



مركز الاعتماد
وإضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Centre

Course Syllabus

Course Name: Mathematics lab

Course Syllabus

1	Course title	Mathematics Lab
2	Course number	0301273
3	Credit hours	2
	Contact hours (theory, practical)	2
4	Prerequisites/corequisites	0301201
5	Program title	B.Sc. in Mathematics
6	Program code	
7	Awarding institution	The University of Jordan
8	School	Science
9	Department	Mathematics
10	Course level	Bachelor
11	Year of study and semester (s)	2022/2023
12	Other department (s) involved in teaching the course	B.Sc. in Mathematics
13	Main teaching language	English
14	Delivery method	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online
15	Online platforms(s)	<input checked="" type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....
16	Issuing/Revision Date	Oct 2022

17 Course Coordinator:

Name: Dr. Banan Maayah

Contact hours:

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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:

A mathematical software is used in a computer lab to illustrate selected mathematical concepts, explore some mathematical facts, build algorithms for problem solving cases, do numerical and analytical computations, do simulation studies and plot graphs. The selected topics can cover a range of mathematical topics from basic algebra and trigonometry, calculus, probability and statistics. The course starts with training on using the package and ends with writing computer programs to solve some specific mathematical problems.

20 Course aims and outcomes:

A- Aims:

1. Develop a fundamental understanding of mathematical packages.
2. Solve mathematical problems using mathematical packages.

B- Students Learning Outcomes (SLOs):

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

SLOs SLOs of the course	SLO (1)	SLO (2)	SLO (3)	SLO (4)
1	Understand and apply commands used in mathematical packages.	Apply appropriate statements and commands relevant to mathematical modelling	Plan and design applications using mathematical packages.	Deal with an appropriate data relevant to mathematical packages.
2	Identify the steps required to carry out a piece of research on a topic using mathematical packages.	Demonstrate a reasoned argument to the solution of problems using mathematical packages.	Plan and design a piece of independent research using mathematical packages.	Solve mathematical models using mathematical packages

21 . Topic Outline and Schedule:

Week	Topic	Student Learning Outcome	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1. Introduction: front-end interface, kernel, menus and pallets.	(1)1, (1)2				Exam/ Assignment
2	2. Mathematica as a calculator, numbers, symbolic algebraic and trigonometric computations.	(1)1, (1)2				Exam/ Assignment
3	3. The structure of Mathematica commands, arguments (compulsory)	(1)1, (1)2				Exam/ Assignment

	and optional). Variables and constants, assignments, recursive functions.					
4	4. Lists: functions producing lists, functions and operations on lists. Heads, Domains and Predicates. List filtering using Cases and Select.	(2)1, (2)2				Exam/ Assignment
5	5. Logic and set theory: logical connectives, operations on set, Append, AppendTo, Prepend, and PrependTo, handling sets.	(2)1, (2)2				Exam/ Assignment
6	6. If and Which. Functions with multiple definitions. Sums and products.	(3)1, (3)2				Exam/ Assignment
Week	Topic	Student Learning Outcome	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
7	7. Loops: Do, For , While, and IfGoto[Label]. Break and Continue.	(3)1, (3)2				Exam/ Assignment
8	8. Nest, NestList. Fold, FoldList. NestWhile, NestWhileList , FoldWhile.And FoldWhileList.	(3)1, (3)2				Exam/ Assignment
9	9. Modules and blocks.	(3)1, (3)2				Exam/ Assignment
10	10. Graphics (2dimensional): Primitives and Directives. Cartesian and polarplots. Plotting functions, parametric curves, equations and regions.	(3)1, (3)2				Exam/ Assignment
11	11. Graphics 3D: Primitives and Directives. Cartesian, Spherical and Cylindrical plots. Plotting functions, parametric curves and surfaces, 3D equations and solids.	(3)1, (3)2				Exam/ Assignment
12	12. Single and multi-	(4)1,				Exam/



& 13	variable calculus, limits, differentiation and integration , areas and volumes. Optimization. Ordinary and partial differential equations with/without initial and/or boundary conditions.	(4)2				Assignment
Week	Topic	Student Learning Outcome	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
14	13. Solving algebraic and non-algebraic equations. Basic number theoretic functions and commands. Solving number theoretic equations. Arrays and matrices. Nonlinear and linear equations and systems.	(4)1, (4)2				Exam/ Assignment
15	14. Statistics and probability. Inferential statistics. Data fitting.	(4)1, (4)2				Exam/ Assignment

22 Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform

23 Course Requirements

A well-equipped computer lab.



24 Course Policies:

1. Attendance is absolutely essential to succeed in this course. You are expected to attend every class; please notify your instructor if you know you are going to be absent. All exams must be taken at the scheduled time. Exceptions will be made only in extreme circumstances, by prior arrangement with the instructor.
2. If a student is absent for more than 10% of lectures without an excuse of sickness or due to other insurmountable difficulty, then he/she shall be barred from the final examination also he/she will get a failing grade in this course.
3. Medical certificates shall be given to the University Physician to be authorized by him. They should be presented to the Dean of the Faculty within two weeks of the student's ceasing to attend classes.
4. Test papers shall be returned to students after correction. His/her mark is considered final after a lapse of one week following their return.
5. Solutions for the exams will be posted at the teaching webpage of the instructor.
6. Cheating is prohibited. The University of Jordan regulations on cheating will be applied to any student who cheats in exams or on homework.

25 References:

A- Required book(s), assigned reading and audio-visuals:

Lecture notes and handouts.

Roosbeh, H. (2015). *Mathematica: a problem centered approach*, 2nd Edition, Springer, Germany.

B- Recommended books, materials, and media:

1. Wolfram, S. (2017). *An elementary Introduction to the Wolfram Language*, 2nd Edition, USA.

2. Don, E. (2009). *Schaum's Outlines: Mathematica*, 2nd Edition.

3. Mathematica help: documentation center



26 Additional information:

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Name of Course Coordinator: Banan Maayah --Signature: ----- Date: 8-11-2022-
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: -----