Jadara University  **جامعة جدارا**

COURSE DESCRIPTIONS

Faculty	Science and Information Technology				
Department	Mathematics			**NQF level**	
Course Title	Calculus II	**Code**	505102	**Prerequisite**	853101
Credit Hours	3	**Theory**	3	**Practical**	
Course Leader	Dr. Areen Al-khateeb	**email**	Areen.k@jadara.edu.jo		
Lecturers	Dr. Areen Al-khateeb Dr.Ahmed Heilat	**emails**	Areen.k@jadara.edu.jo a.heilat@jadara.edu.jo		
Lecture time	10:00-11:30 Mon-Sat	**Classroom**	D009 - Online		
Semester	1	**Production**		**Updated**	2021
Awards				**Attendance**	Fulltime

Short Description
Techniques of integration: integration by substitution; integration by parts, integrating powers of trigonometric functions, trigonometric substitutions, integrating rational functions, partial fractions, rationalization, miscellaneous substitution; improper integrals; application of definite integral: volumes, length of a plane curve, area of a surface of revolution polar coordinates and parametric equations: polar coordinates, graphs in polar coordinates, area in polar coordinates; infinite series: sequences, infinite series, convergence tests, absolute convergence, conditional convergence; alternating series; power series: Taylor and Maclurine series, differentiation and integration of power series
Course Objectives
Upon completion of this course, the student should be able to: Master techniques of integration. Solve some practical applications of calculus such as finding areas, volumes and length of curves. Applications should be solved using integration in a clear, logical manner. Develop student ability to reason in a clear, logical manner and transfer mathematical concepts from one situation to another rather than simply memorize mechanical procedures.

Learning Outcomes
A. Knowledge - Theoretical Understanding
a1) Distinguish an improper integral and the sequences and explain whether it is convergent or divergent a2) Show the knowledge of convergence tests, their usefulness, conditions, and limitations, and apply the tests to determine the convergence or divergence of a series.
B. Knowledge - Practical Application
a3) Compute integrals using various techniques including the methods of substitution, integration by parts, trigonometric substitution, partial fractions.
C. Skills - Generic Problem Solving and Analytical Skills

b1) Determine whether given series converges or not, and determine the power series expansions of functions.
D. Skills - Communication, ICT, and Numeracy
b2) Evaluate the volume of solids of revolution, the area of surface of revolution , the arc length of graphs of a function , polar coordinates , polar graphs and the area and arc length using polar coordinates.
E. Competence: Autonomy, Responsibility, and Context
Teaching and Learning Methods
• Face to Face learning • E-learning. • Distance learning using (Microsoft Teams). • Problem based learning (PBL), • Direct students to self-learning through textbooks, library, e-library, and research papers. • Tutorials, and discussion.
Assessment Methods
Lectures, Assignments, Exams, Quizzes, Discussion and Interaction

Week	Day	Hours	CLOs	Topics	Teaching & Learning Methods	Assessment Methods
1	Mon	1.5	a1,a3,	7.1 Integration by parts.	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a1,a3,	7.2 Trigonometric Integrals Functions by Partial Fraction	Distance learning	
2	Mon	1.5	a1,a3,	7.3 Trigonometric Substitutions	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a1,a3,	7.4 Integration of Rational	Distance learning	
3	Mon	1.5	a1,a3,	7.5 Strategy for integration	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a1,a3,	7.8 Improper Integrals	Distance learning	
4	Mon	1.5	a3,b2	6. 1 Areas between two curves.	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a3,b2	6. 1 Areas between two curves.	Distance learning	
5	Mon	1.5	a3,b2	6.2 Volumes	Face to Face learning	

	Sat	1.5	a3,b2	6.2 Volumes	Distance learning	Assignments, Exams, Quizzes, Discussion and Interaction
6	Mon	1.5	a3,b2	6.3 Volumes by Cylindrical shells	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a3,b2	6.3 Volumes by Cylindrical shells	Distance learning	
7	Mon	1.5	a3,b2	8.1 Arc. length	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a3,b2	8.1 Arc. length	Distance learning	
8	Mon	1.5	a3,b2	8.2 Area of a surface of revolution	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a3,b2	8.2 Area of a surface of revolution	Distance learning	
9	Mon	1.5	a1,a2, b1	11.1 Sequences	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a1,a2, b1	11.1 Sequences	Distance learning	
10	Mon	1.5	a1,a2, b1	11.2 Series 11.3 Integral Test.	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a1,a2, b1	11.4 Comparison test and limit comparison test	Distance learning	
11	Mon	1.5	a1,a2, b1	11.5 Alternating Series 11.6 Ratio and Root tests and Absolute convergence	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a1,a2, b1	11.7 Strategy for testing Series.	Distance learning	
12	Mon	1.5	a1,a2, b1	11.8 Power Series.	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	a1,a2, b1	11.9 Representation of functions as power series. (Differentiation and Integration of power series).	Distance learning	
13	Mon	1.5	a1,a2, b1	11.10 Taylor and Maclaurin series	Face to Face learning	

	Sat	1.5	a1,a2, b1	11.10 Taylor and Maclaurin series	Distance learning	Assignments, Exams, Quizzes, Discussion and Interaction
14	Mon	1.5	b2	10.3 Polar Coordinates	Face to Face learning	Assignments, Exams, Quizzes, Discussion and Interaction
	Sat	1.5	b2	10.3 Polar Coordinates	Distance learning	
15	Mon	1.5	b2	10.4 Areas in Polar Coordinates	Face to Face learning	Exams
	Sat	1.5	b2	10.4 Areas in Polar Coordinates	Distance learning	
Final Exam						Exam

Infrastructure	
Textbook	James Stewart (2015) Calculus (Early Transcendental), 8th Edition, Thomson, Metric international version, Canada
References	(1) G. Thomas (2005) Calculus, 11th edition, Addison Wesley (Person Education). (2) R. Smith and R. Minton (2007) Calculus, 3rd edition, McGraw Hill. (3) Howard Anton, Irl Bivens and Stephen Davis (2005) Calculus, 8th edition, John Wiley and sons Inc., New York.
Required reading	
Electronic materials	
Other	

Course Assessment Plan							
Assessment Method		**Grade**		**CLOs**			
			a1	**a2**	**a3**	**b1**	**b2**
First (Midterm)		30	8		16		6
Second (if applicable)							
Final Exam		50	8	16	14	6	6
Coursework							
Coursework assessment	Assignments	10			5		5
	Case study						
	Discussion and interaction						
	Group work activities						
	Lab tests and assignments						

	Presentations						
	Quizzes	10	5		5		
Total		100					

Plagiarism
Plagiarism is claiming that someone else's work is your own. The department has a strict policy regarding plagiarism and, if plagiarism is indeed discovered, this policy will be applied. Note that punishments apply also to anyone assisting another to commit plagiarism (for example by knowingly allowing someone to copy your code). Plagiarism is different from group work in which a number of individuals share ideas on how to carry out the coursework. You are strongly encouraged to work in small groups, and you will certainly not be penalized for doing so. This means that you may work together on the program. What is important is that you have a full understanding of all aspects of the completed program. In order to allow proper assessment that this is indeed the case, you must adhere strictly to the course work requirements as outlined above and detailed in the coursework problem description. These requirements are in place to encourage individual understanding, facilitate individual assessment, and deter plagiarism.

د.عرين الخطيب