SYLLABUS[1]

1. Information about the program

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

2. Information about the discipline

2.1 Name of discipline	MATHEMATICS IV (MATHEMATICS ASSISTED BY COMPUTER)						
2.2 Coordinator (holder) of course activities	Lecturer PhD. Maria – Anastasia JIVULESCU						
2.3 Coordinator (holder) of applied activities [5]	Lecturer PhD. Maria – Anastasia JIVULESCU						
2.4 Year of study[6]	1	**2.5** Semester	2	**2.6** Type of evaluation	D	**2.7** Type of discipline	Required

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	1/1
3.4 Total no. of hrs. in the education curricula	113 , 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					22
Additional documentation in the library, on specialized electronic platforms and on the field					14
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays					21
Tutoring					14
Examinations					-
Other activities					3
Total hrs. of individual activities					57

3.8 Total hrs. / semester[7]	130
3.9 No. of credits	4

4. Prerequisites (where applicable)

4.1 Curriculum	• -
4.2 Competencies	• Knowledge of: Mathematical Analysis, Linear Algebra and Geometry

5. Conditions (where applicable)

5.1 of the course	• Large lecture hall, video projector, whiteboard
5.2 to conduct practical activities	• Lab with 20 computers, software Matlab

6. Specific competencies acquired

Professional competencies[8]	• The students acquire notions of mathematics necessary in engineering applications: Laplace transform for solving difference equations (ex. RLC systems), Fourier transform and distribution theory for signals theory.
Transversal competencies	• Methodical analysis of problems encountered in work, identifying items for which there are dedicated solutions, thus ensuring professional tasks. • Defining stages and their distribution activities of subordinates with full explanation of duties, depending on hierarchical levels, ensuring effective information sharing and interpersonal communication.

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

7.1 General objective of the discipline	• The assimilation by students of the methods and knowledge of special mathematics used in electronic engineering and the ability of using MATLAB software.
7.2 Specific objectives	•

8. Content

8.1 Course	No. of hours	Teaching methods
Complex functions: Elementary complex functions; Holomorphic functions; Curve (contour) integral in the complex plane; Series expansions; Residues; Applications of Residues theorem.	9	Explanations and solving problems at blackboard, practice exercises with Matlab
Integral operators: Fourier Transform; Laplace Transform; Z Transform.	8	Explanations and solving problems at blackboard, practice exercises with Matlab
Distributions: Definition of the distribution; Remarkable examples; Operations with distributions; Tempered distributions	5	Explanations and solving problems at blackboard
Probability and stochastic processes: Introduction into Probability Theory; Random variables; Stochastic processes-Markov chains, Mathematical statistics	6	Explanations and solving problems at blackboard, practice exercises with Matlab

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Bibliography[9]

1. Thomas B.A. Senior, *Mathematical Methods in Electrical Engineering*, Cambridge University Press, 1986

2. V. Rudner, C. Nicolescu, *Probleme de matematici speciale,* Editura Didactica si Pedagogica, Bucuresti 1982

3. 3. P. Naslau, R.Negrea, L.Cadariu, B. Caruntu, s.a., *Matematici asistate de calculator*; Editura Politehnica, Timisoara, 2005, (2nd ed.2006, 3rd ed. 2007) (in Romanian).

4. 4. P. Gavruta, R. Negrea, L. Cadariu, L. Ciurdariu, *Matematici pentru ingineri*; Editura Politehnica, Timisoara, 2008. (in Romanian).

8.2 Applied activities[10]	No. of hours	Teaching methods
Seminaries: Problems for Complex functions;	5	Explanations and solving problems at blackboard
Problems for integral transforms;	4	Explanations and solving problems at blackboard
Problems for distribution;	2	Explanations and solving problems at blackboard
Problems with discrete and continuous random variable; Descriptive statistics.	3	Explanations and solving problems at blackboard
Laboratories: Numerical methods. Probability and stochastic processes in MATLAB: Introduction to Matlab software;	2	Practice exercises with Matlab
Numerical solutions for nonlinear equations; Numerical integration ;	2	Practice exercises with Matlab
Numerical solutions for differential equations; Interpolation and approximation functions;	4	Practice exercises with Matlab
Classical schemes ; Descriptive statistics;	2	Practice exercises with Matlab
Simulation of the random variables; Simple paths for stochastic processes.	4	Practice exercises with Matlab

Bibliography [11]

1. R. Negrea, B.Caruntu, C. Hedrea, *Advanced Calculus in Egineering*, Ed. Politehnica, 2009 .

2. http://ocw.mit.edu/OcwWeb/Mathematics/
3. V. Rudner, C. Nicolescu, *Probleme de matematici speciale,* Editura Didactica si Pedagogica, Bucuresti 1982

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

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10. Evaluation

Type of activity	**10.1** Evaluation criteria	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course		Distributed evaluation – two written	50 % of the final

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[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.

[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.

		examination (1.5 hours for each part).	grade
10.5 Applied activities	**S:**	Home-works and in-class evaluations during the term	25% of the final grade
	L:		25% of the final grade
	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)			
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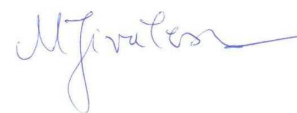| **Date of completion**	**Course coordinator (signature)**	**Coordinator of applied activities (signature)**
Fabruary, 25, 2015	……………………….………	……………………….………

Head of Department (signature)	**Date of approval in the Faculty Council[12]**	**Dean (signature)**
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[12] Avizarea este precedată de discutarea punctului de vedere al board-ului de care aparţine programul de studiu cu privire la fişa disciplinei.