SYLLABUS

Discipline name	Mathematical Analysis
Profile	Electronics and Telecommunications Engineering
Specialization	Telecommunications Technologies and Systems
Code	51320109
Course leader	Prof. Dorian Popa, Ph.D., dorian.popa@math.utcluj.ro
Collaborators	Lecturer Adela Chis, Ph.D., adela.chis@math.utcluj.ro
Department	Mathematics
Faculty	Automation and Computer Science

Sem.	Type of discipline	Course	Applications			Course	Applications			Ind. study	TOTAL	Credits	Form of assessment
		[hours/week]				[hours/sem.]							
			S	L	P		S	L	P				
1	**Fundamental**	2	2		-	28	-	28	-	94	150	5	**Exam**

Acquired competences :
Acquired skills (what the student is able to do):
Motions and concepts concerning sequences, series, power series, complex functions, trigonometric and Fourier series, metric spaces, partial derivatives, local extremum, conditional extremum, 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 functions.   ■ To determine the local extremum and the conditional extremum of functions.   ■ To operate with implicit functions.   ■ To operate with improper integrals

Prerequisites (if necessary)
Notions on mathematical analysis, algebra and trigonometry from high school

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 extremum of a function.   Course 11 – Implicit functions.   Course 12- Conditional extremum.   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 sequences of complex numbers Seminar 2 – Series of real numbers Seminar 3 – Series of complex numbers Seminar 4 – Series functions. Uniform convergence 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 – Problem with partial derivatives Seminar 11 – Local extremum Seminar 12 – Implicit functions Seminar 13 – Conditional extremum Seminar 14 – Generalized integrals.

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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)						
Individual study structure	Course study	Problem solving, laboratory, project	Applications preparation	Examination time	Additional reference study	Total no. of individual study hours
Hours	28	6	18	3	9	64

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, Calcul 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

Course leader,

Prof. Dorian POPA, Ph.D.