Program	Level	First cycle
	Name of the program	Theoretical Computer Science

COURSE

Course title	**Selected Topics in Analysis**			
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)
PMAT235	III	Mandatory course	6	3+3+0
Lecturer				

Course Goals	The aim of the course is to enable students to expand knowledge acquired through the courses Analysis I and Analysis II in the case of functions of several real variables and functions of complex variables. The focus of the course is on mastering the techniques of differential and integral calculus of functions of several real variables and functions of complex variable.
Learning Outcomes	Upon successful completion of this course, students are expected to: - understand the basic concepts of functions of several real variables and functions of a complex variable - master and perform the basic techniques of differential calculus of functions of several real variables and be able to apply them to solve real-life problems - master and perform the methods of calculating multiple, line and surface integrals, as well as basic methods of integrating functions of a complex variable - understand the concepts of Fourier and Laplace transform and be able to apply them to solve real-life problems

COURSE CONTENT

- Functions of several real variables. Partial derivatives. Local extrema. Conditional extrema.
- Multiple integrals and applications.
- Line integrals of the first and second kind and applications.
- Surface integrals of the first and second kind and applications.
- Green's and Stokes' theorems and applications.
- Functions of a complex variable.
- Integration of complex variable functions. The Residue Theorem.
- Fourier series.
- Fourier transform.
- Laplace transform.

LITERATURE

[1] S. R. Ghorpade, B. V. Limayeand: A Course in multivariable calculus and analysis, Springer, 2009.
[2] E. Kreyszig, H. Kreyszig, E. J. Norminton: Advanced engineering mathematics (10th ed.), John Wiley & Sons, Inc, 2011.
[3] J. Marsde, A. Weinstein, Calculus III, Springer, 1985.
[4] D. G. Duffy, Advanced engineering mathematics, CRC Press, 1998.

STUDENT WORKLOAD (hours in a semester)

Lectures	45	Tutorial	45	Individual work	60	T o t a l	150

GRADING			**REMARKS**
Criterion	Maximum points	Minimum points	
Midterm exams	50	25	
Final exam	50	25	
T o t a l	100	55	