

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Digital Systems Design		Code 1010804131010810032
Field of study Electronics and Telecommunications	Profile of study (general academic, practical) general academic	Year /Semester 2 / 3
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 30 Classes: 15 Laboratory: - Project/seminars: -		No. of credits 4
Status of the course in the study program (Basic, major, other) major		(university-wide, from another field) from field
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 4 100% 4 100%
Responsible for subject / lecturer: dr inż. Piotr Remlein email: remlein@et.put.poznan.pl tel. 665-3934 Wydział Elektroniki i Telekomunikacji ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K1_W05 Has a detailed, systematic knowledge of the fundamentals of circuit theory, together with necessary mathematical background; this knowledge allows him/her to understand, analyze and evaluate the operation of electrical circuits.
2	Skills	K1_U09 Demonstrates the ability to solve problems related to signal analysis in time domain and frequency
3	Social competencies	K1_K01 Is aware of the limitations of his/her current knowledge and skills; is committed to further self-study.
Assumptions and objectives of the course: The main aim of the lecture is knowledge of basic design digital circuits and systems.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Knows the theoretical foundations and principles of design of digital circuits, and of construction of digital electronic elements; knows the theoretical foundations of analysis and design of digital circuits and CAD. - [K1_W12]		
2. Has knowledge of construction, architecture and practical application of digital circuits. - [K1_W12]		
Skills:		
1. Is able to analyze, design and build digital circuits, using appropriate methods and engineering tools, and taking into consideration predefined criteria. Is able to use models, catalogue cards and application notes of semiconductor electronic elements. Is able to analyze and design circuits and systems using CAD. - [K1_U16]		
2. Is able to use catalogues, find required information from application notes of semiconductor elements and digital circuits, select appropriate elements and electronic circuits. - [K1_U12]		
3. Is able to analyze and design logic circuits. - [K1_U24]		
4. Is able to extract information from Polish or English language literature, databases and other sources. Is able to synthesize gathered information, draw conclusions, and justify opinions. - [K1_U01]		
Social competencies:		

1. Is aware of the limitations of his/her current knowledge and skills; is committed to further self-study. - [K1_K01]
 2. Demonstrates responsibility and professionalism in solving technical problems. Is able to participate in collaborative projects. - [K1_K02]

Assessment methods of study outcomes		
Tests and written exam		
Course description		
Lectures- Number systems, binary arithmetic, Boolean algebra, logical functions, design of combinational circuits, minimization method?s, arithmetic circuits, programmable logic devices, sequential circuits, flip-flops, registers and counters, sequential circuits analysis and design, automated synthesis of finite-state machines based on Mealy and Moore models, asynchronous circuits		
Basic bibliography:		
1. 1. Układy cyfrowe. Zbiór zadań z rozwiązaniami, Jerzy Tyszer, Grzegorz Mrugalski, Wydawnictwo Politechniki Poznańskiej, Poznań, 2004		
2. 2. Logic and computer design fundamentals, M.M. Mano, C.R. Kime, Prentice Hall, Upper Saddle River, 1997		
3. 3. Podstawy elektroniki cyfrowej, J. Kalisz, WKiŁ, Warszawa, 1998		
Additional bibliography:		
1. Arytmetyka komputerów, J. Biernat, PWN, Warszawa, 1996.		
2. Logic and computer design fundamentals, M.M. Mano, C.R. Kime, Prentice Hall, Upper Saddle River, 1997.		
3. Digital logic design, J.P. Hayes, Addison-Wesley, Reading, 1994		
4. Practical digital logic design and testing, P.K. Lala., Prentice Hall, Upper Saddle River, 1996		
5. Synteza układów cyfrowych, T. Łuba, WKiŁ, Warszawa, 2003.		
Result of average student's workload		
Activity	Time (working hours)	
1. Lecture	30	
2. Participation in project classes	15	
3. Preparation for the classes and individual study, literature study	30	
4. Consultations with the lecturer	3	
5. Preparation for the Exam	20	
6. Exam	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	100	4
Contact hours	50	2
Practical activities	48	2