COURSE GUIDE
2018-2019 Academic Year

Dean,
Prof. Daniela Tărniceriu, PhD

1. Program info

1.1 Higher education institution	"Gheorghe Asachi" Technical University of Iaşi
1.2 Faculty / Department	Electronics, Telecommunications and Information Technology
1.3 Department	Fundamentals of Electronics
1.4 Field	Electronics and Telecommunications Engineering
1.5 Study level	Bachelor
1.6 Study program / Qualification	

2. Course info

2.1 Course name:		**Signals, circuits and systems 2**					
2.2 Course organizer (lecturer)		Prof. Iulian Ciocoiu, PhD (lecturer)					
2.3 Teaching assistants		Lecturer Radu Matei, PhD					
2.4 Year of study	2	2.5 Semester	4	2.6 Assessement	Continuous Exam	2.7 Category	DI

3. Estimated total time (hours per semester for teaching activities)

3.1 Number of hours per week	6	3.2 lecture	3	3.3a sem.	-	3.3b lab	3	3.3c project	-
3.4 Total number of hours in curricula[1]	84	3.5 curs	42	3.6a sem.	0	3.6b lab	42	3.6c project	0

Time distribution [2]	hours
Textbook, course support, references and course notes study	14
Library, electronic platforms and on site documentation	12
Seminar/laboratory preparation, homework, reports, portfolios and essays	26
Tutoring	14
Assessment	32
Other activities	

3.7 Total individual study hours	84
3.9 Total hours per semester	168
3. 10 Number of credit points	7

4. Prerequisites (where applicable)

4.1 curricula type	1. -
4.2 competence type	2. Signals, Circuits & Systems 1

5. Infrastructure (where applicable)

5.1. for lectures	Computer, projector
5.2. for laboratories	Computer network

6. Specific competences [3]

		Number of credits[4]:	7	Credit number according to competences[5]
Professional competences	CP1	Understanding and practical application of analog modulation principles.		2
	CP2	Understanding and practical application of general stability conditions of linear systems, including feedback systems.		2
	CP3	State-space description of linear analog systems.		0.5
	CP4	Understanding and practical application of design methods for linear analog filters.		0.5
	CP5			
	CP6			
	CPS1			
	CPS2			
Transversal competences	CT1	Making connections between theory and applications.		1
	CT2	Identify advantages and limitations of various signal processing principles.		1
	CT3			
	CTS			

7. Course targets (as resulting from **6. Specific competences** table)

7.1 Course main target	Introduction of basic principles of analog modulation methods and linear circuit stability.
7.2 Course specific targets	Amplitude, frequency and phase modulation techniques; stability criteria for linear systems; stability criteria for linear feedback systems; state-space description of analog linear systems; introduction to analog filter design methods.

8. Contents

8.1 Lectures[6]	**Teaching methods** [7]	**Notes**
1. Introduction to modulation principles and methods 2. Amplitude modulation using harmonic carriers 3. Amplitude modulation using impulse-type carriers 4. Amplitude demodulation techniques 5. Frequency modulation and demodulation 6. Phase modulation and demodulation 7. Linear systems stability 8. Feedback systems stability: Nyquist criteria, root-locus 9. State-space representation of analog linear systems 10. Analog filter design methods	Lectures, PPT presentations, problem solving, discussions.	Course notes available on the Moodle platform.
References: 1. L. Goraş, **Semnale, circuite şi sisteme**, Editura "Gh. Asachi" Iaşi 1993 2. Gh. Cartianu, s.a., **Semnale circuite şi sisteme**, Editura Didactica şi Pedagogica, Bucureşti 1982 3. Ad. Mateescu, s.a., **Semnale circuite şi sisteme**, Editura Didactică şi Pedagogică, Bucureşti 1980		
8.2a Seminar	**Teaching methods** [8]	**Notes**
8.2b Lab	**Teaching methods** [9]	**Notes**
Amplitude modulation using nonlinearity of electronic devices Amplitude modulation using multiplication Amplitude modulation using impulse-type carriers Amplitude demodulation techniques Frequency modulation and demodulation Response of bandpass filters to modulated signals Harmonic oscillators using operational amplifiers	Experimental mesurements, computer simultaions, circuit design.	
8.2c Project	**Teaching methods** [10]	**Notes**
References: 1. Ciocoiu, I.B., Leuciuc, A., **Semnale, circuite şi sisteme - Îndrumar de laborator**, Editura Stef, Iaşi, 2007, ISBN 978-973-8961-88-3 2. Mugur Săvescu, s.a., **Semnale, circuite şi sisteme - Probleme**, Editura Didactică şi Pedagogică, Bucureşti 1981 3. Ad. Mateescu, s.a., **Probleme de analiză şi sinteza circuitelor electrice**, Editura Tehnică, Bucureşti 1978		

9. Course contents corroboration with the expectations of the epistemic community representatives, professional associations and relevant employers in the field of the program [11]

The course offers a solid theoretical support for the upcoming speciality courses, along with practical and programming skills required by relevant employers in the field.

10. Assessment

Activity type	**10.1 Assessment criteria**	**10.2 Assessment methods**	**10.3 Percentage of final grade**
10.4 Lectures	Knowledge of theoretical aspects, problem solving	Weekly tests [12]:	10% (minim 5)
		Homeworks:	%
		Final evaluation: written exam	80% (minim 5)
10.5a Seminar			%
10.5b Lab	Proper use of lab equipment, practical circuit implementation and measurement	Lab evaluation	10% (minim 5)
10.5c Project			% (minim 5)
10.5d Other activities [13]			% (minim 5)

10.6 Minimum performance standard [14]
Full presence at lab activities Mathematical expressions and typical waveforms of AM/FM signals Definition of linear systems stability

Completion date,   Course organizer signature,   Teaching assistant signature,

10/09/2018   Prof. Iulian CIOCOIU, PhD   Lecturer Radu MATEI, PhD

Department approval date,   Head of department signature,

11/09/2018   Lecturer Ţigăeru Liviu, PhD

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[1] *Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.5, 3.6abc)*

[2] *Liniile de mai jos se referă la studiul individual; totalul se completeaza la punctul 3.7.*

[3] *Competenţele din Grilele G1 şi G1bis ale programului de studii, adaptate la specificul disciplinei, pentru care se repartizează credite (www.rncis.ro sau site-ul facultăţii)*

[4] *Din planul de învăţământ*

[5] *Creditele alocate disciplinei se distribuie pe competenţe profesionale şi transversale în funcţie de specificul disciplinei*

[6] *Titluri de capitole şi paragrafe*

[7] *Expunere, prelegere, prezentare la tablă a problematicii studiate, utilizare videoproiector, discuţii cu studenţii (pentru fiecare capitol, dacă este cazul)*

[8] *Discuţii, dezbateri, prezentare şi/sau analiză de lucrări, rezolvare de exerciţii şi probleme*

[9] *Demonstraţie practică, exerciţiu, experiment*

[10] *Studiu de caz, demonstraţie, exerciţiu, analiza erorilor etc.*

[11] *Legătura cu alte discipline, utilitatea disciplinei pe piaţa muncii*

[12] *Se va preciza numărul de teste şi săptămânile în care vor fi susţinute.*

[13] *Cercuri ştiinţifice, concursuri profesionale etc.*

[14] *Se particularizează la specificul disciplinei standardul minim de performanţă din grila de competenţe a programului de studii, dacă este cazul.*