

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Data storage systems		Code 1010334491010334632
Field of study Information Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 5 / 9
Elective path/specialty Safety of Computer Systems	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: 8 Classes: - Laboratory: - Project/seminars: 8		No. of credits 3
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 %) 3 100%
Responsible for subject / lecturer: dr inż. Tomasz Bilski email: tomasz.bilski@put.poznan.pl tel. 061 66 53 554 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K_W02: Student has basic knowledge of physics, especially in such fields as mechanics, thermodynamics, optics, electricity, magnetism, nuclear physics, solid-state physics, including knowledge essential to understand physical phenomena in electronic circuits. K_W06: Student has organized knowledge with theoretical foundations of computer system architecture and operating systems.
2	Skills	K_U11: Student is able to do critical analysis of computer hardware operations, operating system and computer networks. K_U16: Student is able to prepare requirements, to create object model and to evaluate uncomplicated IT system, including system functions and relations between system elements.
3	Social competencies	K_K02: Student understands and is aware of the importance of nontechnical issues related to computer engineer activity. Student understands the responsibility associated to his engineering decisions.
Assumptions and objectives of the course: The main course objective is to provide knowledge on models, structure and function of data storage devices and systems. Students should obtain practice in data storage system design.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student has organized knowledge with theoretical foundations of computer system architecture and operating systems. - [K_W06] 2. Student has organized knowledge with theoretical foundations of computer networks. - [K_W07] 3. Student is familiarized with state of the art and current trends in computer science. - [K_W19]		
Skills:		
1. Student is able to do critical analysis of computer hardware operations, operating system and computer networks. - [K_U11] 2. Student is able to evaluate tools and methods usefulness for simple engineering tasks related to computer science. Student is able to choose and to implement proper technologies. - [K_U22]		
Social competencies:		
1. Student understands the importance of stringent accomplishment of a given project with proper notation standards, proper language. Student understands the importance of keeping deadlines. - [K_K07]		
Assessment methods of study outcomes		

Lecture: test. Project assesment.		
Course description		
Lecture Peripheral devices modes of access. Storage systems models (DAS, NAS, SAN, HSM). Interfaces and communication buses (ATA, SCSI, FC, Infiniband). Network systems for data storage (iSCSI, FCIP, IFCP). Storage system security.		
Project Network storage system design with communication protocols, network devices, media and storage systems.		
Basic bibliography:		
1. Schmidt F., SCSI i IDE. 2. Jon William Toigo, The Holy Grail of Network Storage Management 3. Nelson S., Pro Data Backup and Recovery, 2011		
Additional bibliography:		
Result of average student's workload		
Activity	Time (working hours)	
1. Lectures	8	
2. Project	8	
3. Preparation for test	15	
4. Theoretical preparation for project classes	5	
5. Practical preparation for project classes	10	
6. Project assessment	20	
7. Consultations	9	
Student's workload		
Source of workload	hours	ECTS
Total workload	75	3
Contact hours	25	1
Practical activities	38	1