GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Digital Technology, PG_00047809		
Field of study	Informatics		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Automatic Control -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Kamil Stawiarski	
	Teachers	dr inż. Kamil Stawiarski dr inż. Stefan Sieklicki	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

E-learning hours included: 0.0

Adresy na platformie eNauczanie:

Technika cyfrowa, informatyka, studia niestacjonarne, semestr 3, 2021/2022 - Moodle ID: 20339
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=20339

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	30	11.0	59.0	100

Subject objectives

1. Aims of the course (effects of the course): Skills of digital and microprocessor system description, analysis and designing . 2. Description of CCs: logic functions and truth tables, description of SCs: state transition tables and diagrams for Moore and Mealy models. Examples of CCs and SCs circuits.Positional number systems: decimal, binary, octal, hexadecimal. 3. SOP, POS and canonical forms of logic functions 4. Simplification of logic functions using Karnaugh tables and, Quine-McCluskey methode . 5. CC design with logic gates AND, OR, NOT,NAND and NOR.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W02] Knows and understands, to an advanced extent, selected laws of physics and physical phenomena as well as methods and theories explaining the complex relationships between them, constituting the basic general knowledge in the field of technical sciences related to the field of study	extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	[SW1] Assessment of factual knowledge
	[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	[SU1] Assessment of task fulfilment
	[K6_W06] Knows and understands the basic processes occurring in the life cycle of devices, facilities and systems specific to a given field of study.	Knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U41] can produce, test or evaluate software using modern programming platforms, tools, languages and paradigms of different levels, as well as use software packages supporting scientific and research processes as well as business decision-making processes and teamwork	is able to produce or evaluate software using modern tools, languages and programming paradigms at various levels, as well as use software packages supporting scientific-research and business decision-making processes as well as teamwork	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information
	[K6_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	understands at an advanced level the principles, methods and techniques of programming as well as the principles of creating computer software or programming devices or controllers using microprocessors or programmable components or systems,	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
Subject contents	1. Aims of the course (effects of the course): Skills of digital and microprocessor system description, analysis and designing with use of IC catalogues and application notes. 2. Description of CCs: logic functions and truth tables, description of SCs: state transition tables and diagrams for Moore and Mealy models. Examples of CCs and SCs circuits.Positional number systems: decimal, binary, octal, hexadecimal. 3. Signed number representation BIN, HEX, BCD, U1, U2, and binary arithmetic, floating-point notation. 4. SOP, POS and canonical forms of logic functions forms, other Algebras examples, exemplary uses of Boo-lean Algebra connecting networks 5. Simplification of logic functions using Karnaugh tables and, Quine-McCluskey methode . 6. CC design with logic gates AND, OR, NOT,NAND and NOR. Some remarks on simplification of SOP and POS forms contrary global simplification, transition times.		
Prerequisites and co-requisites	No requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	activity / presence	50.0%	20.0%
	Midterm colloquium	50.0%	80.0%
Recommended reading	Basic literature	M. Barski, W. Jędruch , Układy Cyfrowe W. Majewski, Układy logiczne Zieliński C.: Podstawy projektowania układów cyfrowych, Wydawnictwo Naukowe PWN, Warszawa 2003	
	Supplementary literature	F. Tinder, Engineering Digital Design J. D. Daniels, Digital Design from Zero to One Texas Instruments, Digital Design Seminar	

	eResources addresses	Technika cyfrowa, informatyka, studia niestacjonarne, semestr 3, 2021/2022 - Moodle ID: 20339 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=20339
Example issues/ example questions/ tasks being completed	- Carry out the operation (10101)2 x (101) 2) the result reported in the decimal system, - The function f(d,c,b,a)= Π (0, 3, 5, 8, 12, 14, (2,11,13)) achieved using a a multiplexer 4/1 and NAND Gates. -Provide a table of trigger JK and D , - Design the table in a logical network to build the NAND Gate - Design the synchronous presence or within binary digits given in the series in the number of ones is an even number other than zero, which should be indicated by setting the output in=1 for exactly one clock cycle.	
Work placement	Not applicable	