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جامعة العلوم التطبيقية الخاصة
APPLIED SCIENCE PRIVATE UNIVERSITY

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Course Syllabus
Faculty of -Arts & Science
Academic Department - Basic science and humanities
Academic Year 2021 / 2022 Semester: Second

Course Title :	Calculus 2
Course No. :	1501210
Prerequisite :	1501110
Concurrent :	none
Department :	Basic science and humanities
Coordinator :	Dr. Mona Khandakji
Mode of Instruction	<u>On-Compas</u> - 3 hours in-class (Synonym) learning

*** Instructor:**

Lecturer	Office Phone	Room No.	Office Hours	E-mail
Dr.Mona Khandakji,	216	1405	Sun-Tue:10-12 Mon-Wed:11-12	m_khandakji@asu.edu.jo

*** Course Description:**

This course is a continuation for Calculus I. The course begins with Techniques of integration and it is given as: integration by parts, trigonometric integrals, trigonometric substitutions, partial fractions, rationalizations, half-angle substitution, and improper integrals. Then some applications of definite integrals are given such as: areas between two curves, volumes by washers and cylindrical shells, arc length, and area of a surface. The concept of infinite series is introduced, and then tests of convergence are given. Power series, Maclaurin and Taylor

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expansions are given. Then differentiation and integration of power series are given. Finally, polar coordinates, graphs in polar coordinates, and areas in polar coordinates are given

*** Learning Outcomes :**

Upon completion of the course, this module should lead to the following learning outcomes:

A. Knowledge and Understanding (student should):

- A1. Compute integrals using various techniques including the methods of substitution, integration by parts, trigonometric substitution, and partial fractions
- A2. Recognize an improper integral and determine whether it is convergent or divergent.
- A3. Use integration to find the volume of solids of revolution, the area of surface of revolution and the arc length of graphs of a function.
- A4. Verify the convergence or divergence of a sequence by employing appropriate tools, and find or estimate the limit of a convergent sequence.
- A5. Find the Taylor and Maclaurin series representations of a function and determine the interval of convergence.
- A6. The ability to represent functions using power series and solve problems using these representations
- A7. Demonstrate knowledge of finding polar coordinates and polar graphs. And Find the area and arc length using this coordinates.

B. Cognitive and Intellectual Skills :

- B1. Develop depth and breadth in mathematical knowledge essential to the programs, and develop confidence in problem solving skills.
- B2. Know fundamental concepts of calculus.
- B3. Read and understand mathematical language and symbols.

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B4. Apply mathematical concepts and techniques to solving applied problems.

C. Subject specific skills :

C1. Understand and apply various advanced integration techniques.

C2. Find out whether given series converges or not, and to find and to use power series expansions of functions.

D. Transferable Skills :

D1. Encourages students to wrestle with basic theoretical concepts as well as apply results to mathematical problems.

D2. Using mathematical reasoning.

Program Learning Outcomes (PLOs):

1. -----
2. -----
3. -----
4. -----
5. -----

Course Learning Outcomes Alignment Matrix				
	CLO. 1	CLO. 2	CLO. 3	CLO. 4
PLO.1:	-	-	-	-
PLO 2:	-	-	-	-
PLO.3:	-	-	-	-
PLO.4:	-	-	-	-
PLO. 5	-	-	-	-



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*** Course Contents and Schedule:**

Week	Day and Date	Topics to be covered	Method of instruction	CLOs	PL Os
1	Sun. 6/3/2022	4.5 Integration by substitution 1, 3, 5, 7, 10, 14, 16, 22, 25, 67, 69, 70, 71, 73, 75, 77, 79, 81	lecture In-class	A1,,B1,B4 , C1, D1	-
	Tues. 8/3/2022				
	Thurs. 10/3/2022				
2	Sun. 13/3/2022	7.1 Integration by parts, 1,2,4,8,9,10,13,16,15,17,21,22,23,30,33,36,38,41,44,45	lecture In-class	A1,,B1,B4 , C1, D1	-
	Tues. 18/3/2022				
	Thurs. 17/3/2022				
3	Sun. 20/3/2022	7.2 Trigonometric Integrals 1,2,3,6,7,10,11,13,15,19,21,32,22,38,42,43,44,47,48	lecture In-class	A1,,B1,B4 , C1, D1	-
	Tues. 22/3/2022				
	Thurs. 24/3/2022				
4	Sun. 27/3/2022	7.2 Trigonometric Integrals 1,2,3,6,7,10,11,13,15,19,21,32,22,38,42,43,44,47,48	Lecture In-class	A1,,B1,B4 , C1, D1	
	Tues. 29/3/2022				
	Thurs. 31/3/2022				
5	Sun. 3/4/2022	7.3 Trigonometric Substitutions 1,2,3,5,6,13,16,18,19,23,24,25,31,32	lecture In-class	A1,,B1,B4 , C1, D1	-
	Tues.5/4/2022				
	Thurs. 7/4/2022				
6	Sun. 10/4/2022	7.4 Integration of Rational Functions by Partial Fraction 1,6,7,9,12,17,18,25,26,28,29,34,47,48,51,52 Special Substitutions (Rationalizations and half-angle substitutions) 39-46,58-61	lecture In-class	A1,,B1,B4 , C1, D1	-
	Tues.12/4/2022				
	Thurs. 14/4/2022				
7	Sun. 17/4/2022	7.5 Strategy for integration	lecture In-class	A2,,B2,C1 , D2	-
	Tues. 19/4/2022				

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	Thurs. 21/4/2022	1,3,7,8,9,10,18,21,22,23,24,32,35,4 6,47,49,52,57,62,75. 7.8 Improper Integrals 1,2,3,5,6,7,11,14,26,27,28,31,32,38 ,39			
8	Sun. 24/4/2022	6.1 Areas between two curves. 1-4,5,6,9,13,14,16,20,23,29 6.2 Volumes 1,2,5,6,7,9,19-30,31,32,41- 44,49,50,51,53,56,60,61	Lecture In-class	A3,B2,C2, D1	
	Tue. 26/4/2022				
	Thu. 28/4/2022				
9		Eid Alfeter Holiday			
10	Sun. 8/5/2022	6.3 Volumes by Cylindrical shells 3,4,5,7,8,9,10,13,15,17,21,24,25,29 ,30,31,37,41	lecture In-class	A3,B2,C2, D1,D2	-
	Tue. 10/5/2022				
	Thu. 12/5/2022				
11	Sun. 15/5/2022	8.1 Arc. length 1,2,3,5,6,7,10,11,13,14,18,10,33,35 ,41 8.2 Area of a surface of revolution. 1,2,4,5,7,10,11,13,15,16	lecture In-class	A3,B2,C2, D1,D2	-
	Tue. 17/5/2022				
	Thu. 19/5/2022				
12	Sun. 22/5/2022	11.1 Sequences 3,5,7,9,10,12,13,15,17,19,27,28,35, 36,39,40,41,43,47,51,61,64,66 11.2 Series 3,6,7,11,13,15,16,21,22,29,30,31,3 5,38,40,41,55	lecture In-class	A4,B2,C2, D2	-
	Tue. 24/5/2022				
	Thu. 26/5/2022				
13	Sun. 29/5/2022	11.3 Integral Test. 3,4,5,7,8,9,11,17,21,26,27 11.4 Comparison test and limit comparison test 3,4,5,8,9,13,24,27,29,31,32 11.5 Alternating Series 2,3,4,6,7,11,13,19,20 11.6 Ratio and Root tests and Absolute convergence 2,3,4,7,12,15,18,19,21,22,23,25,27	lecture In-class	A4,B2,C2, D2	-
	Tue. 31/5/2022				
	Thu. 2/6/2022				

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		11.7 Strategy for testing Series. 1,2,5,7,9,11,12,14,15,23,27,32,33,34,35,37			
14	Sun. 5/6/2022 Tue. 7/6/2022 Thu. 9/6/2022	11.8 Power Series. 3,4,6,7,15,19,20,24,25 11.9 Representation of functions as power series. (Differentiation and Integration of power series). 3,4,5,6,8,11,13,14,15,16,23,25,27 11.10 Taylor and Maclaurin series. 1,3,4,5,6,8,11,13,15,19,25,28,29,33,35,47,48,55,56,63,65,67,68	lecture In-class	A5,A6, B4, D2	-
15	Sun. 12/6/2022 Tue. 14/6/2022 Thu. 16/6/2022	10.3 Polar Coordinates 1,3,5,6,7,8,13,15,16,17,21,22,25,29,30,33,34,38,39,40,42 10.4 Areas in Polar Coordinates. 8,9,10,11,14,17,18,21,23,24,27,28,29,30,31,37,38,41	lecture In-class	A3,A7,C2, B4,D1	-
16.	Final Exam				

*** Teaching Methods:**

- Inter active lectures
- Group discussions
- Self reading
- Homework

*** Evaluation:**

Mid exam	30%
Quizzes	20%
Final Exam	50% (Week 16)
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Total	100%

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* **Textbook :**

- James Stewart, **Calculus** (Early Transcendentals), 7th Edition, Thomson, Metric international version, Canada, 2012

* **References :**

- Anton, Bivens, Davis, **Calculus**, (Early Transcendentals), 10th Edition, Wiley, 2012



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Subject Coordinator	- Dr. Mona Khandakji -	Signature:
Head of Curriculum Committee	--- Dr.Husam Miqdad -	Signature:
Department Head	-- Dr.Husam Miqdad	Signature:
Faculty Dean	-- Dr. Hadeel Al Saed	Signature:

Copy to:

- Department Head.
- Head of Curriculum Committee.
- Course File.

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