

SYLLABUS₁

1. Information about the program

1.1 Higher education institution	Universitatea "POLITEHNICA" din Timișoara
1.2 Faculty ₂ / Department ₃	ELECTRONICA SI TELECOMUNICATII/ Electronica Aplicata
1.3 Chair	—
1.4 Field of study (name/code ₄)	Inginerie electronică și telecomunicații/ L20202010020
1.5 Study cycle	Bachelor
1.6 Study program (name/code)/Qualification	PI/ inginer

2. Information about the discipline

2.1 Name of discipline	Electronic Circuits						
2.2 Coordinator (holder) of course activities	S.I.dr ing. Maranescu Valentin						
2.3 Coordinator (holder) of applied activities ₅	S.I.dr ing. Maranescu Valentin						
2.4 Year of study ₆	II	2.5 Semester	1	2.6 Type of evaluation	E	2.7 Type of discipline	Mandatory

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					20
Additional documentation in the library, on specialized electronic platforms and on the field					10
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays					14
Tutoring					7
Examinations					3
Other activities					
Total hrs. of individual activities					44
3.8 Total hrs. / semester ₇	100				
3.9 No. of credits	5				

4. Prerequisites (where applicable)

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.

4.1 Curriculum	<ul style="list-style-type: none"> • Electronic Devices
4.2 Competencies	<ul style="list-style-type: none"> • Elementary Highschool Physics and Math

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> • Notebook, beamer, whiteboard
5.2 to conduct practical activities	<ul style="list-style-type: none"> • Lab with minimum 5 working places (with specific electronic equipment and computers)

6. Specific competencies acquired

Professional competencies [§]	<ul style="list-style-type: none"> • Description and operation of electronic devices and circuits and of the fundamental methods for measuring electrical quantities • Analysis of the low / medium complexity electronic circuits in order to design and measure them
Transversal competencies	<ul style="list-style-type: none"> • Methodical analysis of the problems encountered in work, identifying the items for which state of the art solutions are established, thus ensuring professional tasks achieving

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"> • Theoretical and practical introduction to electronic circuits. Study of amplifiers and oscillators circuits. Theory of negative feedback, stability and frequency compensation
7.2 Specific objectives	<ul style="list-style-type: none"> • Solving electronic circuits with active devices • measurement and determination of electronic circuits parameters using oscilloscopes, signal generators, voltage supplies, multimeters • Using computed aided design for electronic circuits analysis

8. Content

8.1 Course	No. of hours	Teaching methods
1. Introduction. Discrete Amplifier, Amplifier in DC and AC regime. Small Signal BJT and MOSFET models. Multistage amplifiers.	2	Lecture sustained by PPT presentation, conversations, explanations, examples
2. BJT and MOSFET amplifier topologies and schematics	4	

[§] 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.rncis.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.

3. Frequency response of an amplifier. Bode plots, OCTC, SCTC analysis methods. Miller effect and theorem. Amplifiers Time response	4	
4. Power amplifier stages. Push-pull stage: efficiency, crossover distortion, biasing, thermal dissipation. High efficiency output stages. Class D output stage: structure and topologies	4	
5. Feedback in amplifiers and circuit design. Uses of basic feedback topologies for amplifiers	6	
6. Amplifiers stability. Stability analysis for amplifiers and frequency compensation. Noise sources.	4	
7. Positive feedback and Oscillators. Oscillators topologies and uses	4	
Bibliography ⁹		
[1] V. Maranescu, Course Notes, 2014.		
[2] C.-D. Căleanu, V. Tîpouț, V. Maranescu, A. Filip, Electronic Devices, Politehnica Publishing House, 2010.		
[3] Thomas L. Floyd, Electronic Devices, Electron Flow - Fifth Edition, USA, Pearson/Prentice Hall, Upper Saddle River, NJ, 2005.		
[4] R. Boylestad, L. Nashelsky, Electronic Devices and Circuit Theory, 7th Edition, Prentice Hall, 1998		
8.2 Applied activities¹⁰	No. of hours	Teaching methods
1. Recall BJT&FET biasing, small signal models, equivalent schematics rules	2	
2. Small signal BJT amplifier	2	
3. Small signal midband frequency amplifier analysis	2	
4. The effect of coupling and bypass capacitors over the amplifier frequency response	2	
5. Amplifier frequency response (Time constant Methods)	2	

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:”.

6. Complementary-Symmetry power amplifier (Push-Pull stages)	2	
7. Power amplifiers	2	
8. The effect of negative feedback	2	
9. Feedback amplifiers. Shunt-Shunt topology.	2	
10. Small signal series-shunt amplifier	2	
11. Feedback amplifiers. Series-Shunt topology.	2	
12. Wien-bridge RC oscillators	2	
13. RC oscillators	2	
14. Make up lab	2	

Bibliography ¹¹

1. C.D. Căleanu, A. Filip, V. Tîpînut – “Dispozitive și Circuite Electronice. Experimente și Simulare”, Editia a doua revizuita și adăugita, ISBN 978-606-554-160-3, 195 pagini, Ed. Politehnica, Timisoara, 2010.
2. <https://intranet.etc.upt.ro>

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

- This discipline offer basic knowledge for Electronic Circuits Project, Analogue Integrated Circuits, Power Electronics. etc.)
- Representative employers (Continental, Hella, Elster, Yazaki, Alcatel, Flextronics, etc.) require electronic circuits knowledge

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Theoretical aspects description	Written examination	1/3
	Applications solving	Written examination	1/3
10.5 Applied activities	S:		
	L: Measurements, calculations, simulations, homeworks, attendance	Written test, Oral test, attendance evidence	1/3
	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"> • Minimum 5 (50% explained correctly) for theoretical aspects • Minimum 5 (50% solved correctly) for applications • Minimum 5 for application activity (design, test of a medium complexity electronic circuit, attendance 			

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

Date of completion

5/03.2015

Course coordinator

(signature)

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Coordinator of applied activities

(signature)

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Head of Department

(signature)

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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.