



# Course Specification

— (Bachelor)

**Course Title:** Integral Calculus

**Course Code:** MTHS 131

**Program:** Applied Statistics & Data Management

**Department:** Mathematics

**College:** College of Science

**Institution:** Majmaah University, Saudi Arabia

**Version:** 2023

**Last Revision Date:** 18/09/2023



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## A. General information about the course:

### 1. Course Identification

#### 1. Credit hours: ( ..... )

3(2+2)

#### 2. Course type

A. University College Department Track Others

B. Required Elective

#### 3. Level/year at which this course is offered: ( 2 )

#### 4. Course general Description:

This course covers the generalization of the concepts of calculus such as recognize Definite Integral and its properties- Mean value theorem of integral, The fundamental theorem of Calculus- Indefinite integrals- Standard integrals- Derivatives and Integrals of hyperbolic and inverse hyperbolic functions, Techniques of Integrations: Substitution method- Integration by Parts- Trigonometric Substitutions- Integrals involving Quadratics- Integration by Partial Fractions and applications of Integration

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

Differential Calculus (MTHS121)

#### 6. Co-requisites for this course (if any):

N/A

#### 7. Course Main Objective(s):

##### Generally,

1. To enable the students to understand the concepts of Integration.
2. The course aims at providing the student with the proper knowledge, cognitive skills, interpersonal skills, responsibility, communication skills and use of information technology skills.

##### Specially, Study of main concepts of Integration as follows

- 1- Studying Definite integral and its properties.
- 2- Studying the mean value theorem of integral.
- 3- Studying the fundamental theorem of Calculus.
- 4- Having the knowledge of Indefinite integral and Standard integrals.
- 5- Having the knowledge of integrals of hyperbolic and inverse hyperbolic functions.



- 6- Having the knowledge of Integration technique.  
7- Applied integrations to evaluate areas and volumes.

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

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	42	70%
2	E-learning	18	30%
3	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>	0	0
4	Distance learning	0	0

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

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	0
3.	Field	0
4.	Tutorial	30
5.	Others (specify)	0
<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
1.0	Knowledge and understanding			
1.1	<b>Reproduce</b> fundamentals and concepts of Statistics and Data science	K1	<b>Direct teaching:</b> Inquiry-based instruction PowerPoints and discussions  <b>Aimed teaching:</b> Discovery and oral questions	Quizzes Midterms Final examination E-exam Oral Exam





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	The <b>ability</b> to describe and evaluate the principles, concepts and techniques associated with Statistics and Data science	K1	<b>Direct teaching:</b> Inquiry-based instruction PowerPoints and discussions  <b>Aimed teaching:</b> Discovery and oral questions	Quizzes Midterms Final examination E-exam Oral Exam
...				
<b>2.0</b>	<b>Skills</b>			
2.1	<b>Demonstrate</b> proficiency with statistical analysis of data	S1	<b>Direct teaching:</b> Inquiry-based instruction PowerPoints and discussions  <b>Aimed teaching:</b> Discovery and oral questions	Quizzes Midterms Final examination E-exam Oral Exam
2.2	Analytical skills involving paying attention to detail and ability to construct logical arguments using correct technical language related to Statistics and Data science	S1	<b>Direct teaching:</b> Inquiry-based instruction PowerPoints and discussions  <b>Aimed teaching:</b> Discovery and oral questions	Quizzes Midterms Final examination E-exam Oral Exam
...				
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	<b>Categorize</b> work in a group, communicating effectively	V2	<b>Direct teaching:</b> Inquiry-based instruction PowerPoints and discussions  <b>Aimed teaching:</b> Discovery and oral questions	Quizzes Midterms Final examination E-exam Oral Exam
3.2				
...				





## C. Course Content

No	List of Topics	Contact Hours
1.	Areas and Riemann sum.	6
2.	Definite Integral and its properties -Mean value theorem of integral.	6
3.	The fundamental theorem of Calculus.	6
4.	Indefinite integrals -Standard integrals.	6
5.	Integration by Part Trigonometric Substitutions Integrals involving.	6
6.	Quadratics Integration by Partial Fractions.	15
7.	integral application. :Areas between curves ,Volumes ,Arc length	15
<b>Total</b>		<b>60</b>

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm1	6	15
2.	Midterm2	12	15
3.	Homework	Through of semester	5
4.	Project -Presentation	15	10
5.	Quizzes	Through of semester	10
6.	E-Tests	14	5
7.	Final Examination	16	40
	TOTAL		100
...			

\*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	Calculus/ Smith/Minton Mc Grew Hill 20129780071316576
	Calculus and analytical Geometry (9 <sup>th</sup> Edition) / George B. Thomas, Ross L. Finney/ Addison-Wesley publishing company/1996





<b>Supportive References</b>	Thomas' Calculus
<b>Electronic Materials</b>	<a href="http://joshua.smcvt.edu/alculus">http://joshua.smcvt.edu/alculus</a> <a href="http://faculty.mu.edu.sa/khaled/calculus_1">http://faculty.mu.edu.sa/khaled/calculus_1</a> <a href="http://www.youtube.com/calculus/">http://www.youtube.com/calculus/</a>
<b>Other Learning Materials</b>	Calculus/ Smith/Minton Mc Grew Hill 20129780071316576  Calculus and analytical Geometry (9 <sup>th</sup> Edition) / George B. Thomas, Ross L. Finney/ Addison-Wesley publishing company/1996

## 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room with speakers and internet access. Classroom with capacity of 30-students. Library
<b>Technology equipment</b> (projector, smart board, software)	Blackboard
<b>Other equipment</b> (depending on the nature of the specialty)	Laboratory.

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Faculty	Direct
Effectiveness of Students assessment	Program	Direct
Quality of learning resources	Leaders	Direct
The extent to which CLOs have been achieved	, Program	Indirect
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>	



