King Fahd University of Petroleum & Minerals
Department of Mathematics and Statistics
Math 311-Syllabus

2013-2014 (131)

(Course Instructor: **Dr. Adel Khalfallah** ; Office: 5-201-5; email: khelifa@kfupm.edu.sa)

Course:	Math 311
Title:	Introduction to Real Analysis
Textbook:	*Introduction to Real Analysis" by Robert G. Bartle & Donald R. Sherbert, 3rd Ed, Wiley (2000)*
Course description:	The Real Number System, Limits and Continuity, Basic Properties of Functions on R, Elementary Theory of Differentiation, Elementary Theory of Integration, Sequences and series of real numbers.

Objectives: This course is designed to provide a rigorous mathematical basis for the analysis of "Functions of One Variable". Theorems usually stated without proof in elementary calculus courses will be completely proved in this course.

Students Learning Outcome: After completion of the course, the students should be able to:

- Identify hypothesis and conclusion(s) from the statement of a mathematical result
- 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

Instructor: **Dr. Adel Khalfallah**
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Office Hours: **Sunday – Tuesday – Thursday: 09:00 – 09:50 a.m.**
11.00-11.50

Also by Appointment

Exams and Distribution of Marks:

Exam I (25%). Exam II (25%).

Homework and Projects: 15%

Final Exam 35% (Comprehensive): TBA

The DN Grade: According to the university regulation

Week	Date	Section	Material
1	Sep. 1-5, 2013	2.1 2.2	The algebraic and order properties of R Absolute value and real line
2	Sep. 8-12	2.3 2.4	The Completeness Property of R Applications of the Supremum property
3	Sep. 15-19	3.1 3.2	Sequences and their limits Limit Theorems
4	Sep. 22-26	3.3 3.4	Monotone Sequences Subsequences and Bolzano-Weierstrass Theorem
5	Sep. 29-Oct 3	3.5 3.6	The Cauchy Criterion Property Divergent Sequences
6	Oct. 6-10	4.1 4.2	Limits of functions Limit Theorems
Eid Al-Adha Break: Thursday, Oct. 10, 2013 to Sunday, Oct. 20, 2013			
7	Oct. 21-24	5.1 5.2 5.3	Continuous functions Combinations of Continuous functions Continuous functions on Intervals
8	Oct. 27-31	5.4 5.6	Uniform continuity Monotone and Inverse functions
9	Nov. 03-07	6.1 6.2	The Derivative in R The mean value Theorem
10	Nov. 10-14	6.3 6.4	L'Hospital's Rules Taylor's Theorem
11	Nov. 17-21	7.1	The Riemann Integral
12	Nov. 24-28	7.2	Riemann Integrable Functions
13	Dec. 01- 05	7.3	The Fundamental Theorem
14	Dec. 08-12	3.7 9.1	Introduction to Infinite series Infinite Series: Absolute convergence
15	Dec. 15-19	9.2 9.3	Tests for Absolute Convergence Tests for non-absolute convergence
16	Dec. 22- 24		Catch up – Revision