GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Digital Technology - laboratory, PG_00047557		
Field of study	Automatic Control, Cybernetics and Robotics		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	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. Marcin Pazio	
	Teachers	dr inż. Marcin Pazio dr inż. Jarosław Magiera dr inż. Kamil Stawiarski mgr inż. Marlena Gruba mgr inż. Jan Glinko	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	0.0	0.0	30

E-learning hours included: 0.0

Adresy na platformie eNauczanie:
Technika Cyfrowa - laboratorium 21/22L - Moodle ID: 22161
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22161

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	4.0	66.0	100

Subject objectives

The class of logic students acquire knowledge of:

- The mathematical systems used to describe iterative combination and sequence combination

- Introduction to binary, binary, Boolean algebra arytmetyka's logical functions

- Basic concepts, systems, systems iterative

- Synthesis of sequential iterative and sequence

- Synthesis of synchronous and asynchronous sequential Circuits

- memory

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	Student after lab classes. The TC can design, according to the specified specification, and perform typical digital systems a simple device, object, system or process, using appropriately selected methods, techniques, tools and materials, using standards and Engineering standards, using technology-specific technologies and using the experience gained in an environment of professional engineering activities	[SU4] Assessment of ability to use methods and tools
[K6_U06] can analyse the operation of components, circuits and systems related to the field of study, measure their parameters and examine technical specifications	Student after lab classes. The TC can design, according to the specified specification, and perform typical digital systems a simple device, object, system or process, using appropriately selected methods, techniques, tools and materials, using standards and Engineering standards, using technology-specific technologies and using the experience gained in an environment of professional engineering activities	[SU1] Assessment of task fulfilment

Subject contents

. TTL and CMOS gates testing 2. Designing, assembling and testing iterative circuits 3. Designing and assembling digital timing circuits 4. Designing synchronous sequential circuits 5. Assembling and testing synchronous sequential circuits 6. Designing counter modules 7. Assembling and testing counter modules 8. Designing, assembling and testing register modules 9. Designing asynchronous sequential circuits 10. Assembling and testing asynchronous sequential circuits 11. Microprogramming: coding data interchange between digital modules 12. Microprogramming: implementing the code from ex.11 13. Prototyping digital circuits: designing various projects 14. Assembling projects from ex.13 15. Prototyping: testing projects from ex.14

Prerequisites and co-requisites

No requirements

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
activity / presence	50.0%	50.0%
Realization of task	50.0%	50.0%

Recommended reading

Basic literature	R. F. Tinder, Engineering Digital Design J. D. Daniels, Digital Design from Zero to One Texas Instruments, Digital Design Seminar M. Barski, W. Jędruch, Digital Circuits W. Majewski, Logical Circuits Zieliński C .: Fundamentals of Digital Circuit Design, Wydawnictwo Naukowe PWN, Warsaw 2003
Supplementary literature	Logical circuits Zieliński C .: Fundamentals of digital circuits design, Wydawnictwo Naukowe PWN, Warsaw 2003 logic circuits Stefan Sieklicki - script from the subject of Logical Circuits
eResources addresses	Technika Cyfrowa - laboratorium 21/22L - Moodle ID: 22161 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22161

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. Enter in the solution: 1. Graf and a table to access/exit created based on graph tables and minimum 2. function triggers excitations for pursuing more bits of triggers JK 3. minimum output 4. function schematic diagram
Work placement	Not applicable