



مركز الاعتماد
وإضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

Course Name:

Ordinary Differential Equations I

Course Syllabus

1	Course title	Ordinary Differential Equations I
2	Course number	(0301221)
3	Credit hours	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	(0301102)
5	Program title	B.Sc.
6	Program code	
7	Awarding institution	The University of Jordan
8	School	Science
9	Department	Mathematics
10	Course level	College requirement
11	Year of study and semester (s)	all Semesters
12	Other department (s) involved in teaching the course	None
13	Main teaching language	English
14	Delivery method	<input checked="" type="checkbox"/> Face to face learning <input checked="" type="checkbox"/> Blended <input type="checkbox"/> Fully online
15	Online platforms(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....
16	Issuing/Revision Date	10 October 2022

17 Course Coordinator:

Name: Dr.I.Komashynska	Contact hours: 8:30 – 9:30 and 10:30-11:30 (Sun, Tue, Thu)
Office number: 328	Phone number:22102
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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:

Classification: Solutions of differential equations (first order, second order, and higher orders) with applications to mechanics and physics, series solutions, Laplace transform method.

20 Course aims and outcomes:

A- Aims:

1. Model some real- life problems using ODEs.
2. Solve some special types of ODEs, such as first order ODEs, Higher order Linear ODEs with constant coefficients, Cauchy- Euler ODEs.
3. Use series solutions to solve ODEs.
4. Use Laplace transforms to solve ODEs.

B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

SLOs SLOs of the course	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)	SLO (8)
1 Master the basic concepts of ordinary differential equation (ODE).	•						•	
2 Derive mathematical model containing ODE of a real-life problems	•	•			•		•	•
3 Select proper procedure to solve a given ODE and solve it	•						•	•
4 Find series solution of 2nd order linear differential equations.	•						•	
5 Find Laplace transform and the inverse Laplace transform of given functions. Solve the IVP by using Laplace transform	•						•	

21. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1. Introduction								
1	1.1	Definition of a D.E. and its solution, Classification of a D.E according to order, and linearity. Prob. 1-20	1, 7	Face to Face			Exams, Quizzes & Assignments	Textbook
2. 1st order D. E								
2-4	2.1	Linear and integrating factors. Prob. 1-22, 28	1,2,5,7, 8	Face to Face			Exams, Quizzes & Assignments	Textbook
	2.2	Linear prob. 1-20, 37*-41 (Bernoulli equations)		Face to Face				
	2.3	Separable equations. Prob. 1-21		Blended	Teams	Synchronous		
	2.4	Modeling with linear-equations prob. 1-6, 15-28		Face to face				
	2.5	Some problems in Mechanics prob. 1-16		Face to Face				
	2.6	Exact equations Integrating factors. Prob. 1-23		Face to Face				
	2.7	Homogeneous equations. Prob. 1-12, 15*-17 (Linear coefficients)		Blended	Moodle	Online		
	2.8	Miscellaneous problems 1031, 36*-41 (Orthogonal trajectories)		Blended	Moodle	Online		
3. 2nd order linear D.E								
5-6	3.1	Hom. Equations with constant coefficients. Prob. 1-22, 28*-43 (Equations with non-constant coefficients with y or x missing)	1,2,5,7, 8	Blended	Teams	Synchronous	Exams, Quizzes &	Textbook

7	3.2	Fundamental solutions, the Wronskian		Face to Face			Assignments	
	3.3	Complex roots of the Char. Eq'n. prob. 1-14, 38*-42 (Euler equation)		Face to Face				
	3.4	Repeated roots & Reduction of order. Prob. 1-14, 41*, 42* (Euler equation)		Blended	Teams	Synchronous		
	3.5	Non-hom. Equations: Method of undetermined coefficients. Prob. 1-26		Face to Face				
	3.6	Variation of parameters. Prob. 1-20		Face to Face				
	3.7	Mechanical and electrical vibrations Prob. 1-20		Blended	Moodle	Online		
	3.8	Forced vibrations. Prob. 1-12.		Face to Face				
4. Higher order D.E.								
8-9	4.1	General theory. Prob. 1-18	1,2,5,7,8	Face to Face			Exams, Quizzes & Assignments	Textbook
	4.2	Homo. Eq'ns with constant coefficients. Prob. 1-28		Blended	Teams	Synchronous		
	4.3	Method of undetermined coefficients. Prob. 1-17		Face to Face				
	4.4	Variation of parameters. Prob. 1-4 *add – Given a sol'n, find the d.e. that has a sol'n as the given.		Face to Face				
	4.5	Invited speaker: Application of ODEs in real-life physical problems	2,5	Face to face				
5. Series solutions of 2nd order D.E.								
10-12	5.1	Review of power series. Prob. 1-22	2,7	Blended	Moodle	Online	Exams, Quizzes & Assignments	Textbook
	5.2	Series solution near an ordinary point. Prob. 1-19		Face to Face				
	5.3	Regular singular points. Prob. 1-18		Face to Face				
	5.4	Euler equations. Prob. 1-16, 24-29		Blended	Teams	Synchronous		
	5.5	Series solution near a regular singular point, I. Prob. 1-11		Face to Face				
	5.6	Series solution near a regular singular point, II. Prob. 1-16		Face to Face				



13-15	6. Laplace transform						
	6.1	Definition of Laplace transform. Prob. 1-20	1,7,8	Face to Face			Exams, Quizzes & Assignments
	6.2	Solution of I. V. P. by Laplace transform. Prob. 1-23		Face to Face			
	6.3	Step functions. Prob. 1-25		Blended	Teams	Synchronous	
6.4	Differential eq'ns with discontinuous coefficients. Prob. 1-13	Face to Face					
							Textbook

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
Midterm exam	30	1-4	1,7,8	7	On Campus
Assignments	10	2-4	2,5	During semester	On Campus
Quizzes	20	2-5	1,7,8	During semester	On Campus
Final exam	40	All topics	1,7,8		On Campus

23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc):

Data Shows
Computers
Internet



24 Course Policies:

A- Attendance policies:

Attendance is 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

B- Absences from exams and submitting assignments on time:

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

C- Health and safety procedures:

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.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Cheating is prohibited. The University of Jordan regulations on cheating will be applied to any student who cheats in exams or on homework.

E- Grading policy:

Solutions for the exams questions and marks will be announced at the webpage of the instructor, Test papers shall be returned to students after correction. His/her mark is considered final after a lapse of one week following their return

25 References:

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

Elementary Differential Equation, By: W. E. Boyce and R.C. Di Prima 7th. ed.

B- Recommended books, materials, and media:

- (1) Elementary Differential Equations with boundary value problem by C. H. Edwards, R. and David E. Penney, 3rd ed.
- (2) Introduction to Differential Equations, by R. K. Miller. Latest ed.
- (3) A first course in Differential equations with Applications, 4th ed by Dennis G Zill



26 Additional information:

Name of Course Coordinator: Dr.I.Komashynska	Signature: -----	Date: 10.10.2022
Head of Curriculum Committee/Department: -----	Signature: -----	---
Head of Department: -----	Signature: -----	-
Head of Curriculum Committee/Faculty: -----	Signature: -----	-
Dean: -----	Signature: -----	