Department of Mathematics

College of Science

Salahaddin University-Erbil

Subject: Calculus I

Course Book: First year – First Course

Lecturer's name: Imad A. Aziz

Academic Year: 2023-2024

Course Book

1. Course name	Calculus I
2. Lecturer in charge	Imad A. Aziz
3. Department/ College	Mathematics / Science
4. Contact	e-mail: imad.aziz@su.edu.krd Tel: +9647504639909
5. Time (in hours) per week	Theory: 4 Tutorial: 2
6. Office hours	
7. Course code	
8. Teacher's academic profile	**23/6/2020** lecturer at Department of Mathematics, College of Science, University of Salahaddin-Erbil, Iraq. **16/6/2020** Awarded Ph.D. in Mathematics, Department of Mathematics, College of Science, University of Salahaddin-Erbil, Iraq. **3/9/2006** Assistant lecturer at Department of Mathematics, College of Science, University of Salahaddin-Erbil, Iraq. **31/7/2006** Awarded M.Sc. in Mathematics, Department of Mathematics, College of Science, University of Al-Mustansiriyah, Iraq. **10/1/2002** Awarded B.Sc. in Mathematics, Department of Mathematics, College of Science, University of Salahaddin-Erbil, Iraq. **1995-1996** Awarded Baccalaureate, Hamren Secondary
9. Keywords	Function, Limit, Continuity, Derivative, Differential

10. Course overview:

This introductory calculus course covers differentiation and integration of functions of one variable, with applications. Topics include: Concepts of Function, Limits and Continuity. Differentiation Rules, Application to Graphing, Rates, Approximations, and Extremum Problems.

11. Course objective:

By the end of this course, students will be able to:

- Demonstrate knowledge of basic precalculus concepts and skills.
- Evaluate limits.
- Recognize continuity and use the properties of continuous functions.
- Find derivatives of algebraic and trigonometric functions using the definition or basic rules of differentiation.
- Find rates of change.
- Solve related rate problems.

- Analyse and sketch the graphs of curves.
- Find extreme values in optimization problems.

12. Student's obligation

a. Students reign an commitment to come on time and remain in the classroom for the duration of scheduled classes and Labs.
b. Nothingness speak students with each other during lecture.
c. All devices must be turned off.
d. When teacher ask question, Students will be to raise your hand before answer his question.
e. Students own an obligation to write tests and final examinations at the times scheduled by the teacher or the College.

13. Forms of teaching

I give hard copy of My lecture notes to students before coming lecturer time. first I remember students about previous lecture, and then I start new lecture. At the end of the lecture give a homework for the next lecture. During this proses I am use presentation and whiteboard.

14. Assessment scheme

1. ***Practical:*** 20% (Homework, Assignments and Quizzes).
2. ***Theoretical:*** 20% (Midterm exams).
3. ***Final Exam: Practical:*** 0% and ***Theoretical:*** 60% .

15. Student learning outcome:

- Calculate limits, derivatives, and indefinite integrals of various algebraic and trigonometric functions of a single variable.
- Apply the definition of continuity to pure and applied mathematics problems.
- Utilize the definition of the derivative to differentiate various algebraic and trigonometric functions of a single variable.
- Use the properties of limits and the derivative to analyse graphs of various functions of a single variable including transcendental functions.
- Employ the principles of the differential calculus to solve optimization problems, related rates exercises, and other applications.

16. Course Reading List and References:

- Grossman, S.I., 1984. Calculus. Academic Press.
- Thomas, G.B., Hass, J., and Weir, M.D., 2017. Thomas' Calculus Fourteenth Edition.
- Stewart, J., 2016. Calculus. Cengage Learning.
- Ayres, F. and Mendelson, E., 2009. Schaum's outline of calculus. New York: McGraw-Hill.

17. The Topics:	Lecturer's name

1. Introduction to Functions on real: • Interval, absolute value, Inequality • Functions (properties, Special functions (Trigonometric**,** logarithm, exponential) • Function in polar coordinate • Graph of functions • Domain and range **2. Limits and Continuity of function** • Introduction to limit • Limit by definition • One side limit • Limit at infinity • Continuity **3. Derivatives:** • Definition and basic properties of derivatives • Differentiation rules for power, product, quotient, and chain rules Salahaddin University-Erbil-College of Science Mathematics Department Syllabus for BSc in Mathematics • Higher-order derivatives • Derivatives of Trigonometric, logarithm, exponential • Implicit differentiation **4. Applications of Derivatives:** • Maxima and minima • Optimization problems • Curve sketching • L'Hôpital's rule • Applications in physics, economics, and engineering	This Column are not applicable because timetables of holidays will change that is I cannot Determine a week by week review of the topics.
18. Practical Topics (If there is any)	
	This Column are not applicable because timetables of holidays will change that is I cannot Determine a week by week review of the topics.
19. Examinations: Questions in the examination will be arranged the matching mode by way of the examples and exercises that I give delivered in the lecture notes. Sometimes will be have extra mark in examination for worthy students.	
20. Extra notes: Answers of examination will be find in the board’s declaration Mathematics department after every examination.	

21. Peer review