

Department of Mathematics

Course Profile

Course Number: MATH 322	Course Title: Special Functions
Required / Elective: Elective	Pre-requisite: none
Catalog Description: Gamma and Beta functions; hypergeometric series and functions; confluent hypergeometric functions, generalized hypergeometric functions; Bessel's functions; Legendre's functions.	Textbook / Required Material: Andrews E.G., Askey R., Roy R. <i>Special Functions</i> . Cambridge University Press, 2000
Course Structure / Schedule: (3+0+0) 3 / 7 ECTS	
Extended Description: Gamma and Beta functions and their properties. Hypergeometric series and functions. Singular Sturm-Liouville problem. Special functions as eigenfunctions of this problem. Generating functions for Bessel and Legendre functions. Orthogonal properties of these functions. Fourier-Bessel expansion.	
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. provide an adequate comprehension and appreciation of the usefulness of special functions. [3, 6] 2. solve problems taken from various areas of engineering and applied physics by using differential equations. [2,3, 6] <p>[2] demonstrate knowledge of mathematics and mechanics to construct, analyze and interpret real world problems, [3] demonstrate the ability to apply mathematics to the solutions of problems, [6] have a basic knowledge of the main fields of mathematics and mechanics, including differential equations, elasticity theory, fluid mechanics,</p>	
Recommended reading: Gradshteyn I.S. ,Ryzhik.I.M. Table of integrals, sums, series and products. Academic press. Abramovitz, M. Stegun. Table of mathematical functions.	
Teaching methods: Pre-readings and lectures.	
Assessment methods: Midterm exams, final exam	
Student workload:	

Preparatory reading	65 hrs
Lectures	45 hrs
Discussions	28 hrs
Homework.....	30 hrs
Midterm Exams	4 hrs
Final Exam	3 hrs
TOTAL	175 hrs ... to match 25 x 7 ECTS

Prepared by: Elman Hasanoglu

Revision Date: 08.02.2010