



**Jordan University of Science and Technology**  
**Faculty of Science & Arts**  
**Mathematics Department**

MATH201 Intermediate Analysis

Second Semester 2022-2023

**Course Catalog**

3 Credit Hours. Three-Dimensional Space: vectors, lines, planes. Vector-Valued Functions: calculus of vector-valued functions, arc length parameterization, unit tangent vector, unit normal vector, binormal vector, and curvature. Partial Derivatives: limits and continuity, partial derivatives, chain rule, gradient and directional derivatives, Lagrange multipliers. Multiple and Triple Integrals: double integral over (non)rectangular regions, double integral in polar coordinates, applications (area, surface area, and volume), triple integral over (non)rectangular solids, triple integral in cylindrical and spherical coordinates, application (volume). Vector Calculus: line integrals, independence of path; conservative vector fields, and Green's Theorem.

**Text Book**

<b>Title</b>	Calculus: Late Transcendentals
<b>Author(s)</b>	H. Anton, I. C. Bivens, and S. Davis
<b>Edition</b>	9th Edition
<b>Short Name</b>	TextBook
<b>Other Information</b>	

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref 1	Calculus	R. Smith and R. Minton	3rd Edition	
Ref 2	Calculus and Analytic Geometry	G.Thomas and R. Finney	9th Edition	
Ref 3	Calculus: One and Several Variables	S. Salas and E. Hille	7th Edition	

**Instructor**

Name	<b>Miss Shatha Alghueiri</b>
Office Location	-

Office Hours	Sun : 11:30 - 12:30 Mon : 10:00 - 11:30 Tue : 11:30 - 12:30 Wed : 10:00 - 11:30 Thu : 11:30 - 12:30
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Instructor	
Name	<b>Dr. Mohammad Al Dolat</b>
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Instructor	
Name	<b>Dr. Isam Al Darabsah</b>
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Instructor	
Name	<b>Prof. Samer Al Ghour</b>
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<b>Class Schedule &amp; Room</b>
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Section 1:  
Lecture Time: Sun, Tue, Thu : 08:30 - 09:30  
Room: NG54

Section 2:  
Lecture Time: Sun, Tue, Thu : 10:30 - 11:30  
Room: NG54

Section 3:  
Lecture Time: Sun, Tue, Thu : 12:30 - 13:30  
Room: NG43

Section 4:  
Lecture Time: Sun, Tue, Thu : 13:30 - 14:30  
Room: NG55

Section 6:  
Lecture Time: Mon, Wed : 08:30 - 10:00  
Room: NG55

Section 7:  
Lecture Time: Mon, Wed : 10:00 - 11:30  
Room: SF05

### Prerequisites

Line Number	Course Name	Prerequisite Type
901020	MATH102 Calculus 2	Prerequisite / Pass

### Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Ch.11 Vectors: Parametric Equations of Lines	<b>Section 11.5</b> From <b>TextBook</b>
Week 2	Planes in 3-Space, Quadric Surfaces	<b>Sections 11.6,11.7</b> From <b>TextBook</b>
Week 3	Ch.12 Vector-Valued Functions : Introduction to Vector-Valued Functions, Vector-Valued Functions, Arc Length Parameter	<b>Sections 12.1, 12.2, 12.3</b> From <b>TextBook</b>
Week 4	Unit Tangent, Normal, and Binormal Vectors, Curvature	<b>Sections 12.4, 12.5</b> From <b>TextBook</b>
Week 5	Ch. 13 Partial Derivatives: Functions of Two or More Variables, Limits and Continuity, Partial Derivatives, Differentiability and Local Linearity	<b>Sections 13.1, 13.2, 13.3, 13.4</b> From <b>TextBook</b>
Week 6	The Chain Rule, Directional Derivatives and Gradients, Tangent Planes and Normal Vectors	<b>Sections 13.5, 13.6, 13.7</b> From <b>TextBook</b>

Weeks 7, 8	Maxima and Minima in 2-Variables, Lagrange Multipliers	<b>Sections 13.8, 13.9 From TextBook</b>
Week 9	Ch. 14 Multiple Integrals: Double Integrals, Double Integrals over Non-rectangular	<b>Sections 14.1, 14.2 From TextBook</b>
Week 10	Double Integrals in Polar Coordinates	<b>Section 14.3 From TextBook</b>
Week 11	Surface Area, Triple Integrals	<b>Sections 14.4, 14.5 From TextBook</b>
Weeks 12, 13	Triple Integrals in Cylindrical and Spherical Coordinates	<b>Section 14.6 From TextBook</b>
Week 14	Ch. 15 Topics in Vector Calculus: Vector Fields, Line Integrals, Independence of Path; Conservative Vector Field	<b>Sections 15.1, 15.2, 15.3 From TextBook</b>
Week 15	Green's Theorem	<b>Section 15.4 From TextBook</b>
Week 16	Final Exams	

<b>Mapping of Course Outcomes to Program Student Outcomes</b>	<b>Course Outcome Weight (Out of 100%)</b>	<b>Assessment method</b>
Be able to recognize the rectangular coordinate systems in three dimensions, and the analytic geometry of lines, planes, and other basic surfaces. Also, be able to understand the calculus of vector-valued functions and apply these concepts to describe the curvature of a given curve. [1SLO1]	30%	
Be able to know the real valued functions of several variables, their graphs: level curves, and level surfaces, and their analytical geometry. Also, to solve optimization problems involving two and three variables. [1SLO1]	35%	
Be able to evaluate double and triple integrals, volumes of bounded solids, and areas of bounded regions. [1SLO1]	25%	
Be able to evaluate line integrals and analyze properties of vector fields and flow. [1SLO1]	10%	

<b>Relationship to Program Student Outcomes (Out of 100%)</b>					
SLO1	SLO2	SLO3	SLO4	SLO5	SLO6
100					

<b>Evaluation</b>	
<b>Assessment Tool</b>	<b>Weight</b>
First Exam	30%

Second Exam	30%
Final Exam	40%

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