First Semester	Course Syllabus	2014/2015

Course Title	Real Analysis (2)
Course Code	250411
Lecturer	Dr. Khaled Hyasat
Office Room	1013 (Ext. 2214)
Office Hours	STT : from 10:00 to 11:00 & MW : from 09:45 to 10:45
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Course Description

This module is the second part of the Real Analysis two-semester series, covering standard and advanced topics in analysis: differentiation, the Riemann integral, sequences of functions, infinite series, and possibly some generalized Riemann integral.

Topics Weeks

# of Weeks	Topics
4	**Differentiaition:** The Derivative. The Mean Value Theorem. L'Hospital's Rules. Taylor's Theorem.
5	**The Riemann Integral:** Riemann Integral. Riemann Integrable Functions. The Fundamental Theorem. The Darboux Integral. Approximate Intefration.
3	**Sequences of Functions:** Pointwise and Uniform Convergence. Interchange of Limits. The Exponential and Logarithmic Functions. The Trigonometric Functions.
4	**Infinite Series:** Absolute Convergence. Tests for Absolute Convergence. Tests for Nonabsolute Convergence. Series of Functions.

Course Objectives

- Define the derivative and related concepts and illustrate them with typical examples.

- Understand and prove the mean value theorem and L'Hospitals rules.

- Understand the theory of Riemann integral and the fundamental theorems.

- Derive and apply the basic properties of exponential, logarithmic, and trigonometric functions.

- Prove the fundamental theorems for series convergence.

- Apply the generalized Riemann integral and prove the main properties.

Learning Outcomes

- To give the student the necessary information and mathematical tools to deals with mathematical problems and further studies in pure mathematics. Also, to demonstrate the ability of using Real Analysis in solving mathematical problems.

- To identify and solve problems. Work with given information and handle mathematical proofs based on mathematical theorems.

- Encourage the students to be self starters (creativity, decisiveness, initiative) and to finish the mathematical problems properly (flexibility, adaptability). Also to improve general performance of students through the interaction with each other in solving different mathematical problems.
- Gaining knowledge and experience of working with many pure mathematical problems.

Assessment Distribution

Students will be assessed based on a 100 total marks, which are distributed as follows.

Exam Type	Expected Time	Points Allocated
First	19/11/2014 - 27/11/2014	20%
Second	28/12/2014 - 06/01/2015	20%
Quizzes	3 at least	20%
Final	01/02/2015 - 09/02/2015	40%

Textbook and Supporting Materials

– Robert G. Bartle and Donald R. Sherbert, **Introduction to Real Analysis, 4th Edition**, John Wiley & Sons, Inc. 2011. Call number in PU library: 515 BAR.

– H. L. Royden, **Real Analysis, 3rd Edition**, Prentice Hall 1988. Call number in PU library: 515.8 ROY.

Class Attendance

Attendance is expected of every student. Being absent is not an excuse for not knowing about any important information that may have been given in class. Under the University's regulations, a student whose absence record exceeds 15% of total class hours will automatically fail the course. Students who in any way disrupt the class will be expelled from the classroom and will not be allowed to return until the problem has been resolved.

Project Assignments

Students are allowed to work together on a project assignment; however, the work that is turned in by each student must be his own. For instance, a mere copy of another student's work will not be graded. A written project must be properly presented to receive full credit. A late project is penalized one point per day after its due date. A project sent by email will not be accepted.

Late Exams

Late (make-up) exams will be given only to students who have a valid excuse and are able to provide a written document for its verification. The level of difficulty of a late exam is about 50% higher than that of the corresponding regular exam. All late exams will be conducted during the last week of the semester. Each student is allowed only one make-up in a semester, either for the first exam or the second, but not both. There is no make-up for a late exam.

Dishonesty

Any form of dishonest conduct will be strictly punished. A student who is caught cheating, or attempting to do so in an exam will be given a zero for the exam and a report will be written to the Dean for further action. A student who helps another student or is seen communicating with another student in an exam will be given the same penalty stated in the previous point. Students with different exam forms are not exempt from the above rules. Repeat offenders will be expelled permanently and banned from future courses.

− Dr. Khaled Hyasat