TED University

Department of Mathematics

MATH 101 - Calculus of One Variable

2018-2019 Spring

Credit Hours: (3+2+0) 4 TEDU Credits, 7 ECTS Credits

Pre-requisites: None

Course Description:

The concepts of Limit and Continuity, The Derivative, Applications of the Derivative, The Integration, Techniques of Integration, Applications of the Integral.

Instructor:

Fuat Erdem (Section 1 & Section 2)

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Teaching Assistant:

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Textbook:

- Calculus, Metric Version, by James Stewart (8th Edition)

Supplementary Books:

- Calculus, A Complete Course, by Adams and Essex (8th Edition)
- Calculus, by George B. Thomas (12th Edition)
- Calculus, Single and Multivariable, by B. E. Blank & S. G. Krantz (2nd Edition)

Attendance:

Attendance is recommended but not mandatory in this course. Classes start on the hour. Please be respectful of your classmates by being in class on time. Cell phones should be turned off and kept out of sight. Please do not use your computers during class time.

Exam Dates:

Midterm Exam I: 26 March 2019 (Tuesday) at 19:15

Midterm Exam II: 22 April 2019 (Monday) at 19:15

Final Exam: TBA by the University

Grading:

Midterm Exam I: 25%

Midterm Exam II: 25%

Final Exam: 35%

Active Learning Exercises: 10%

Practice Hours: 10%

Extra Credit Works: 5%

Learning Outcomes:

Upon successful completion of this course, a student will be able to:

1. Recall definitions, statements of theorems, certain examples and counterexamples pertaining to functions of one variable.
2. Calculate limits and continuity for functions of one variable.
3. Calculate the derivatives of elementary and transcendental functions of one variable, tangent line, the chain rule, implicit differentiation.
4. Compute the integrals of elementary and transcendental functions of one variable, method of substitution, integration by parts, powers and products of trigonometric functions, trigonometric substitution, partial fractions.
5. Solve problems of related rates, minimum-maximum, linear approximations, graphing functions, length of a curve, planar area, and volume.
6. Practice the basic principles of mathematical writing.

Course Outline:

The course outline is given below. This outline is <u>tentative</u> and will be adapted to the pace of the class. Any changes will be announced either in class or by e-mail.

Week 1	**Feb 11-15**	**1.5** The Limit of a Function **1.6** Calculating Limits using the Limit Laws

Week 2	Feb 18-22	**3.4** Limits at Infinity; Horizontal Asymptotes **1.8** Continuity **2.1** Derivatives and Rates of Change
Week 3	Feb 25-Mar 1	**2.2** The Derivative as a Function **2.3** Differentiation Formulas **2.4** Derivatives of Trigonometric Functions
Week 4	Mar 4-8	**2.5** The Chain Rule **2.6** Implicit Differentiation **2.8** Related Rates
Week 5	Mar 11-15	**2.9** Linear Approximations and Differentials **6.1** Inverse Functions **6.2** Exponential Functions and Their Derivatives **6.3** Logarithmic Functions
Week 6	Mar 18-22	**6.4** Derivatives of Logarithmic Functions **6.6** Inverse Trigonometric Functions **6.7** Hyperbolic Functions
Week 7	Mar 25-29	**6.8** Indeterminate Forms and l'Hospital's rule **3.1** Maximum and Minimum Values **3.2** The Mean Value Theorem
Week 8	Apr 1-5	**3.3** How Derivatives Affect the Shape of a Graph **3.5** Summary of Curve Sketching
Week 9	Apr 8-12	**3.7** Optimization problems **3.9** Antiderivatives **4.1** Areas and Distances **4.2** The Definite Integral
Week 10	Apr 15-19	**4.3** The Fundamental Theorem of Calculus **4.4** Indefinite Integrals and the Net Change Theorem **4.5** The Substitution Rule
Week 11	Apr 22-26	**7.1** Integration by Parts **7.2** Trigonometric Integrals **7.3** Trigonometric Substitution
Week 12	Apr 29-May 3	**7.4** Integration of Rational Functions by Partial Fractions **7.8** Improper Integrals
Week 13	May 6-10	**5.1** Areas Between Curves **5.2** Volumes **5.3** Volumes by Cylindrical Shells
Week 14	May 13-17	**5.5** Average Value of a Function **8.1** Arc length **8.2** Area of a Surface of Revolution

Active Learning Exercises:

Throughout the semester students will be given a number of active learning exercises in class without advance notice. These exercises will help you learn the course material in an active and collaborative manner.

Extra Credit Work:

Students will be given a number of assignments from WeBWork.

Make-up Policy:

Only one make-up exam will be given at the end of the semester. The make-up exam will be given only for medical excuses documented by medical reports that are approved by the Student Health Center or other documented excuses approved by the university's executive branches. No make-up will be given for practice hours, active learning exercises and extra credit works.

Calculator Policy:

You may use a graphing calculator or software that does symbolic calculations. But you will NOT be allowed to use a calculator during active learning exercises and exams.

Cheating:

Cheating has a very broad description which can be summarized as "acting dishonestly". Some of the things that can be considered as cheating are the following: copying answers on exams, homework and lab works, using prohibited material on exams, lying to gain any type of advantage in class, providing false, modified or forged data in a report, plagiarizing, modifying graded material to be re-graded, causing harm to colleagues by distributing false information about an exam, homework or lab. Cheating is a very serious offense and will be penalized accordingly by the university disciplinary committee.

Plagiarism:

All of the following are considered plagiarism:
- Turning in someone else's work as your own
- Copying words or ideas from someone else without giving credit
- Failing to put a quotation in quotation marks
- Giving incorrect information about the source of a quotation
- Changing words but copying the sentence structure of a source without giving credit
- Copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not

Plagiarism is a very serious offense and will be penalized accordingly by the university disciplinary committee. The best way to avoid accidentally plagiarizing is to work on your own before you ask for the help of other resources