



DISCIPLINE ACADEMIC SHEET
ACADEMIC YEAR 2025 – 2026

1. PROGRAMME DATA

1.1. Higher Education Institution	UNIVERSITY OF CRAIOVA
1.2. Faculty	Automation, Computers and Electronics
1.3. Department	Computers and Information Technology
1.4. Field of Study	Computers and Information Technology
1.5. Study level	L(License / Undergraduate)
1.6. Organizational form	IF
1.7. Study Program (name/code) /Qualification	Computers / L2060101010

2. DISCIPLINE DATA

2.1 Discipline Name	Signal Processing						
2.2 Course Activities Holder	Pătrașcu Constantin						
2.3. Practical Activities Holder	Pătrașcu Constantin						
2.4. Study Year	4	2.5. Semester	2	2.6. Evaluation type	E	2.7. Discipline regime	DOP

3. ESTIMATED TOTAL TIME (hours per semester of teaching activities)

3.1. Number of hours per week	4	in which: 3.2 course	2	3.3. sem./lab./pr.	2
3.4. Total hours of curriculum	40	in which: 3.5 course	20	3.6. sem./lab./pr.	20
3.7. Time distribution - hours/week					hours
Study after manual, course support, bibliography and notes					15
Additional documentation in library, on specialized electronic platforms and field					20
Training seminars / labs, homework, portfolios and essays					20
Tutorial					-
Examinations					-
Other activities.....					5
Total hours per individual activities					60
3.8. Total hours per semester					100
3.9. Number of credits					4

4. PRECONDITIONS (where appropriate)

4.1. of curriculum	•
4.2. of competence	•

5. CONDITIONS (where appropriate)

5.1. of the course	•
5.2. of seminar/ laboratory/project	•

6. COURSE OBJECTIVES – expected learning outcomes that are supported by completing and passing the course

Knowledge	The student/graduate describes, identifies and summarizes elementary concepts and methods for signal acquisition, analysis and processing, implemented in systems with general-purpose processors or signal processors, and the way they are applied to concrete problems. Uses specific methods and tools for characterizing signals in the time domain and in the frequency domain, performs the acquisition, analysis and digital processing of analog signals. The student/graduate designs, measures, evaluates the performances of, diagnoses and debugs functional blocks of small/medium complexity for signal analysis and digital processing, using dedicated simulation environments (Matlab, Python, etc.). The student/graduate designs functional blocks of small/medium complexity for signal analysis and digital processing and implements them on signal processors, microcontrollers or dedicated processors. Shows a spirit of initiative for updating professional, economic and organizational culture knowledge.
Skills (Abilities)	The student/graduate uses specific methods and tools for characterizing signals in the time domain and in the frequency domain, performs the acquisition, analysis and digital processing of analog signals. The student/graduate designs, measures, evaluates the performances of, diagnoses and debugs functional blocks of small/medium complexity for signal analysis and digital processing, using dedicated simulation environments (Matlab, Python, etc.). The student/graduate designs functional blocks of small/medium complexity for signal analysis and digital processing and implements them on signal processors, microcontrollers or dedicated processors.
Responsibility and autonomy	The student/graduate shows a spirit of initiative and action for updating professional, economic and organizational culture knowledge.

7. CONTENT

7.1. Course	The method of implementation	Teaching methods	Allocated time (hours)
Ch. 1. Digital signal processing; 1.1. Algorithms for DSP; 1.2. Computing architectures for DSP; 1.3. Integrated circuits for DSP; 1.4. Fields of use of DSP; 1.5. Characteristics of digital signal processing	face to face	Video projector	4
Ch. 2. Filtering; 2.1. RC and CR filters; 2.2. Types of filters; filter performance criteria; 2.3. Finite impulse response (FIR) filters; 2.4. Infinite impulse response (IIR) filters; 2.5. Implementation of digital filters; 2.6. Comparison between FIR and IIR filters; 2.7. Noise in filter design	face to face		4
Ch. 3. Transforming signals into the frequency domain; 3.1. The phasor model; 3.2. Modeling sinusoids; 3.3. Fourier series; 3.4. Discrete Fourier series; 3.5. Non-periodic signals - Fourier transforms; 3.6. The discrete Fourier transform; 3.7. The fast Fourier transform	face to face		4
Ch. 4. Waveform coding; 4.1. Analog	face to face		4

waveform coding; 4.2. Digital coding - pulse code modulation; 4.3. Delta modulation; 4.4. Vocoders; 4.5. Windowing; 4.6. Channel vocoders; 4.7. Linear predictive coding			
Ch. 5. Designing systems with DSP; 5.1. Hardware alternatives for DSP; 5.2. Fixed-point DSP; 5.3. Floating-point DSP; 5.4. Considerations on DSP speed; 5.5. Accessing memory resources; 5.6. Integrating peripheral devices	face to face		4
Bibliography:			
1. C. Marven, G. Ewers – A simple approach to digital signal processing, John Willey & Sons, Inc. 1996 2. R. Chassaing, D. Horning – Digital signal processing with the TMS320C25, John Willey & Sons, Inc. 1990 3. I. Ahmed – Digital control applications with the TMS320 family, Texas Instruments, Dallas, 1991 4. *** TMS320C5x DSK Applications Guide, Texas Instruments Europe, 1997			

7.2. Seminar/laboratory/project	The method of implementation	Teaching methods	Allocated time (hours)
1. Presentation of the OMAP 5912 Starter Kit	face to face	Platforms	4
2. Generating sinusoidal signals of variable frequency and amplitude	face to face	Platforms	4
3. Generating musical notes using signal processors	face to face	Platforms	4
4. Digital filters	face to face	Platforms	4
5. Serial communication	face to face	Platforms	4
Bibliography:			
1. C. Marven, G. Ewers – A simple approach to digital signal processing, John Willey & Sons, Inc. 1996 2. R. Chassaing, D. Horning – Digital signal processing with the TMS320C25, John Willey & Sons, Inc. 1990 3. I. Ahmed – Digital control applications with the TMS320 family, Texas Instruments, Dallas, 1991 4. *** TMS320C5x DSK Applications Guide, Texas Instruments Europe, 1997 5. *** Code Composer Studio v4.0 User's Guide			

8. Correlating the content of the discipline with the expectations of representatives from the epistemic community, professional associations and representative employers in the field related to the program

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9. EVALUATION

Activity Type	9.1. Evaluation criteria	9.2. Evaluation methods	9.3. Final mark weight
9.4. Course		Written exam	70%

9.5. Seminar/laboratory/project	L:	Periodic and final assessment	30%
9.6. Minimum standard of performance			

Date of Completion	Signature of the Course Activities Holder,	Signature of the Practical Activities Holder,
23.08.2025	Pătrașcu Constantin	Pătrașcu Constantin

Date of Approval in the Department	Signature of the Department Director,
25.08.2025	Ș.l.dr.ing. Nicolae ENESCU

Date of Approval in the Faculty	Signature of the Dean,
	Prof.dr.ing. Dorin ȘENDRESCU