

SYLLABUS ¹

1. Information about the program

1.1 Higher education institution	POLITEHNICA UNIVERSITY OF TIMISOARA
1.2 Faculty ² / Department ³	CIVIL ENGINEERING / DEPARTMENT OF MATHEMATICS
1.3 Chair	—
1.4 Field of study (name/code ⁴)	CIVIL ENGINEERING /80
1.5 Study cycle	Bachelor
1.6 Study program (name/code/qualification)	Civil Engineering in English/10/Engineer

2. Information about the discipline

2.1 Name of discipline/ formative category ⁵	MATHEMATICS 1 / DF						
2.2 Coordinator (holder) of course activities	Sl. Dr. Eckstein Andrei						
2.3 Coordinator (holder) of applied activities ⁶	Sl. Dr. Eckstein Andrei						
2.4 Year of study ⁷	I	2.5 Semester	1	2.6 Type of evaluation	E	2.7 Type of discipline ⁸	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) ⁹

3.1 Number of fully assisted hours / week	4 of which:	3.2 course	2	3.3 seminar / laboratory / project	2
3.1* Total number of fully assisted hours / semester	56 of which:	3.2* course	28	3.3* seminar / laboratory / project	28
3.4 Number of hours partially assisted / week	of which:	3.5 training		3.6 hours for diploma project elaboration	-
3.4* Total number of hours partially assisted / semester	of which:	3.5* training		3.6* hours for diploma project elaboration	-
3.7 Number of hours of unassisted activities / week	2 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0,5
		hours of individual study after manual, course support, bibliography and notes			1
		training seminars / laboratories, homework and papers, portfolios and essays			0,5
3.7* Number of hours of unassisted activities / semester	28 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			7
		hours of individual study after manual, course support, bibliography and notes			14
		training seminars / laboratories, homework and papers, portfolios and essays			7
3.8 Total hours / week ¹⁰	6				
3.8* Total hours /semester	84				
3.9 Number of credits	4				

4. Prerequisites (where applicable)

¹ The form corresponds to the Discipline File promoted by OMECTS 5703 / 18.12.2011 and to the requirements of the ARACIS Specific Standards valid from 01.10.2017.

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 The code provided in HG no.140 / 16.03.2017 or similar HGs updated annually shall be entered.

⁵ Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).

⁶ Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).

⁷ Year of studies in which the discipline is provided in the curriculum.

⁸ Discipline may have one of the following regimes: imposed discipline (DI), optional discipline (DO) or optional discipline (Df).

⁹ The number of hours in the headings 3.1 *, 3.2 *, ..., 3.8 * is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≥ 28 hours / wk. and (3.8) ≤ 40 hours / wk.

¹⁰ The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

4.1 Curriculum	<ul style="list-style-type: none"> College-level Mathematics; Calculus
4.2 Competencies	<ul style="list-style-type: none">

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 through this discipline

Specific competencies	<ul style="list-style-type: none"> Acquire knowledge about conceptual notions of differential calculus
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> Design of structural elements in civil engineering, specific to graduated study programme Technological and economical design for the erection, operation and maintenance works in civil engineering, specific to graduated study programme Organization and management of the execution, operation and maintenance procedures for civil, industrial and agricultural constructions
Transversal competencies ascribed to the specific competencies	<ul style="list-style-type: none"> Documentation in Romanian and foreign language, in view of professional and personal development, via continuous learning and efficient adaptation to the new technical specifications

7. Objectives of the discipline (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	<ul style="list-style-type: none"> <i>The goal of this course is to build a mathematical foundation for future study. To understand the conceptual notions of differential calculus.</i>
7.2 Specific objectives	<ul style="list-style-type: none"> <i>The main goal of the course is to know common situations when differential calculus is useful and to apply it. To have a founded confidence about their problem solving abilities using differential calculus.</i>

8. Content ¹¹

8.1 Course	Number of hours	Teaching methods ¹²
Functions of a real variable: <i>Numeric series. Taylor's formula. Applications to approximation problems. Sequences and series of functions. Power series. Fourier series</i>	12	Disquisition, lecture, dialog, explanation, example
Functions of several real variables: <i>\mathbb{R}^p space. Limits and continuity for maps of several variables. Partial derivatives. The differential of a map. Extrema problems. Approximation of functions of several variables</i>	16	
Bibliography ¹³		
<ol style="list-style-type: none"> D.Dăianu, <i>Analiză matematică</i>, Editura MATRIX ROM București, 2005; R.Borden, <i>A Course in Advanced Calculus</i>, Ed. North-Holland, 1983; L.D. Lemle, <i>Lecții de Analiză Matematică pentru ingineri</i>, Editura Politehnica, Timișoara, 2010. 		
8.2 Applied activities ¹⁴	Number of hours	Teaching methods

¹¹ It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".

¹² Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

¹³ At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.

Numeric series.	2	Solving problems, explanation, example, conversation, homework
Taylor's formula.	4	
Sequences and series of functions.	2	
Power series.	2	
Fourier series.	2	
Limits and continuity for maps of several variables.	4	
Partial derivatives. The differential of a map.	4	
Extrema problems.	2	
Approximation of functions of several variables.	4	

Bibliography ¹⁵

1. P.Găvrută, D.Daianu, C.Lăzureanu, L.Cădariu, L.Ciurdariu, *Probleme de matematică, Calcul diferențial*, Ed. MIRTON Timișoara, 2004;
2. D.M. Stoica, L.D. Lemle, S. Maksay, *Analiză Matematică. Calcul diferențial. Culegere de probleme*, Editura Politehnica, Timișoara, 2009;
3. D. Bistriean, L.D. Lemle, *Culegere de probleme de ecuații diferențiale*, Editura Politehnica, Timișoara, 2016.

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

- Understanding the correct use of mathematical and engineering sciences is essential.
- Discipline creates special mathematical skills of students on which they will be able to meet the requirements of the labor market in various areas or to continue research in the higher stages of study

10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁶	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Four problems	Written Exam	50%
10.5 Applied activities	S: Two problems for each test	Written tests and oral examination	50%
	L: -		
	P¹⁷: -		
	Pr: -		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified ¹⁸)			
<ul style="list-style-type: none"> • 50% 			

Date of completion

25.01.2018

Head of Department
(signature)



Course coordinator
(signature)

Date of approval in the Faculty
Council ¹⁹

12.02.2018

Coordinator of applied activities
(signature)

Dean
(signature)



¹⁴ Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".

¹⁵ At least one title must belong to the discipline team.

¹⁶ Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

¹⁷ In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.

¹⁸ It will not explain how the promotion mark is awarded.

¹⁹ The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.