



Course Description/ Faculty of Science

Department of Mathematics

Calculus (2)
First semester 2022/2023

1. Instructor(s)/ Coordinator

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Office Hours:	Sunday – Tuesday	9:30 – 10:30
	Monday - Wednesday	9:00 – 10:00
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Teaching Assistant (if any):	None	

2. Course Information

Level: First Year	Course Title: Calculus (2)	Course No.: 401102
Class Time: Sunday and Tuesday 10:30 – 11:30	Prerequisite / Co-requisite: Calculus (1) (401101)	Course Type: Theoretical
Study Hours: 3	Semester: First	Academic Year 2022/2023
Type of teaching: <input type="checkbox"/> Face to face <input checked="" type="checkbox"/> Blended (<input checked="" type="checkbox"/> 2:1 <input checked="" type="checkbox"/> 1:1 <input type="checkbox"/> 1:2) <input type="checkbox"/> Online		

3. Textbook(s)

Title	Calculus, EARLY TRANSCENDENTALS
Author	HOWARD ANTON, IRL BIVENS and STEPHEN DAVIS
Publisher	JOHN WILEY & SONS, INC.
Year	2012
Edition	10th edition
Textbook Website	https://books.google.jo/books/about/Calculus_Early_Transcendentals_10th_Edit.html?id=md0bAAAAQBAJ&redir_esc=y

4. References (books and research published in periodicals or websites)

1)	James Stewart, Calculus: Early Transcendentals, 7th Edition, Brooks/ Cole 2012. Call number in PU library: 515.15 STE
2)	Calculus, EARLY TRANSCENDENTALS, 12th by Thomas

5. Course Description

- Use techniques of integration: by parts, trigonometric integrals, trigonometric substitutions, partial fractions. Study the improper integrals. Use the techniques of integration to study problems of finding volumes of solids obtained when revolving a curve of a function around the x-axis or the y-axis
- Study the sequences. L'Hopital's rule. Improper integrals. Infinite series, convergence and divergence, convergence tests, Maclaurin and Taylor series
- Learn the parametric equations. Study the polar coordinates

6. Course Outcomes (CO's)

Upon successful completion of the course, student will be able to: (Use Bloom's Taxonomy Verbs)

CO#		SO
1.	Calculate different types of integration.	1,4
2.	Learn the concepts of techniques of integration.	1
3.	Learn to calculate the integration under any given function.	1,4
4.	Learn to use the integration to calculate the volume for any function.	1
5.	Apply the concept of series to estimate it's converge or diverge.	1,4
6.	Learn about the concept of alternative series.	1,4
7.	Find the interval of convergence of power series.	1,4
8.	Learn to transform to polar equation from Cartesian coordinate and evaluate the Area for Polar Curves.	1,4

7. Course Contents

Week	Chapter	Subject	Pages and Assignments
1 – 6	<u>Chapter 7</u> Principles of integral evaluation	7.1 An overview of integration methods 7.2 Integration by parts 7.3 Integrating Trigonometric functions 7.4 Trigonometric substitutions 7.5 Integrating rational functions by partial fractions 7.8 Improper integrals	488 – 533 & 547 - 560 all odd questions
7	<u>Chapter 6</u> Applications of the definite integral in geometry, science and engineering	6.2 Volumes by disks and washers 6.3 Volumes by cylindrical shells	67 – 121 all odd questions

8 – 13	Chapter 9 Infinite series	9.1 Sequences 9.2 Monotone sequences 9.3 Infinite series 9.4 Convergence tests 9.5 The comparison, Ratio and Root tests 9.6 Alternating series. Absolute and conditional convergence 9.7 Maclaurin and Taylor polynomials 9.8 Maclaurin and Taylor series; Power series 9.9 Convergence of Taylor series 9.10 Differentiating and integrating power series; Modeling with Taylor series	596 – 691 all odd questions
14	Chapter 10 Parametric and Polar curves; Conic sections	10.2 Polar coordinates 10.3 Area for Polar Curves	705 – 719 722-730 all odd questions

8. Teaching and learning Strategies and Evaluation Methods

Evaluation/Measurement Method(Exam/presentations/discussion/ assignments)	Learning Activities	Teaching Strategies	Student Learning Outcomes
Exams Discussion Assignments	Give Home works and assignments	- Writing on the blackboard - Ask questions and Solve various issues	SO1+SO4

9. Assessment

Distribution of grades	Assessment Time	Methods Used
30	TBA	Assignments, Homework and Quizzes
30	Between 20/11/2022 and 8/12/2022	Midterm Exam
40	Final Exams Period	Final Exam

10. Program Educational Objectives (PEOs) (To be added by the academic department)

A few years after graduation, Mathematics graduates will be able to:

PEO's	Program Educational Objectives
PEO1	Demonstrate a solid scientific and technical competence using what they learned in Mathematics and related fields to excel in their careers. إظهار كفاءة علمية وتقنية قوية باستخدام ما تعلموه في الرياضيات والمجالات ذات الصلة للتميز في حياتهم المهنية.
PEO2	Exhibit the ability to engage in life-long learning, training, and self-development, assimilating the changes and advances in the profession and pursuing graduate studies. إظهار القدرة على الانخراط في التعلم مدى الحياة، والتدريب، وتطوير الذات، واستيعاب التغييرات والتطورات في المهنة ومتابعة الدراسات العليا.
PEO3	Exhibit professional integrity, productive teamwork, effective communication skills, and the capability for ethical decision making. إظهار النزاهة المهنية والعمل الجماعي المنتج ومهارات الاتصال الفعال والقدرة على اتخاذ القرارات الأخلاقية

11. Student Learning Outcomes for the Program. (SO's)

SO's (1-6)	Science Student Learning Outcomes for the Program
1	An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
2	An ability to formulate or design a system, process, procedure or program to meet desired needs.
3	An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
4	An ability to communicate effectively with a range of audiences.
5	An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.
6	An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

12. Mapping between Student Outcomes and Program Educational Objectives

PEOs	SO1	SO2	SO3	SO4	SO5	SO6
PEO1	■	■	■			
PEO2		■	■		■	
PEO3				■	■	■