SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Automation and Computer Science
1.3	Department	Mathematics
1.4	Field of study	Electronics and Telecommunications Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Telecommunications Technologies and Systems/ Engineer, Applied Electronics/ Engineer
1.7	Form of education	Full time
1.8	Subject code	TST-E01.00, EA-E01.00

2. Data about the subject

2.1	Subject name					Mathematical Analysis					
2.2	Subject area					Mathematics					
2.3	Course responsible/lecturer					Prof. mat. Dorian POPA, PhD					
2.4	Teachers in charge of applications					Prof. mat. Dorian POPA, PhD					
2.5	Year of study	I	2.6	Semester	1	2.7	Assessment	Exam	2.8	Subject category	DF/ DOB

3. Estimated total time

Year/ Sem.	Subject name	No. of weeks	Course [hours/week]	Applications [hours/week]			Course [hours/sem.]	Applications [hours/sem.]			Indiv. study	TOTAL	Credits
				S	L	P		S	L	P			
I / 1	Mathematical Analysis	14	2	2			28	28			74	130	5

3.1	Number of hours per week	4	3.2	of which, course	2	3.3	applications	2
3.4	Total hours in the curriculum	42	3.5	of which, course	28	3.6	applications	28

Individual study	Hours
Manual, lecture material and notes, bibliography	40
Supplementary study in the library, online and in the field	-
Preparation for seminars/laboratory works, homework, reports, portfolios, essays	28
Tutoring	3
Exams and tests	3
Other activities	0

3.7	Total hours of individual study	74
3.8	Total hours per semester	130
3.9	Number of credit points	5

Acquired competences :
Acquired skills (what the student is able to do):
Notions and concepts concerning sequences, series, power series, complex functions, trigonometric and Fourier series, metric spaces, partial derivatives, local extrema, conditional extrema, implicit functions.
Acquired abilities: (what type of equipment/instruments/software the student is able to handle)
■ To operate with numerical and functions series. ■ To operate with the concepts of metric spaces. ■ To operate with partial derivatives and the differential of a function. ■ To determine the local extrema and the conditional extrema of functions. ■ To operate with implicit functions.

Prerequisites (if necessary)

Elementary notions on mathematical analysis, algebra and trigonometry.

A. Course/Lecture (course/lecture titles)	
	Course 1 – The sets R and C. Sequences. Course 2 –Series of real and complex numbers. Course 3 – Series with positive terms. Course 4 – Sequences and series of functions. Power series. Course 5 Taylor formula. Taylor series.Complex elementary functions. Course 6– Trigonometric series. Fourier series. Course 7 – Metric spaces. Topology of a metric space. Course 8 - Partial derivatives. The directional derivative. Course 9 –The differential of a function. Course 10 – Local extrema of a function. Course 11 – Implicit functions. Course 12- Conditional extrema. Course 13 – Improper integrals. Course 14 – Integrals delpendent on parameters.

B1. Applications – **Laboratory** (list of laboratories), **Seminar** (contents), **Project** (project contents)	
1	Seminar 1 – Sequences of real and complex numbers. Seminar 2 – Series of real numbers. Seminar 3 – Series of complex numbers Seminar 4 – Series of functions. Seminar 5 – Power series. Applications. Seminar 6 – Complex functions. Applications. Seminar 7 – Trigonometric series. Fourier Series. Seminar 8 – Metric spaces. Applications Seminar 9 – Partial derivatives Seminar 10 – Problems with partial derivatives. Seminar 11 – Local extrema. Seminar 12 – Implicit functions Seminar 13 – Conditional extrema. Seminar 14 – Generalized integrals.
C. Individual study (reference study contents, synthesis materials, projects, applications etc.)	
2 synthesis reports 12 sets of problems (the preparation part in every laboratory) 3 sets of problems (course homework)	
References (Textbooks, courses, laboratory manual, exercise book)	
1. Dorian Popa, Calculus – Mediamira Cluj-Napoca, 2006. 2. O. Stănăşilă, Analiză matematică, EDP Bucureşti, 1981. 3. N. Vornicescu, D.M.Ivan, D. Popa, Calculul diferenţial, Editura Mediamira, 2004. 4. M. Ivan, Calculus, Mediamira Cluj-Napoca, 2004. 5. G.N.Berman, A problem book in Mathematical Analysis, Mir Publisher , Moscow,1977.	

Final evaluation	
Evaluation method	Writen paper – 3 hours containing theory and problems. After 7 courses partial evaluation (3 hours)
Mark components	Seminar S Theory T Problems P
Mark computation	N=0,2S+0,2T+0,6P

Date of filling in 18.03.2015

Course responsible
Prof. Dorian POPA, PhD

Teachers in charge of applications
Prof. Dorian POPA, PhD

Date of approval in the department
18.03.2015

Head of department
Prof. Mircea IVAN, PhD