

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF MATHEMATICS		
LEVEL OF STUDIES	UNDERGRADUATE PROGRAM		
COURSE CODE		SEMESTER	H
COURSE TITLE	ASYMPTOTIC ANALYSIS		
INSTRUCTOR			
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
		3	4,5
COURSE TYPE	Specialised general knowledge		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	http://www.math.aegean.gr/index.php/en/academics/undergraduate-programs		

(2) LEARNING OUTCOMES

Learning outcomes
<p>On completion of this course, students should be armed with numerous mathematical techniques (not computational ones) for solving a wide variety of initial-value and boundary-value problems that arise in the modelling of realistic phenomena in a big variety of scientific areas.</p> <p>In particular, students will be able to solve frequently occurring small-parameter problems using a combination of asymptotic methods such as matching, multiple scales (in space and time), and series approximations, and the advanced topics should form a solid foundation for potential research students.</p>
General Competences
Working independently. Team work. Working in an interdisciplinary environment.

(3) SYLLABUS

Introduction and basic concepts. Asymptotic expansions. Asymptotic sequence of functions. Laplace's method for integrals. Integration by parts. Watson's lemma. Method of steepest descents. Examples. The method of stationary phase. Integral transformations and asymptotic calculation of integrals. Differential equations, singularities and asymptotic methods of solution. The WKB method. Boundary layer theory. Multiple-scale analysis. The Poincare-Lindstedt method.	
TEACHING MATERIAL DISTRIBUTION	The teaching material of the course is uniformly distributed during the semester.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	<ul style="list-style-type: none"> Communication with students via e-mail 	
TEACHING METHODS	Activity	Semester workload
	Lectures	39

	Independent study	73,5
	Course total (25 per ECTS)	112,5
COURSE COMMITMENTS	Attending course is not obligatory.	
STUDENT PERFORMANCE EVALUATION	Student's evaluation is done in Greek language through a written examination which includes short-answer questions and problem solving. For students with disabilities, evaluation takes place via oral exam.	

(5) ATTACHED BIBLIOGRAPHY

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| <p>1. E.J. Hinch, <i>Perturbation methods</i>, Cambridge University Press, 1991.
 - <i>Related academic journals: Asymptotic Analysis.</i></p> |
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