

School of Engineering and Natural Sciences / Industrial Engineering (English)

2023 - 2024 Academic Year

CALCULUS I

Syllabus

| Course Description | | | | | |
|--|--|---|-------------------------|---------------------------|-------------|
| Name | Code | Semester | T+A Hour | Credit | ECTS |
| CALCULUS I | IND1210745 | Spring Semester | 4+0 | 4 | 6 |
| Prerequisites Courses | | | | | |
| Recommended Elective Courses | | | | | |
| Language of Instruction | English | | | | |
| Course Level | First Cycle (Bachelor's Degree) | | | | |
| Course Type | Required | | | | |
| Course Coordinator | Assist.Prof. Özge BİÇER ÖDEMİŞ | | | | |
| Name of Lecturer(s) | Assist.Prof. Özge BİÇER ÖDEMİŞ | | | | |
| Assistant(s) | | | | | |
| Aim | To teach fundamental math contents, methods and techniques, and its applications for the study of engineering. To provide supports on studies and researches in the area of engineering. | | | | |
| Course Content | This course contains; Functions,Functions,Limits and Continuity,Limits and Continuity,Derivatives,Derivatives,Applications of Derivatives,Applications of Derivatives,Integration,Integration,Applications of Definite Integrals,Applications of Definite Integrals,Transcendental Functions,Improper Integrals. | | | | |
| Course Learning Outcomes | | | Teaching Methods | Assessment Methods | |
| 1. Interpret a function of one variable and its graph to solve the limit graphically, numerically and algebraically | | | 12, 14, 6, 9 | A, E | |
| 2. Apply the notions of continuity and differentiability to algebraic and transcendental functions. | | | 12, 14, 6, 9 | A, E | |
| 3. Compute derivatives of functions by using rules and carry out them in applications such as computing rates of change, finding extreme values, concavity and graphing. | | | 12, 14, 6, 9 | A, E | |
| 4. Apply Fundamental Theorem of Calculus and integration techniques to compute proper integrals. | | | 12, 14, 6, 9 | A, E | |
| 5. Use integration to compute area between curves and volume of a solid. | | | 12, 14, 6, 9 | A, E | |
| 6. Calculate and compare the concept of proper and improper integrals. | | | 12, 14, 6, 9 | A, E | |
| Teaching Methods | 12: Problem Solving Method, 14: Self Study Method, 6: Experiential Learning, 9: Lecture Method | | | | |
| Assessment Methods | A: Traditional Written Exam, E: Homework | | | | |
| Lecture Schedule | | | | | |
| Sequence | Topics | Preliminary Preparation | | | |
| 1 | Functions | Book chapter 1.1, 1.2, 1.4, 1.5 | | | |
| 2 | Functions | Book chapter 1.3, 1.6, 11.1,11.2 | | | |
| 3 | Limits and Continuity | Book chapter 2.1, 2.2, 2.3, 2.4 | | | |
| 4 | Limits and Continuity | Book chapter 2.5, 2.6 | | | |
| 5 | Derivatives | Book chapter 3.2, 3.3, 3.4 | | | |
| 6 | Derivatives | Book chapter 3.5, 3.6, 3.7, 11.2 | | | |
| 7 | Applications of Derivatives | Book chapter 4.1, 4.2, 4.3, 4.4 | | | |
| 8 | Applications of Derivatives | Book chapter 3.11, 4.4, 4.5 | | | |
| 9 | Integration | Book chapter 5.1, 5.2, 5.3, 5.4 | | | |
| 10 | Integration | Book chapter 5.5, 8.1, 8.2, 8.3, 8.4, 8.5 | | | |
| 11 | Applications of Definite Integrals | Book chapter 5.6, 6.1 | | | |
| 12 | Applications of Definite Integrals | Book chapter 6.2, 6.3 | | | |
| 13 | Transcendental Functions | Book chapter 7.1, 7.2 | | | |
| 14 | Improper Integrals | Book chapter 8.8 | | | |
| Evaluation Methods | | Weight(%) | | | |
| Midterm Exam | | 30 | | | |
| General Exam | | 70 | | | |

| Resources |
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| Thomas' Calculus, 12th ed., G. B. Thomas, Jr. and M. D. Weir and J. Hass, Addison-Wesley |