STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Microprocessors systems		**1010331141010332704**
Field of study **Control Engineering and Robotics**	Profile of study (general academic, practical) **(brak)**	Year /Semester **2 / 4**
Elective path/specialty **-**	Subject offered in: **polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **2** Classes: **-** Laboratory: **2** Project/seminars: **-**		No. of credits **5**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences**		ECTS distribution (number and %) **5 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	K_W00: K_W01:
2	**Skills**	K_U01: K_U06:
3	**Social competencies**	K_K00: K_K04:

Assumptions and objectives of the course:

Knowledge of mathematical models, methods of synthesis and CAD tools of digital circuits.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. [K_W03] - [-]

Skills:

1. [K_U03] - [-]
2. [K-U08] - [-]

Social competencies:

1. [K_K04] - [-]
2. [K_K07] - [-]

Assessment methods of study outcomes

Credit for lectures and laboratory exercises.

Course description

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Combinatorial and sequential digital circuits. Boolean functions and finite automata as mathematical models of the circuits. Realization of Boolean functions with use of logic gates, multiplexors, demultiplexors, ROMs and logic arrays. Realization of automata with use of flip-flops. Integrated digital circuits. Microprogrammed circuits and flow diagrams. Concurrent circuits and Petri nets. CAD tools.

Laboratory program:

1. Analysis of combinatorial circuits (UK)
2. Synthesis of combinatoral circuits
3. Realization of UK with use of NAND gates
4. Realization of UK with use of multiplexors
5. Realization of UK with use of demultiplexors
6. Realization of UK with use of ROMs
7. Analysis of sequential circuits (US)
8. Realization of US with use of D-NAND structure
9. Realization of US with use of JK-NAND structure
10. Realization of US with use of memory-register structure
11. Realization of asynchronous US
12. Realization of microprogrammed circuits ? control circuit
13. Realization of microprogrammed circuits ? operational circuit
14. Realization of concurrent circuits
15. Conclusion

Basic bibliography:

1. Teoria układów logicznych, K. Chmiel, Wydawnictwo Politechniki Poznańskiej, Poznań, 1994, 1995
2. Układy cyfrowe - wykłady, K. Chmiel, PowerPoint, Poznań, 2004

Additional bibliography:

1. Układy scalone TTL w systemach cyfrowych, J. Pieńkos, J. Turczyński, WNT, Warszawa, 1980
2. Podstawy projektowania układów cyfrowych, C. Zieliński, PWN, Warszawa, 2003

Result of average student's workload

Activity	Time (working hours)
1. Lectures.	30
2. Laboratory exercises.	30
3. Consultations and examination.	15
4. Preparation to laboratory exercises and elaboration of reports.	30
5. Preparation to tests and examination.	20

Student's workload

Source of workload	hours	ECTS
Total workload	125	5
Contact hours	65	2
Practical activities	60	2

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