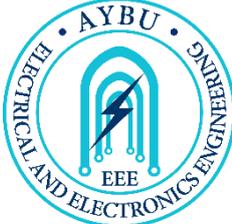


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|---|---|------------|--|---------|--------------------|--------------------|
|  | Course name: MATH102 Calculus II | | Department: Computer, Electrical and Electronics , Mechanical, Metallurgical and Materials, Energy Systems, Industrial, Civil, Aerospace Engineering | | | Semester 2 |
| | Methods of Education | | | | | Credit (ECTS) 6 |
| | Lecture | Study Time | Quiz | Project | Exam (incl. Prep.) | Total |
| | 56 | 74 | 0 | 0 | 50 | 180 |
| Language | English | | | | | |
| Compulsory/Elective | Compulsory | | | | | |
| Prerequisites | Calculus I | | | | | |
| Course Contents | Applications of Integration: Volumes of Solids of Revolution. Conics, Parametric Curves and Polar Curves, Arc Lengths and Areas for parametric Curves. Sequences, Series and Power Series. Vectors and Coordinate Geometry in 3-Space. Functions of Several Variables. Partial Derivatives and its Applications. Multiple Integration. | | | | | |
| Course Objective | <p>This course aims:</p> <ul style="list-style-type: none"> to apply integration techniques in finding the volume, arc length and surface area of a solid to evaluate the first and second partial derivatives of functions of several variables. to find a maximum or minimum value for a function of several variables to evaluate double integrals of functions of several variables. to apply double integration techniques in evaluating volume of a solid. to use double and triple integrals to find volumes. to use change of variables to evaluate double and triple integrals. | | | | | |
| Learning Outcomes and Competences | <p>By the end of this course, a student will be able to:</p> <ol style="list-style-type: none"> determine convergence of improper integrals with discontinuities in their domain or infinite limits of integration interpret a volume of revolution of a function's graph around a given axis as a (Riemann) sum of disks or cylindrical shells express the length of a curve as a (Riemann) sum of linear segments express the surface area of revolution of a function's graph around a given axis as a (Riemann) sum of rings use the concept of polar coordinates to find areas, lengths of curves, and representations of conic sections. use multiple integrals to find volumes | | | | | |
| Textbook and /or References | <p>Main Textbook: Calculus, A Complete Course, Eight Edition, Robert A. Adams, Christopher Essex, Publisher: Pearson, 2013.</p> <p>References:</p> <ol style="list-style-type: none"> Thomas' Calculus 13th Edition by George B. Thomas Jr., Maurice D. Weir and Joel R. Hass, Publisher: Pearson; (2014). Calculus 8th Ed. by James Stewart (Author) Publisher: Cengage Learning. | | | | | |
| Assessment Criteria | | | If any, mark as (X) | | Percentage (%) | |
| | Midterm Exams | | X | | 40 | |
| | Quizzes | | | | | |
| | Homework | | | | | |
| | Projects | | | | | |
| | Laboratory work | | | | | |
| | Other | | | | | |
| Final Exam | | X | | 60 | | |

| Instructors | Prof. Dr. Fatih Koyuncu, Prof. Dr. Gülnihal MERAL, Prof. Dr. Niyazi ŞAHİN, Asst. Prof. Dr. Wesam TALAB, Asst. Prof. Dr. Selim BAHADIR, Asst. Prof. Dr. Nuray ÖKTEM, Asst. Prof. Dr. Ahmet Yücel |
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| Weekly Schedule | |
| Week | Subject |
| 1 | 7 Applications of Integration <ul style="list-style-type: none"> 7.1 Volumes by Slicing—Solids of Revolution 7.2 More Volumes by Slicing |
| 2 | <ul style="list-style-type: none"> 7.3 Arc Length and Surface Area 8 Conics, Parametric Curves, and Polar Curves <ul style="list-style-type: none"> 8.2 Parametric Curves 8.3 Smooth Parametric Curves and Their Slopes |
| 3 | <ul style="list-style-type: none"> 8.4 Arc Lengths and Areas for Parametric Curves 8.5 Polar Coordinates and Polar Curves 8.6 Slopes, Areas, and Arc Lengths for Polar Curves |
| 4 | 9 Sequences, Series, and Power series <ul style="list-style-type: none"> 9.1 Sequences and Convergence 9.2 Infinite series 9.3 Convergence Tests for Positive series |
| 5 | <ul style="list-style-type: none"> 9.4 Absolute and Conditional Convergence 9.5 Power Series |
| 6 | <ul style="list-style-type: none"> 9.6 Taylor and Maclaurin Series 9.7 Applications of Taylor and Maclaurin Series |
| 7 | 10 Vectors and Coordinate Geometry in 3-Space <ul style="list-style-type: none"> 10.1 Analytic Geometry in Three Dimensions 10.2 Vectors 10.3 The Cross Product in 3-Space |
| 8 | <ul style="list-style-type: none"> 10.4 Planes and Lines 10.5 Quadric Surfaces 12 Partial Derivatives <ul style="list-style-type: none"> 12.1 Functions of Several Variables |
| 9 | Mid-term Exam |
| 10 | <ul style="list-style-type: none"> 12.2 Limits and Continuity 12.3 Partial Derivatives 12.4 Higher-Order derivatives |
| 11 | <ul style="list-style-type: none"> 12.5 The Chain Rule 12.7 Gradients and Directional Derivatives |
| 12 | 13 Applications of Partial Derivatives <ul style="list-style-type: none"> 13.1 Extreme Values 13.2 Extreme Values of Functions Defined on Restricted Domains |
| 13 | 14 Multiple Integration <ul style="list-style-type: none"> 14.1 Double Integrals 14.2 Iteration of Double Integrals in Cartesian Coordinates |
| 14 | <ul style="list-style-type: none"> 14.3 Improper Integrals and a Mean-Value Theorem 14.4 Double Integrals in Polar Coordinates |
| 15 | <ul style="list-style-type: none"> 14.5 Triple Integrals 14.6 Change of Variables in Triple Integrals |