

Department of Mathematics

Course Profile

Course Number: MATH 312	Course Title: Intermediate Real Analysis
Required / Elective: Elective	Prerequisite: Math 311
Catalog Description: Differentiation of monotone functions, functions of bounded variations. Differentiation of an integral, absolute continuity. The spaces, Minkowski and Holder inequalities, convergence and completeness. Approximation in bounded linear functionals on the spaces.	Textbook / Required Material: Real Analysis, H.L. Royden, 3rd Edition, Prentice Hall, 1988.
Course Structure / Schedule: (3+0+0) 3 / 6 ECTS	
Extended Description: Lebesgue theorem about differentiation of monotonic functions. Functions of bounded variation and their properties. Lebesgue indefinite integral. Absolute continuous functions. L_2 space. Minkowski and Holder inequalities. Orthogonality in L_2 . Fourier-Bessel expansions. Completeness of L_2 . Linear functionals in L_2 . Weak and strong convergence.	
Design content: None	Computer usage: No particular computer usage required.
<p>Course Outcomes: By the end of the course the students should be able to:</p> <ol style="list-style-type: none"> 1. read and write proofs mathematical statements [1, 6], 2. understand the fundamentals of Lebesgue integral, functional analysis and functional spaces [6]. <p>[1] demonstrate the ability of solving problems by using techniques from calculus, linear algebra, differential equations, probability and statistics,</p> <p>[6] have a basic knowledge of the main fields of mathematics, including analysis, algebra, differential equations, differential geometry.</p>	
Recommended reading: Any textbook on advanced real analysis.	
Teaching methods: Pre-readings and lectures.	
Assessment methods: Midterm exams, final	
Student workload:	
Preparatory reading	60 hrs
Lectures, workshop, discussions	45 hrs
Homework	20 hrs
Midterm Exams	15 hrs
Final Exam	10 hrs
TOTAL 150 hrs ... to match 25 x 6 ECTS	

Prepared by : Elman Hasanođlu	Revision Date : 08.02.2010