King Fahd University of Petroleum & Minerals

Department of Mathematics and Statistics

MATH 341

Instructor: Dr. Brahim Mezerdi
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Course Code:	MATH 341 Location: 59-1007, Time: 2: 00 -2:15 PM
Title:	Advanced Calculus I
Textbook:	**Introduction to Real Analysis** by Robert G. Bartle and Donald R. Sherbert, 4th Ed, Wiley (2011)
Catalogue Description	The real number system. Continuity, limits, uniform continuity and differentiability of functions of one variable. Definition, existence and properties of the Riemann integral. The fundamental theorem of calculus. Sequences and series of real numbers.
Student Learning Outcomes	After completion of the course, the students should be able to: • Analyze a mathematical statement • Identify hypothesis and conclusion (s) from the statement of a mathematical result • Identify the set of mathematical results that lead to the proof of a statement • Compose the arguments leading to the proof of a mathematical statement • Acquire, whenever appropriate, a geometrical feeling of a statement • Apply the results to solve exercises, mostly theoretical in nature • Prepare the students for higher-level analysis courses.
Grading Policy:	HW & Assignments: 30 %, Midterm 1: 35%, Final: 35%.

The **Usage of Mobiles in Class:** Students are not allowed to use mobiles for any purpose during class time. Students who want to use electronic devices to take notes must take permission from their instructor. Violations of these rules will result in a penalty decided by your instructor.

Academic Integrity: All KFUPM policies regarding ethics apply to this course. See the Undergraduate Bulletin.

Week #	MATERIAL
Sept 01-05	2.1 Algebraic and Order Properties of $\mathbb{R}$ 2.2 Absolute Value and the Real Line
Sept 08-12	2.3 Completeness Property of $\mathbb{R}$ 2.4 Applications of the Supremum Property
Sept 15-19	3.1 Sequences and Their Limits 3.2 Limit Theorems
Sept 22-26	3.3 Monotone Sequences 3.4 Subsequences and the Bolzano-Weierstrass Theorem
Sept 29- Oct 03	3.5 Cauchy Criterion 3.6 Properly Divergent Sequences
Oct 06-10	4.1 Limits of Functions 4.2 Limit Theorems
Oct 13 – 17	5.1 Continuous Functions 5.2 Combinations of Continuous Functions
Oct 20-24	5.3 Continuous Functions on Intervals 5.4 Uniform Continuity
Oct 27-31	5.6 Monotone and Inverse Functions 6.1 The Derivative
Nov 03-07	6.2 The Mean Value Theorem 6.3 L' Hospital's Rules
Nov 10-14	6.4 Taylor's Theorem 7.1 Riemann Integral
Nov 17-21	7.2 Riemann Integrable Functions
Nov 24-28	**7.3** The Fundamental Theorem
Dec 01-05	9.1 Absolute Convergence 9.2 Tests for Absolute Convergence
Dec 08-12	9.3 Tests for Non-absolute Convergence 9.4 Series of Functions

Final Exam : Sunday **29 December 2019**, Time : **07 :00 PM – 09 :00 PM**
Location : **TBA**