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2019-2020 Spring

MATH 117, Calculus I

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Frequency: Fall/Spring Terms

METU Credit & ECTS Credit: (4-2)5 & 7.5

Catalog description: Functions. Limits and Continuity. Tangent lines and derivatives. Chain rule. Implicit differentiation. Inverse functions. Related rates. Linear approximations. Extreme values. Mean Value Theorem and its applications. Sketching graphs. Indeterminate forms and L Hospital s rules. Definite integral. Fundamental Theorem of Calculus. Substitution. Areas between curves. Formal definition of natural logarithm function. Techniques of integration.

Course instructors:
    Section 1 (recitations sections 11): Ahmet Beyaz
    Section 2 (recitations sections 21): İbrahim Ünal

Course teaching assistants: Melis Aslan

Course Home Page: https:/ma117.math.metu.edu.tr/

Grading:

- Midterm 1:   **March 21, 2020 Saturday at 13:30**   30 Points
- Midterm 2:   **April 18, 2020 Saturday at 13:30**   30 Points
- Final: **May 14, 2020 Thursday** at **13:00**   40 Points
- Bonus (from recitations): 5 Points from Quizes (There will be 6 pop quizzes in recitations, the highest 4 of them will be counted.)
    2 Points from Attendance

Suggested textbook:

Robert A. Adams, Christopher Essex
CALCULUS
A Complete Course Calculus. Eight Edition.
ISBN 978 0-321-78107-9
QA303.2.A33 2013

Reference Books: Calculus,
                James Stewart, Eight Edition

Week	Dates	Syllabus(Math 117) 2019-2020 Spring	
1	**Feb 03-07**	**Ch 0: Preliminaries** *0.1 Real Numbers and the Real* *0.2 Cartesian Coordinates in the Plane* *0.3 Graphs of Quadratic* *0.4 Functions and Their Graphs* *0.5 Combining Functions to Make* *0.6 Polynomials and Rational Functions* *0.7 The Trigonometric Functions*	
2	**Feb 10-14**	**Ch 1: Limits and Continuity** 1.2 Limits of Functions 1.3 Limits at Infinity and Infinite Limits	**Suggested exercises from the textbook** **1.2 :** 2,3,4,5,6,11,13,18,22,24,32,56,58, 61,62,63,64 **1.3 :** 3,6,10,14,20,25,29,33,34,50,51
3	**Feb 17-21**	1.4 Continuity 1.5 The Formal Definition of Limit (optional)	**1.4:** 1,2,3,4,5,6,9,13,16,18, 22, 30,32, **1.5 :** 4,6,8,10,12,16,20,27,30, 31,37,38
4	**Feb 24-28**	**Ch 2: Differentiation** 2.1 Tangent Lines and Their Slope 2.2 The Derivative 2.3 Differentiation Rules	**2.1 :** 3, 5, 9, 13, 15, 17, 19, 21, 23 **2.2 :** 1, 3, 11, 17, 23, 25, 27, 31, 35, 37, 41, 43, 45, 47, 49 **2.3 :** 7, 9, 11, 13, 15, 17, 23, 25, 29, 33, 37, 39, 43, 49, 51, 53
5	**March 02-06**	2.4 The Chain Rule 2.5 Derivatives of Trigonometric Functions 2.6 Higher-Order Derivatives	**2.4 :** 3, 5, 11, 13, 15, 19, 23, 25, 31, 37, 45 **2.5 :** 3, 5, 11, 17, 21, 27, 29, 35, 37, 41, 43, 45, 49, 53, 55, 57, 62 **2.6 :** 1, 7, 11, 13, 21, 25, 26
6	**March 09-13**	2.8 The Mean-Value Theorem 2.9 Implicit Differentiation	**2.8 :** 1, 3, 5, 7, 9, 11, 15 **2.9 :** 3, 7, 9, 11, 13, 17, 21, 27
7	**March 16-20**	**Ch 3: Transcendental Functions** 3.1 Inverse Functions 3.5 The Inverse Trigonometric Functions 3.2 Exponential and Logarithmic Functions **Midterm 1:** March 21, 2020 Saturday at 13:30	**3.1 :** 3, 9, 12, 17, 19, 23, 26, 29, 34 **3.5 :** 7, 9, 11, 15, 24, 31, 35, 39, 47 **3.2 :** 7, 17, 26, 31, 32, 35
8	**March 23-27**	3.2 Exponential and Logarithmic Functions 3.3 The Natural Logarithm and Exponential	**3.2 :** 7, 17, 26, 31, 32, 35 **3.3 :** 5, 8, 13, 17, 33, 35, 41, 44, 48, 52, 57, 59, 63, 65
9	**March 30-April 03**	**Ch 4: More Applications of Differentiation** 4.1 Related Rates 4.3 Indeterminate Forms 4.4 Extreme Values	**4.1 :** 1, 2, 3, 4, 5, 6, 7, 13, 14, 22, 26 **4.3 :** 1, 3, 5, 7, 9, 13, 15, 17, 19, 24, 26, 28 **4.4 :** 1, 3, 5, 7, 8, 11, 13, 17, 19, 21, 25, 29, 31, 35, 39
10	**April 06-10**	4.4 Extreme Values 4.5 Concavity and Inflections 4.6 Sketching the Graph of a Function	**4.4 :** 1, 3, 5, 7, 8, 11, 13, 17, 19, 21, 25, 29, 31, 35, 39 **4.5 :** 1, 3, 5, 7, 9, 11, 13, 14, 16, 17, 19, 25, 27, 29, 31, 35, 39 **4.6 :** 1, 2, 3, 4, 5, 6, 15, 16, 17, 18, 29, 31
11	**April 13-17**	4.8 Extreme-Value Problems 4.9 Linear Approximations **Ch 5: Integration** 5.1 Sums and Sigma Notation **Midterm 2:** April 18, 2020 Saturday at 13:30	**4.8 :** 1, 3, 7, 9, 11, 13, 17, 18, 21, 31, 32, 42 **4.9 :** 1, 3, 5, 7, 9, 11, 15, 17, 21 **5.1:** 3, 5, 11, 13, 17, 21, 31, 33
12	**April 20-22 and April 24**	5.2 Areas as Limits of Sums 5.3 The Definite Integral	**5.2:** 3, 7, 13, 17, 19 **5.3:** 2, 3, 5, 7, 11, 13, 15, 17
13	**April 27-30**	5.4 Properties of the Definite Integral 5.5 The Fundamental Theorem of Calculus	**5.4:** 1, 2, 7, 9, 11, 13, 15, 17, 19, 21, 25, 29, 31, 35, 36, 37, 39 **5.5:** 3, 7, 11, 13, 15, 17, 19, 23, 27, 29, 31, 33, 37, 39, 41, 43, 45, 46, 47, 49, 51, 52, 53, 54
14	**May 04-08**	5.5 The Fundamental Theorem of Calculus 5.6 The Method of Substitution 5.7 Areas of Plane Regions	**5.6:** 1, 3, 5, 7, 8, 9, 10, 11, 12, 13, 15, 17, 18, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 40, 41, 43, 44, 45, 47, 48, 49, 50, 51 **5.7:** 3, 5, 9, 11, 15, 17, 19, 21, 23, 29

Final: May 14, 2020 Thursday at **13:00**