



**Course Descriptor**  
**MATH 406 Calculus III**

<b>Proposed Academic Year</b>	2021 / 2022	<b>Last Reviewed Academic Year</b>	
<b>Course Code</b>	MATH 406	<b>Course Title</b>	Calculus III
<b>Credit hours</b>	3	<b>Level of study</b>	Undergraduate
<b>College / Centre</b>	College of Applied and Health Sciences	<b>Department</b>	Basic Sciences
<b>Co-requisites</b>	--	<b>Pre-requisites</b>	Calculus I Calculus II

**1. COURSE OUTLINE**

[This is a three-hour Calculus III course primarily designed for engineering majors. The student is assumed to be capable and versed in the standard Calculus I and Calculus II topics. Students of Calculus III will develop the quantitative skills needed to be successful in subsequent courses in engineering. These skills will enhance their ability to analyze, solve and communicate their solutions to fellow professionals using the language of mathematics.]

**2. AIMS**

[The aim of this course is to lay a firm foundation for students in Calculus III. The course will introduce students to the concepts of Parametric Equations, Calculus with Parametric Curves, Polar Coordinates, 3-D coordinate systems, Vectors, Dot Product, Cross Product, Equation of lines and Planes, Function of several variables, Function of several variables and Limits and Continuity. It will develop mathematical critical thinking and problem-solving skills.]

**3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS**

<b>Learning Outcomes (Definitive)</b>	<b>Teaching and Learning methods (Indicative)</b>	<b>Assessment (Indicative)</b>
Upon successful completion of this course, students will be able to:		
1. Graph the parametric equations and finding its calculus.	Online Lecture/ electronic board/ discussion/ presentations/ solve examples and exercises.	<i>Quizzes, Mid-term, Final exam, Assignment, Participation, HomeWorks</i>
2. Graph and solve the polar equations problems.	Online Lecture / electronic board/ discussion/ presentations/ solve examples and exercises.	<i>Quizzes, Mid-term, Final exam, Assignment, Participation, HomeWorks</i>
3. Understand and find the mathematical operations in the 3-D dimension.	Online Lecture / electronic board/ discussion/ presentations/ solve examples and exercises.	<i>Quizzes, Mid-term, Final exam, Participation, HomeWorks</i>
4. Function of several variables with its calculus problems and double integrations.	Online Lecture/ / electronic board/ discussion/ presentations/ solve examples and exercises.	<i>Quiz, Participation, Final exam</i>



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**4. ASSESSMENT WEIGHTING**

Assessment	Percentage of final mark (%)
Quizzes	20%
Midterm Exam	20%
Assignment / HomeWorks	10%
Participation / Questions	10%
Final Exam	40%
<b>TOTAL</b>	<b>100%</b>

**5. ACHIEVING A PASS**

Students will achieve **3** credit hours for this course by passing **ALL** of the course assessments and achieving a **minimum overall score of 50%**

**NB \*Ensure that ALL learning outcomes are taken into account**

**6. COURSE CONTENT (Indicative)**

Parametric Equations (10.1)	
Calculus with Parametric Curves (10.2)	
Polar Coordinates (10.3)	
Area and length in Polar coordinates (10.4)	
3-D coordinate systems (12.1)	
Vectors (12.2)	
Dot Product (12.3)	
Cross Product (12.4)	
Equation of lines and Planes (12.5)	
Function of several variables (14.1)	
Limits and Continuity (14.2)	
Partial Derivatives (14.3)	
Directional Derivatives and The Gradient Vector (14.6)	
Maximum and Minimum Values (14.7)	
Double Integral (15.1)	
Double Integral over a region (15.3)	
<b>TOTAL HOURS</b>	<b>40</b>
Plus <b>RECOMMENDED INDEPENDENT STUDY HOURS</b>	<b>15</b>
<b>TOTAL COURSE HOURS</b>	<b>55</b>



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**7. RECOMMENDED REFERENCES**

**Core text/s:**

Calculus, Early Transcendental, by James Stewart, 7<sup>th</sup> edition.

*Calculus III*, (1985), Marsden, Jerrold E. and Weinstein, Alan J. Springer-Verlag, New York. ISBN 9780387909851.