FACULTY OF ELECTRICAL ENGINEERING

SUBJECT CARD

Name in Polish:	**Cyfrowe przetwarzanie sygnałów 2**
Name in English:	**Digital signal processing 2**
Main field of study (if applicable):	**Control Engineering and Robotics**
Specialization (if applicable):	
Level and form of studies:	**1st level, full-time**
Kind of subject:	**obligatory**
Subject code:	**ARR041311**
Group of courses:	**NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):				30	
Number of hours of total student workload (CNPS):				60	
Form of crediting:				crediting with grade	
For group of courses mark (X) final course:					
Number of ECTS points:				2	
including number of ECTS points for practical (P) classes :				2	
including number of ECTS points for direct teacher-student contact (BK) classes:				1.40	

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Mathematical knowledge of Laplace and Fourier transforms.
2. The basic ability to programming in C

SUBJECT OBJECTIVES

C1. Project and implementation of simple digital systems.
C2. Signal processors programming.
C3. Effective working in groups, focused on creativity and collaboration.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

relating to skills:

PEK_U01 Able to be used mathematical tools in programming environments for the description and analysis of digital signal processing problems.

PEK_U02 Able to design and implement the correct algorithms for digital signal processor.

relating to social competences:

PEK_K01 Has a aware of the responsibility for their own work in a group, realizes the rules teamwork.

PROGRAMME CONTENT

Form of classes - project		Number of hours:
Proj 1	Students on the following classes, perform preparatory projects in the introductory digital signal processing topics. The purpose of these projects is an introduction to programming in a digital signal processor environment, and practical implementation issues presented during the lecture. These include: sampling methods, signal processing in real-time, generation of discrete signals, spectral analysis using the fast Fourier transform and digital filtering.	14
Proj 2	Students using the skills developed during the preparatory projects, implement a complex application for digital signal processor. Work is to design the application, its implementation, and verification of digital signal processor operation in real conditions.	14
Proj 3	Summary and evaluation of project work.	2
	Total hours:	**30**

TEACHING TOOLS USED
N1. Project works using computer equipment. N2. Project work in laboratory on stands with signal processors and measuring equipment.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation *F – forming (during semester)* *P – concluding (at semester end)*	**Educational effect number**	**Way of evaluating educational effect achievement**
F1(P)	PEK_U01	Evaluation for preparatory projects.
F2(P)	PEK_U02 PEK_K01	Evaluation for final project.
P(P)	1/3*F1+2/3*F2	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] T. P. Zieliński „Cyfrowe przetwarzanie sygnałów”, 2005
[2] A. V. Oppenheim, R. W. Schafer „Cyfrowe przetwarzanie sygnałów“ 1989
[3] R. G. Lyons „Wprowadzenie do cyfrowego przetwarzania sygnałów” 1999

SECONDARY LITERATURE:

[1] G. Marven, G. Ewers „Zarys cyfrowego przetwarzania sygnałów” 1999
[2] W. Brodziewicz, K. Jaszczak „Cyfrowe przetwarzanie sygnałów” 1987
[3] R. Gabel, R. Roberts „Sygnały i systemy liniowe” 1978
[4] K. Steiglitz „Wstęp do systemów dyskretnych” 1977

SUBJECT SUPERVISOR

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
ARR041311 - Digital signal processing 2
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Control Engineering and Robotics**

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)	Subject objectives	Programme content	Teaching tool number
PEK_U01	K1AiR_U28	C.1 C.2	Proj1	N.1
PEK_U02	K1AiR_U28	C.1 C.2	Proj2	N.1 N.2
PEK_K01	K1AiR_K03 K1AiR_K05	C.3	Proj2 Proj3	N.2