and finally concepts from Euclidean geometry
Arabic	في هذا المساق ندرس طرق التكاملات المختلفة كالتكامل بالاجزاء والتكامل بالتعويض بالاقترانات المثلثية والتكامل بالكسور الجزئية بالاضافة ندرس المتتاليات والمتسلسلات واحتبارات التقارب واخيرا نستذكر بعض المفاهيم بالهندسة الاقليدية,

Textbook: *Author(s), Title, Publisher, Edition, Year, Book website.*

Calculus, 10th edition By Howard Anton, Irl Bivens and Stephen Davis (2021).
Introduction to Geometry, Hassan Al-Zoubi, Dar Alam Al-Thaqafa 2014.

References: *Author(s), Title, Publisher, Edition, Year, Book website.*

1-CALCULUS, 10th Edition, by Finney and Thomas (2019).
2-Calculus: One and Several Variables, Salas, John Wiley, 10th Edition (2006)
3-Vector Calculus" Susan Colley. Pearson Prentice Hall, 3rd Edition (2006)

Course Educational Objectives (CEOs):

CEO1	Students should be able to apply various integration techniques, including substitution, integration by parts, partial fractions, and trigonometric integrals
CEO2	Analyze and work with sequences and series, including convergence and divergence of series, the comparison test, the ratio test, and power series. Understand Taylor and Maclaurin series and their applications.
CEO3	Represent and analyze curves using parametric equations and polar coordinates. Understand the connection between Cartesian, parametric, and polar representations of curves.
CEO4	Learn to construct basic geometric figures using a straightedge and compass, including lines, angles, and polygons.

Intended Learning Outcomes (ILO's):

Intended learning outcomes (ILOs)		**Relationship to CEOs**	**Contribution to PLOs**	**Bloom Taxonomy Levels***	**JNQF Descriptors****
K	Knowledge and Understanding				
ILO1-k	Know several methods of integration, integration by parts, trigonometric substitution ,partial fractions to integrate functions.	CEO 1	PLO1-K	Remembering	K
ILO2-k	Know how to test a series for convergence or divergence	CEO 2	PLO2-K	Analyzing	K
ILO3-k	The student's knowledge of basic theorems in the various topics of Euclidean geometry	CEO4	PLO1-K	Applying	K
ILO4-k	The student's knowledge of basic concepts of polar coordinate	CEO3			
S	Intellectual skills				
ILO5-s	Use integration by parts, trigonometric substitution ,partial fractions to integrate functions.	CEO 1	PLO6-S	Applying	S
ILO6-s	Examine the convergence of a series for convergence or divergence	CEO 2	PLO6-S	Applying	S
ILO7-s	Apply engineering models to solve various problems	CEO 4	PLO6-S	Applying	S
C	Subject specific skills				
ILO8-c	Develop the individual's ability to communicate and interact with other mathematical courses.	CEO 1 CEO 2 CEO 3	PLO11-C	Applying	C

ILO9-c	Cooperate to work effectively in the group assignments.	CEO 1 CEO 2 CEO 4	PLO11-C	Applying	C
D	Transferable skills:				
ILO10-d					

***Bloom Taxonomy Levels:**						
Level #	1	2	3	4	5	6
Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

**** Descriptor (National Qualification Framework Descriptors): K: Knowledge, S: Skill, C: Competency.**

Program Learning Outcome (PLOs):

	(PLOs)	JNQF Descriptors**		
		K	S	C
1.	Knowledge of the main concepts in pure mathematics.	√		
2.	Knowledge of the main concepts in applied mathematics.	√		
3.	Explain concepts, principles and theories in the fields of probability and statistics.	√		
4.	Possession of technological culture related to the fields of mathematics and its applications.	√		
5.	Making use of mathematical logic in practical life.	√		
6.	Engaging scientific methodology as a way of thinking and as a tool in facing problems.		√	
7.	Applying mathematical software packages in problem solving.		√	
8.	Being capable of data analysis.		√	
9.	Capability of teaching according to modern educational techniques.		√	
10.	Develop creative and innovative methods of teaching mathematics.			√
11.	Showing the ability to work under ethical and professional standards within teams.			√
12.	Gaining critical thinking and scientific research skills.			√

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule *(please choose the type of teaching)*

- **Face to Face (F2F)**
- **Hybrid** *(One – To - One)*
- **Online**

Schedule of Simultaneous and their Topics:

Week	First Lecture (F2F)	First Lecture (F2F)	ILOs	PLOs	JNQF Descriptors*
1	Integration by Parts	Solving exercises.	ILO1-k	PLO1-K	K
2	Trigonometric Integrals	Integration by Trigonometric Substitutions	ILO1-k	PLO1-K	K

3	Solving exercises.	Integration by Partial Fractions	LO5-s	PLO6-s +	S
4	Improper Integrals	Solving exercises.	ILO5-s	PLO7-s +	S
5	Sequences and series	Geometric series	ILO2-k	PLO2-k	K
6	Integral test. Ratio and root test.	Comparison Test. Limit comparison test.	ILO6-K	PLO6-S	S
7	Power series.	Solving exercises	ILO6-K	PLO7-S	S
Midterm Exam (30%)					
9	Taylor and Maclaurin series.	Solving exercises	ILO6-S	PLO7-S	S
10	Polar coordinates.	Graphs in polar coordinates	ILO4-S	PLO4-S	K
11	Similar triangles and polygons, The basic similarity theorems	Similar triangles and polygons, The basic similarity theorems	ILO3-S	PLO6-S	S
12	Similarity of right triangles, Pythagoras theorem	Similarity of right triangles, Pythagoras theorem	ILO3-S	PLO6-S	**S**
13	Circles, Arcs of circles	Circles, Arcs of circles	ILO7-s	PLO6-S	S
14	Tangents of a circle	Four sides circular polygon, Intersecting of two circles	ILO8-c	PLO11-C	C
15	**Projects Discussion**				
16	**Final Exam**				

* **K: Knowledge, S: Skills, C: Competency**

Teaching Methods and Assignments:

- Development of ILOs is promoted through the following teaching and learning methods:
- Lecture.
- learning through problem solving.

Course Policies:

A- Attendance policies:
The maximum allowed absences is 15% of the lectures.
B- Absences from exams and handing in assignments on time:
Midterm exam can be retaken based on approval of excuse by the instructor's discretion.
Not handing assignment on time will incur penalties.
C- Academic Health and safety procedures
D- Honesty policy regarding cheating, plagiarism, and misbehaviour:
Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.
E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Discussion Forums, Quizzes) **20%**
- Midterm 30**%**
- Final Exam 50**%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required Equipment:

- PC / Laptop with webcam and mic
- Internet Connection
- Access to the ZUJ E-Learning Platform at https://exams.zuj.edu.jo/
- E-learning plan
- Satisfaction questionnaires for online and face-to-face learning

Assessment Tools Implemented in the Course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework

Responsible Persons and their Signatures:

Course Coordinator	Dr. Maysoon Qousini	**Completed Date**	**October 2023**
		Signature	
Received by (Department Head)		**Received Date**	/ /
		Signature	