SYLLABUS

Discipline name	Signals Theory
Profile	Electronics and Telecommunications Engineering
Specialization	Telecommunications Technologies and Systems
Code	51321909
Course leader	Prof. Marina Ţopa, Ph.D – Marina.Topa@bel.utcluj.ro, Assoc. Prof. Victor Popescu – Victor.Popescu@bel.utcluj.ro
Collaborators	Assistant Ioana Popescu – Ioana.Popescu@bel.utcluj.ro Assistant Erwin Szopos – Erwin.Szopos@bel.utcluj.ro Assistant Botond Sandor Kirei – Botond.Kirei@bel.utcluj.ro
Department	Basis of Electronics
Faculty	Electronics, Telecommunications and Information Technology

Sem.	Type of discipline	Course	Applications			Course	Applications			Ind. study	TOTAL	Credits	Form of assessment
		[hours/week]				[hours/sem.]							
			S	L	P		S	L	P				
3	**Engineering**	**2**	**1**	**1**	**-**	**28**	**14**	**14**	**-**	**94**	**150**	**5**	**Exam**

Acquired competences :
Acquired skills (what the student is able to do):
After completing the discipline, the students will be able to: - Classify signals and systems; - Analyze in time and frequency domains the analog periodic signals and impulses; - Plot the spectrum of analog signals and find their frequency bands, the energy; - Work with cross-correlation and convolution; - Describe and analyze analog systems; - Understand the consequences of the sampling theorem; - Work with modulated signals with sinusoidal carrier.
Acquired abilities: (what type of equipment/instruments/software the student is able to handle)
After completing the discipline, the students will be able to: - Use the OrCAD software for signals and systems analysis; - Use OrCAD for modeling some systems; - Use a spectral analyzer, an oscilloscope and a signal generator for frequency analysis.

Prerequisites (if necessary)
Knowledge about complex numbers, trigonometric functions, Fourier series, Fourier and Laplace transforms, electric signals.

A. Course/Lecture (course/lecture titles)	
1	Introduction to signals theory.
2	Classification of signals.
3	Introduction to systems theory.
4	Periodic signals.
5	Impulses.
6	Applications 1 – analog signals.
7	Description of analog signals.
8	Analysis of analog signals.
9	Applications 2 – analog systems.
10	Sampled signals.
11	Amplitude modulation.
12	Special procedures of amplitude modulation.
13	Position and frequency modulation.
14	Application 3 – modulated signals.

B1. Applications – Laboratory (list of laboratories)	
1	Introduction in OrCAD.
2	Periodic signals.
3	Properties of Fourier harmonic series.
4	Frequency characteristics.

5	Sampled signals.
6	Amplitude modulation (AM and DSB).
7	Review.

B2. Applications –Seminar (contents)	
1	General properties of signals.
2	Periodic signals.
3	Impulses.
4	Description of circuits.
5	Bode plots.
6	Sampled signals.
7	Modulated signals.

C. Individual study (reference study contents, synthesis materials, projects, applications etc.)

7 sets of problems

Individual study structure	Course study	Problem solving, laboratory, project	Applications preparation	Examination time	Additional reference study	Total no. of individual study hours
Hours	28	20	21	3	22	94

References (Textbooks, courses, laboratory manual, exercise book)

1. Victor POPESCU – *Semnale, Circuite şi Sisteme, partea I,* Editura Casa Cărţii de Ştiinţă, 2001
2. Marina Dana ŢOPA – *Semnale, Circuite şi Sisteme, partea a II-a,* Editura Casa Cărţii de Ştiinţă, 2002
3. Victor POPESCU – *Semnale, circuite şi sisteme – III, Teoria circuitelor*. Casa Cărţii de Ştiinţă, 2003
4. Adelaida MATEESCU ş.a. – *Semnale şi Sisteme,* Editura Teora, 2001
5. Ioana POPESCU, Erwin SZOPOS, Victor POPESCU, Marina Dana ŢOPA – *Semnale, circuite şi sisteme. Îndrumător de laborator IV,* Editura Casa Cărţii de Ştiinţă, 2003.

On – line references

http://193.226.5.66/scs/rom/ts_main.html

Final evaluation	
Evaluation method	Tests at the courses, seminars, laboratories and a final written exam. The exam consists of questions on theory, multiple-choice questions and problems.
Mark components	A total number of 100 points (for the maximum mark 10) are distributed as follows: - 10p for the activity at the courses AC; - 15p for tests at the courses C; - 15p for seminar tests S; - 10p for the laboratory tests L; - 50p for the written exam E: 10p theory, 20p multiple-choice questions and 20p problems .
Mark computation	M = (C+S+L+E)/10 if E>20

Course leader,

Prof. Marina ŢOPA, Ph.D.