The University of Jordan

الجامعة الاردنية

Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2/3/24/2022/2963 05/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	2/3/24/2023
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	Number of Pages	08

1.	Course Title	**Calculus 3**
2.	Course Number	0301201
3.	Credit Hours (Theory, Practical)	3
	Contact Hours (Theory, Practical)	3
4.	Prerequisites/ Corequisites	0301102
5.	Program Title	BSc. Mathematics
6.	Program Code	
7.	School/ Center	Science
8.	Department	Mathematics
9.	Course Level	Compulsory Specialization Requirement
10.	Year of Study and Semester (s)	2nd year, 1st semester
11.	Other Department(s) Involved in Teaching the Course	None
12.	Main Learning Language	English
13.	Learning Types	■Face to face learning □Blended □Fully online
14.	Online Platforms(s)	■Moodle ■Microsoft Teams
15.	Issuing Date	10-10- 2024
16.	Revision Date	

17. Course Coordinator:

Name: Omar AbuGhneim   Contact hours: 10:30-11:30 (Su, Tue, Thu)

Office number: Math. Building Office 329   Phone number: 06-5355000 Ex. 22103

Email: o.abughneim@ju.edu.jo

18. Other Instructors:

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

19. Course Description:

As stated in the approved study plan.

Three dimensional space and vectors rectangular coordinates in 3-space; spheres, cylindrical surfaces; quadric surfaces; vectors: dot product, projections, cross product, parametric equations of lines. planes in 3-spaces; vector -valued functions: calculus of vector valued functions, change of parameters, arc length, unit tangent and normal vectors, curvature, functions of two or more variable: domain, limits, and continuity; partial derivatives; differentiability; total differentials; the chain rule; the gradient; directional derivatives; tangent planes; normal lines; maxima and minima of functions of two variables; Lagrange multipliers; multiple integrals: double integral, double integrals in polar coordinates; triple integrals; triple integrals in cylindrical and spherical coordinates; change of variables in multiple integrals; Jacobian .

20. Program Student Outcomes (SO's):

(To be used in designing the matrix linking the intended learning outcomes of the course with the intended

learning outcomes of the program)

1. Identify, formulate, and solve broadly-defined technical or scientific problems by applying knowledge of Mathematics and Science and/or technical topics to areas relevant to the discipline.
5. Reflect the impact of technical and/or scientific solutions in economic, environmental, and societal contexts.
8. Utilize techniques, skills, and modern scientific tools such as mathematical packages, statistical software, graphing calculators, and online resources necessary for professional practice.

21. Course Intended Learning Outcomes (CLO's):

(Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

1. Recognize the three dimensional space. Know vectors which are quantities with magnitude and direction. Imagine the three dimensional space, and solids. Write equations of lines and planes with a vector help. Name and sketch cylinders and quadric surfaces.
2. Find the curvature of a curve and the three unit vectors.
3. Represent problems using three dimensional space and several variable functions. Calculate limits of several variable functions. Differentiate functions of several variables, and use the chain rule. Calculate the directional derivatives, and find the maximum and minimum values of functions in two variables.
4. Evaluate double and triple integrals

Course CLOs	The learning levels to be achieved					
	Remembering	**Understanding**	**Applying**	**Analysing**	**Evaluating**	**Creating**
1	●	●	●		●	
2			●		●	
3		●	●	●	●	●
4		●	●		●	

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program SO's Course CLO's	SO (1)	SO (2)	SO (3)	SO (4)	SO (5)	SO (6)	SO (7)	SO (8)
CLO (1)	●			●				●
CLO (2)	●							
CLO (3)	●			●				
CLO (4)	●							

23. Topic Outline and Schedule:

Week	Lecture	Topic	CLO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1	1.1	Three-dimensional coordinate systems	1	FF	Teams	S	Exams	Text Book
	1.2	Three-dimensional coordinate systems	1	FF	Teams	S	Exams	Text Book
	1.3	Vectors	1	FF	Teams	S	Exams	Text Book
2	2.1	The dot product	1	FF	Teams	S	Exams	Text Book
	2.2	The cross product	1	FF	Teams	S	Exams	Text Book
	2.3	The cross product	1	FF	Teams	S	Exams	Text Book
3	3.1	Equations of lines and planes	1	FF	Teams	S	Exams	Text Book
	3.2	Equations of lines and planes	1	FF	Teams	S	Exams	Text Book
	3.3	Equations of lines and planes	1	FF	Teams	S	Exams	Text Book

4	4.1	Equations of lines and planes	1	FF	Teams	S	Exams	Text Book
	4.2	Cylinders and quadric surfaces	1	FF	Teams	S	Exams	Text Book
	4.3	Cylinders and quadric surfaces	1	FF	Teams	S	Exams	Text Book
5	5.1	Vector functions and space curves	2	FF	Teams	S	Exams	Text Book
	5.2	Vector functions and space curves	2	FF	Teams	S	Exams	Text Book
	5.3	Derivatives and integrals of vector functions	2	FF	Teams	S	Exams	Text Book
6	6.1	Arc length and curvature	2	FF	Teams	S	Exams	Text Book
	6.2	Arc length and curvature	2	FF	Teams	S	Exams	Text Book
	6.3	Arc length and curvature	2	FF	Teams	S	Exams	Text Book
7	7.1	Functions of several variables	3	FF	Teams	S	Exams	Text Book
	7.2	Limits and continuity	3	FF	Teams	S	Exams	Text Book
	7.3	Limits and continuity	3	FF	Teams	S	Exams	Text Book
8	8.1	Partial derivatives	3	FF	Teams	S	Exams	Text Book
	8.2	Tangent planes and linear approximation	3	FF	Teams	S	Exams	Text Book
	8.3	Tangent planes and linear approximation	3	FF	Teams	S	Exams	Text Book
9	9.1	The chain rule	3	FF	Teams	S	Exams	Text Book
	9.2	The chain rule	3	FF	Teams	S	Exams	Text Book
	9.3	Directional derivatives and the gradient vector	3	FF	Teams	S	Exams	Text Book
10	10.1	Directional derivatives and the gradient vector	3	FF	Teams	S	Exams	Text Book
	10.2	Maximum and minimum values	3	FF	Teams	S	Exams	Text Book
	10.3	Maximum and minimum values	3	FF	Teams	S	Exams	Text Book
11	11.1	Maximum and minimum values	3	FF	Teams	S	Exams	Text Book

	11.2	Lagrange multipliers	3	FF	Teams	S	Exams	Text Book
	11.3	Lagrange multipliers	3	FF	Teams	S	Exams	Text Book
12	12.1	Iterated integrals	4	FF	Teams	S	Exams	Text Book
	12.2	Double integrals over general regions	4	FF	Teams	S	Exams	Text Book
	12.3	Double integrals over general regions	4	FF	Teams	S	Exams	Text Book
13	13.1	Double integrals over general regions	4	FF	Teams	S	Exams	Text Book
	13.2	Double integrals in polar coordinates	4	FF	Teams	S	Exams	Text Book
	13.3	Double integrals in polar coordinates	4	FF	Teams	S	Exams	Text Book
14	14.1	Triple integrals	4	FF	Teams	S	Exams	Text Book
	14.2	Triple integrals	4	FF	Teams	S	Exams	Text Book
	14.3	Triple integrals in cylindrical coordinates	4	FF	Teams	S	Exams	Text Book
15	15.1	Triple integrals in cylindrical coordinates	4	FF	Teams	S	Exams	Text Book
	15.2	Triple integrals in spherical coordinates	4	FF	Teams	S	Exams	Text Book
	15.3	Triple integrals in spherical coordinates	4	FF	Teams	S	Exams	Text Book

24. Evaluation Methods:

Opportunities to demonstrate achievement of the CLOs are provided through the following

assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	CLO/s Linked to the Evaluation activity	Period (Week)	Platform
First Exam	20	Ch. 12	1	5	On Campus
Midterm	30	Ch. 13+ Ch. 14	2+3	11	On Campus
Final Exam	50	Ch. 12 + Ch. 13 Ch. 14+ Ch. 15	1+2+3+4		On Campus

25. Course Requirements:

Each student must have:

- Account on Microsoft Teams

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

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27. References:

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

James Stewart (2016) Calculus (Early Transcendentals), 8th Edition (or later), Thomson, Metric international version, Canada.

B- Recommended books, materials, and media:

(1) G. Thomas (2005) Calculus, 11th edition, Addison Wesley (PersonEducation).

(2) R. Smith and R. Minton (2007) Calculus, 3 rd edition, McGrawHill.

(3) Howard Anton, IrlBivens and Stephen Davis (2005) Calculus, 8th edition, John Wiley and sons Inc., New York

28. Additional information:

	Signature:	Date:
Name of the Instructor or the Course Coordinator: **Prof. Omar AbuGhneim**	Signature: ………………………	Date: 11-10-2024
Name of the Head of Quality Assurance Committee/ Department **Prof. Manal Ghanem**	Signature: ………………………	Date: ………………
Name of the Head of Department **Prof. Baha Alzalg**	Signature: ………………………	Date: ………………
Name of the Head of Quality Assurance Committee/ School of Science **Prof. Emad A. Abuosba**	Signature: ………………………	Date: ………………
Name of the Dean or the Director **Prof. Mahmoud I. Jaghoub**	Signature: ………………………	Date: ………………