

SYLLABUS₁

1. Information about the program

1.1 Higher education institution	Universitatea Politehnica Timisoara
1.2 Faculty ₂ / Department ₃	Electronics and Telecommunications/Communications
1.3 Chair	—
1.4 Field of study (name/code ₄)	
1.5 Study cycle	L
1.6 Study program (name/code)/Qualification	

2. Information about the discipline

2.1 Name of discipline	Signals and Systems						
2.2 Coordinator (holder) of course activities	Corina Naforita						
2.3 Coordinator (holder) of applied activities ₅	Corina Naforita						
2.4 Year of study ₆	II	2.5 Semester	1	2.6 Type of evaluation	E	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	1/1/0/0
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					11
Additional documentation in the library, on specialized electronic platforms and on the field					7.5
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays					11
Tutoring					3
Examinations					2.5
Other activities					
Total hrs. of individual activities					35
3.8 Total hrs. / semester ₇	91				
3.9 No. of credits	4				

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"> Mathematics I-IV, Electrical Circuits, Introduction to Computer Programming, Physics, Electronic devices,
4.2 Competencies	<ul style="list-style-type: none"> Electronic systems analysis , Electronic systems synthesis, Analog and digital filter design

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> Presentations from PowerPoint slides published on the Communications dept. page, http://shannon.etc.upt.ro/teaching/
5.2 to conduct practical activities	<ul style="list-style-type: none"> There are proposed homework subjects, at each lab, and the students are examined. At the seminar, they have tests.

6. Specific competencies acquired

Professional competencies	<ul style="list-style-type: none"> C1 Utilizarea elementelor fundamentale referitoare la dispozitivele, circuitele, sistemele, instrumentatia si tehnologia electronica; C2 Aplicarea metodelor de baza pentru achizitia si prelucrarea semnalelor; C5 Selectarea, instalarea, configurarea si exploatarea echipamentelor de telecomunicatii fixe sau mobile si echiparea unui amplasament cu retele uzuale de telecomunicatii
Transversal competencies	<ul style="list-style-type: none"> CT1 Analiza metodică a problemelor întâlnite în activitate, identificând elementele pentru care exista solutii consacrate, asigurând astfel îndeplinirea sarcinilor profesionale; CT3 Adaptarea la noile tehnologii, dezvoltarea profesionala si personala, prin formare continua folosind surse de documentare tiparite, software specializat si resurse electronice în limba româna si, cel puțin, într-o limba de circulatie internationala

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"> This course is frequently found in electrical engineering curricula, the concepts and techniques that form the core of the subject are of fundamental importance in all engineering disciplines. Our approach has been guided by the continuing developments in technologies for signal and system design and implementation, which made it increasingly important for a student to have equal familiarity with techniques suitable for analyzing and synthesizing both continuous-time and discrete-time systems.
7.2 Specific objectives	<ul style="list-style-type: none"> Specific objectives are to teach students to describe signals mathematically, to perform operations on signals, to classify them as continuous-time or discrete-time, as periodic or non-periodic, and as having even or odd symmetry. The students must be able to describe linear time invariant systems using linear constant coefficient differential equation, the impulse response and to implement the system in direct form I and II. They will understand various system properties (linearity, time invariance, presence or absence of memory, causality,

§ 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.

Bibliography⁹

1. Corina Naforita, "Signals and Systems, vol. 1", Politehnica Publishing House, 2009, ISBN 978-973-625-942-5 (ISBN 978-973-625-944-9 vol I), published in English.
2. Corina Naforita, Alexandru Isar, Signals and systems. Vol. 2., 2016, Politehnica Publishing House, ISBN 978-973-625-942-5 (ISBN 978-606-35-0072-5 vol II), published in English.
3. Alan V. Oppenheim, Alan S. Willsky with S. Hamid Nawab, Signals & Systems, Second Edition, Prentice Hall, Upper Saddle River, New Jersey, 1997, ISBN 0-13-814757-4.
4. Simon Haykin, Barry Van Veen, Signals and Systems, 2nd edition, John Wiley & Sons, 2003
5. Michael J. Roberts, Signals and systems : Analysis using transform methods and MATLAB, McGraw Hill, 2004
6. Hwei Hsu, Schaum's Outline of Signals and Systems, 3rd Edition (Schaum's Outline Series), 2013.
7. Monson Hayes, Digital Signal processing, 2nd edition, McGraw Hill, Schaum's outlines, 2011.

8.2 Applied activities ¹⁰	No. of hours	Teaching methods
Study of periodic signals Second order systems Transversal digital filters Discrete Fourier transform	14	Presentation, Measurements, Simulations, Discussion
Complex numbers. Continuous- and discrete-time signals Convolution of signals in continuous and discrete time Continuous and discrete-time Fourier series Fourier transform	14	Presentation, Discussion, Seminar

Bibliography¹¹ Laboratory and seminar online at <http://shannon.etc.upt.ro/teaching/ss-pi>

Hwei Hsu, Schaum's Outline of Signals and Systems, 3rd Edition (Schaum's Outline Series), 2013

Monson Hayes, Digital Signal processing, 2nd edition, McGraw Hill, Schaum's outlines, 2011

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

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.

- The Signals and systems course is fundamental in the study of electronics and telecommunications. Similar courses taught at universities abroad are:
- Signals and Systems, MIT, <http://ocw.mit.edu/resources/res-6-007-signals-and-systems-spring-2011/>
- Deepa Kundur, Signals and Systems, University of Toronto, <http://www.comm.utoronto.ca/~dkundur/course/signals-and-systems/>
- Deepa Kundur, ECE 362 Digital Signal Processing, University of Toronto, <http://www.comm.utoronto.ca/~dkundur/course/ece-362-digital-signal-processing/>
- Signals and Systems, UC Berkeley, <http://ptolemy.eecs.berkeley.edu/eecs20/>

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Minimum mark 5	Written exam	2/3
10.5 Applied activities	S: Minimum mark 5	Test, homework	1/6
	L: Minimum mark 5	Report on each laboratory	1/6
	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 mark 5 is obtained for activity mark minimum 5 and exam mark minimum 5 with mark = $1/3 * \text{activity} + 2/3 * \text{exam}$ 			

Date of completion

19.12.2016

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.