



# Course Specification

— (Bachelor)

**Course Title:** Calculus II

**Course Code:** MH132

**Program:** Information Technology/Computer Science

**Department:** Basic Sciences and Humanities

**College:** College of Computer and Information Sciences

**Institution:** Majmaah University

**Version:** 2023

**Last Revision Date:** 11/09/2023



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## A. General information about the course:

### 1. Course Identification

1. Credit hours: (3,1,0)

#### 2. Course type

A.  University  College  Department  Track  Others

B.  Required  Elective

3. Level/year at which this course is offered: ( Level 4)

4. Course general Description: Mathematics

5. Pre-requirements for this course (if any): MH113-Calculus I

6. Pre-requirements for this course (if any):

7. Course Main Objective(s):

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul>		
4	Distance learning		





### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	15
5.	Others (specify)	
<b>Total</b>		<b>60</b>

### B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	CLO (1) Manipulate the integration of complicated functions and evaluate double and triple integrals	<b>K1</b>	Classroom Teaching	Quiz, Exam, Mid-Final Exam
1.2				
...				
<b>2.0</b>	<b>Skills</b>			
2.1	CLO (2) Use various tests to determine series convergence and successfully solve problems involving infinite series.	<b>S5</b>	Classroom Teaching	Quiz, Exam, Mid-Final Exam
2.2	CLO (3) Use polar coordinates and their applications in the parametric equations.	<b>S1</b>	Classroom Teaching	Quiz, Exam, Mid-Final Exam
2.3	CLO (4) Differentiate functions of two and three variables.	<b>S1</b>	Classroom Teaching	Quiz, Exam, Mid-Final Exam
2.4				
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1				
3.2				
...				



## C. Course Content

No	List of Topics	Contact Hours
1.	Review of Integration by Substitution and Integration by Parts, Integration of Rational Functions Using Partial Fractions,	4
2.	Trigonometric Techniques of Integration, Integrals involving logarithmic, exponential, and hyperbolic functions,	4
3.	Improper Integrals.	4
4.	Sequences and limit of a sequence. Infinite series of constant terms, convergence tests	4
5.	convergence tests, alternating series and absolute convergence.	4
6.	Power series, the ratio test, and radius of convergence;	4
7.	Taylor and MacLaurin series.	4
8.	Vectors in Space, Dot Product, Cross Product,	4
9.	Lines and Planes in Space Cylindrical and Spherical Coordinates.	4
10.	Plane Curves and Parametric Equations, Calculus and Parametric Equations	4
11.	Polar ordinates, Calculus and Polar Coordinates.	4
12.	Functions of several variables, Partial derivatives,	4
13.	Total derivative, Chain rule.	4
14.	Double and Triple Integrals in Cartesian Coordinates; Areas and Volumes, Double Integrals in Polar Coordinates;	4
15.	Triple Integrals in Cylindrical and Spherical Coordinates.	4
<b>Total</b>		<b>60</b>

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,7,10, 12	15%
2.	Assignments	3,6,9,13	20%
3.	Mid Term Exam	8	20%
4.	Class Participation	All weeks	5%
5.	Final Exam	16	40%

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

#### Essential References

Robert Smith, Roland Minton “Calculus, Early Transcendental Functions” McGraw-Hill, 4 edition (2012). ISBN 978-0-07-338311



<b>Supportive References</b>	
<b>Electronic Materials</b>	
<b>Other Learning Materials</b>	

## 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
<b>Technology equipment</b> (projector, smart board, software)	Smart Board, Projector
<b>Other equipment</b> (depending on the nature of the specialty)	Internet Connection

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer faculty members	direct
Effectiveness of Students assessment	Students	indirect
Quality of learning resources	Faculty	direct
The extent to which CLOs have been achieved	Peer Reviewer	direct
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	
<b>REFERENCE NO.</b>	
<b>DATE</b>	

