Course Title	Course Code	Number of Study Hours				Year	Level	Prerequisites
		Theo.	Lab.	Credit	ECTS			
Mathematical Physics	PHYS600	3	-	3	9	1st	1st	-

Student's workload			
In-class activities	Contact Hours	Self-learning/study	Hours
Lectures	45	Preparation for classes	116
Laboratory	-	Case studies	-
Exams and quizzes	5	Working on lab experiment	-
Lab demo	-	HW/Assignments	31
		Study for exam	47
Total	50	Total	194
Total Learning Hours = 244		Equivalent ECTS points = Total LH/28 = 9	

BRIEF COURSE DESCRIPTION

- This course is designed to provide a mathematical foundation for theoretically oriented research areas. It covers basic mathematical tools such as the eigenvalue problem, tensor analysis, transformations and solutions of partial differential equations.

COURSE OBJECTIVES

The main objectives of this course are focused on the following:

1. Perform calculations in vector calculus in different coordinates.
2. Solve eigenvalue problem.
3. Apply matrix theory and tensor analysis to solve problems with many variables.
4. Solve first-order and second-order partial differential equations using various techniques.
5. Apply special functions to carry out various integrations.
6. Perform calculations of complex valued functions and variables including integration.

COURSE CONTENTS

- Vector analysis in different coordinates
- Matrix theory , tensor analysis and eigenvalue problems and orthonormal functions
- Complex variables and functions
- Laplace and Fourier transforms
- Special functions
- Solution of partial differential and integral equations

ASSESSMENT CRITERIA

- Mid-Term exams and Quizzes: 30 %
- Assignments, classroom activities: 20 %
- Final Exam: 50%

COURSE TEACHING STRATEGIES

- Lectures, Discussion, Expository and Discovery, and Interactive Discussions.

TEXT BOOK

- G. Arfken and H. J. Weber, Mathematical Methods for Physicists (Elsevier academic press, 2005).

REFERENCE BOOKS

- J. Matthews and R. L. Walker, Mathematical Methods of Physics (W. A. Benjamin, Inc, 1970).
- P. Dennereyand A. Kryzwicki, Mathematics for Physicists (Dover, 1996).
- G. L. Trigg, Mathematical Tools for Physicists, (John Wiley & Sons, 2006)