

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Digital Systems Design</b>		Code <b>1010804141010810032</b>
Field of study <b>Electronics and Telecommunications</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>2 / 4</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: - Classes: - Laboratory: <b>15</b> Project/seminars: -		No. of credits <b>4</b>
Status of the course in the study program (Basic, major, other) <b>major</b>		(university-wide, from another field) <b>from field</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>4 100%</b> <b>4 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Piotr Remlein email: remlein@et.put.poznan.pl tel. 665-3934 Wydział Elektroniki i Telekomunikacji ul. Piotrowo 3A 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	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	<b>Skills</b>	K1_U09 Demonstrates the ability to solve problems related to signal analysis in time domain and frequency
3	<b>Social competencies</b>	K1_K01 Is aware of the limitations of his/her current knowledge and skills; is committed to further self-study.
<b>Assumptions and objectives of the course:</b> The main aim of the lecture is knowledge of basic design digital circuits and systems.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
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 ]		
<b>Skills:</b>		
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]		
<b>Social competencies:</b>		

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]

<b>Assessment methods of study outcomes</b>		
Lab reports and written exam		
<b>Course description</b>		
Laboratory- Number systems, binary arithmetic, 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		
<b>Basic bibliography:</b>		
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		
<b>Additional bibliography:</b>		
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.		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Laboratory	15	
2. Preparation for the project	48	
3. Individual study, literature study	18	
4. Consultations with the lecturer	3	
5. Preparation for the Exam	14	
6. Exam	2	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	100	4
Contact hours	20	1
Practical activities	84	3