Department of Mathematics

College of Science

Salahaddin University-Erbil

Subject: Calculus II

Course Book: First year – Second 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:

- Integrate using techniques of integration.
- Identify improper integrals and test for their convergence.
- Evaluate integrals.
- Sketch the graph of a function using asymptotes, monotonicity, and concavity.
- Calculate areas and volumes of revolution.
- Formulate and solve time-related and 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:

- Apply summation rules
- Interpret definite integrals
- Explain the Fundamental Theorem of Calculus
- Use the net change theorem
- Apply substitution to indefinite and definite integrals
- Integrate functions involving exponential and logarithmic functions
- Integrate functions resulting in inverse trigonometric functions
- Approximate integrals when the antiderivative is impossible to calculate
- Calculate the areas of curved regions by using integration methods
- Find the volume of a solid
- Apply the integration-by-parts formula to solve indefinite and definite integrals
- Solve integration problems involving trigonometric functions
- Solve integration problems involving trigonometric substitution
- Identify linear and quadratic factors in rational functions
- Solve integration problems using alternative strategies of revolution using various methods

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. Integration: • Introduction to definite and indefinite integrals • Basic integration formulas and techniques **2. Techniques of Integration:** • Integration by parts • Integration of rational functions by partial fractions • Integration by substitution • Integration using trigonometric identities • Integration by trigonometric substitution **3. Fundamental Theorem of Calculus:** • First and Second Fundamental Theorems of Calculus • Mean value theorem • Riemann integral • Average Value of a Function **4. Applications of Integration:** • Finding the area between two curves • Volumes of solids of revolution • 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