

SYLLABUS¹

Mathematics 1

1. Information about the program

1.1 Higher education institution	"POLITEHNICA" UNIVERSITY OF TIMIȘOARA
1.2 Faculty ² / Department ³	ELECTRONICS AND TELECOMMUNICATIONS/MATHEMATICS
1.3 Chair	—
1.4 Field of study (name/code ⁴)	ELECTRONICS AND TELECOMMUNICATIONS (IN ENGLISH)
1.5 Study cycle	LICENSE
1.6 Study program (name/code)/Qualification	

2. Information about the discipline

2.1 Name of discipline	Mathematics I						
2.2 Coordinator (holder) of course activities	Assoc. Prof. Ph.D. Dan Dăianu						
2.3 Coordinator (holder) of applied activities ⁵	Asst. Prof. Ph.D. Andrei Eckstein						
2.4 Year of study ⁶	I	2.5 Semester	1	2.6 Type of evaluation	Exam	2.7 Type of discipline	Fundamental

3. Total estimated time (hours / semester of didactic activities)

3.1 No. of hrs. / week	4 , of which:	3.2 course	2	3.3 seminar/laboratory/ project/training	2
3.4 Total no. of hrs. in the education curricula	56 , of which:	3.5 course	28	3.6 applied activities	28
3.7 Distribution of time for individual activities related to the discipline					hrs.
Study using a manual, course materials, bibliography and lecture notes					25
Additional documentation in the library, on specialized electronic platforms and on the field					15
Preparation for seminars / laboratories, homework, assignments, portfolios, and essays					35
Tutoring					2
Examinations					10
Other activities					
Total hrs. of individual activities					87
3.8 Total hrs. / semester ⁷	143				
3.9 No. of credits	4				

4. Prerequisites (where applicable)

4.1 Curriculum	<ul style="list-style-type: none"> mathematics taught in high school
4.2 Competencies	<ul style="list-style-type: none"> mathematical and computational thinking skills

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none">
5.2 to conduct practical activities	<ul style="list-style-type: none">

6. Specific competencies acquired

¹ The form corresponds to the Syllabus promoted by OMECTS 5703/18.12.2011 (Annex3).

² The name of the faculty which manages the educational curriculum to which the discipline belongs.

³ The name of the department entrusted with the discipline, and to which the course coordinator / holder belongs.

⁴ Fill in the code provided in GD no. 493/17.07.2013.

⁵ The applied activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).

⁶ The year of study to which the discipline is provided in the curriculum.

⁷ It is obtained by summing up the number of hrs. from 3.4 and 3.7.

Professional competencies ⁸	<ul style="list-style-type: none"> • Utilizarea elementelor fundamentale referitoare la dispozitivele, circuitele, sistemele, instrumentația și tehnologia electronică • Aplicarea metodelor de bază pentru achiziția și prelucrarea semnalelor • Selectarea, instalarea, configurarea și exploatarea echipamentelor de telecomunicații fixe sau mobile și echiparea unui amplasament cu rețele uzuale de telecomunicații. • Rezolvarea problemelor specifice pentru rețele de comunicații de bandă largă: propagare în diferite medii de transmisiune, circuite și echipamente pentru frecvențe înalte (microunde și optice).
Transversal competencies	<ul style="list-style-type: none"> •

7. Objectives of the discipline (based on the grid of specific competencies acquired)

7.1 General objective of the discipline	<ul style="list-style-type: none"> • Construction of a mathematical fundament, basis for future studies. Understanding the conceptual notions of differential calculus.
7.2 Specific objectives	<ul style="list-style-type: none"> • Knowing the different applications of differential calculus. Developing the skills of solving concrete problems using mathematical analysis. Gaining skills for selecting and combining mathematical results of the differential calculus to solve specific engineering problems.

8. Content

8.1 Course	No. of hours	Teaching methods
Functions of a single variable		exposure,
Sequences	4	conversation,
Numerical Series	2	explanation,
Polynomial approximations. Applications	2	example,
Series of functions	2	proof, comparative
Power Series. Taylor series	2	analysis,
Fourier Series	2	case study.
Functions several variables		
Elements of Topology. Sequences	2	
Limits and Continuity	2	
Differentiability	4	
Implicite functions. Change of variables	2	
Taylor's Formula. Applications	4	
Bibliography ⁹		
<ol style="list-style-type: none"> 1. Dăianu D., Mathematical Analysis, Ed. Politehnica, 2014. 2. Dăianu D., Calculus, course and problems online, https://sites.google.com/site/ddcalculus/ 3. Dăianu, D. A Course in Advanced Calculus, Ed. Eubee, 2009. 4. Torrence, B.F., A handbook for precalculus, calculus, and linear algebra, Cambridge University Press, 2009. 5. Cohen, G.L., A course in modern analysis and its applications, University Press, 2003. 		
Chenez W., Analysis for applied mathematics, Springer. 2001.		

⁸ The professional competencies and the transversal competencies will be treated according to the Methodology of OMECTS 5703/18.12.2011. The competencies listed in the National Register of Qualifications in Higher Education [Registrul Național al Calificărilor din Învățământul Superior RNCIS] (http://www.ncis.ro/portal/page?_pageid=117,70218&_dad=portal&_schema=PORTAL) will be used for the field of study from 1.4 and the program of study from 1.6 of this form, involving the discipline.

⁹ At least one title must belong to the department staff teaching the discipline, and at least 3 titles must refer to national and international works relevant for the discipline, and which can be found in the Politehnica University Library.

8.2 Applied activities ¹⁰	No. of hours	Teaching methods
Seminar		
Numerical Sequences and Series	6	conversation,
Polynomial approximations. Applications	2	example,
Series of Functions	6	comparative
Elements of Topology. Sequences. Limits and Continuity	4	analysis,
Differentiability	4	case study.
Implicite functions. Change of variables	2	
Taylor's Formula. Applications	4	
Bibliography ¹¹		
1. Dăianu D., Mathematical Analysis, Ed. Politehnica, 2014. 2. Dăianu D., Calculus, course and problems online, https://sites.google.com/site/ddcalculus/ 3. Dăianu, D. A Course in Advanced Calculus, Ed. Eubeea, 2009.		

9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

<ul style="list-style-type: none"> Course content provides the necessary knowledge of calculus to solve specific engineering problems.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Testing theoretical knowledge. Testing skills to solve practical problems.	Written exam. Solving of five general and simple problems with applicative tint and five concrete exercises.	2/3
10.5 Applied activities	S: Check-solving skills of differential calculus problems.	Two tests, homework, tests routine activity on board.	1/3
	L:		
	P:		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified)			
<ul style="list-style-type: none"> · Knowledge of the practical calculation of sequences limits and of the techniques for the study of convergence of the series - two problems. · Knowledge of the practical calculation of partial derivatives and differentials for the basic functions - two problems. · Knowledge of the optimization techniques using polynomial approximations - a problem. 			

Date of completion

05.03.2015

Course coordinator

Assoc. Prof. Ph.D. Dan Dăianu



Coordinator of applied activities

Asst. Prof. Ph.D. Andrei Eckstein



¹⁰ The types of applied activities are those specified in footnote 5. If the discipline contains several types of applied activities, then these will be written consecutively in the lines of the table below. The type of activity will be written in a distinct line, as „Seminar:”, „Laboratory:”, „Project:” and/or „Practice/Training:”.

¹¹ At least one title must belong to the staff teaching the discipline.

Head of Department
Assoc. Prof. Ph.D. Ioan Goleş



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Date of approval in the Faculty
Council¹²

Dean
(signature)

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¹² Avizarea este precedată de discutarea punctului de vedere al board-ului de care aparține programul de studiu cu privire la fișa disciplinei.