STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Data storage systems**	Code **1010334591010334632**

Field of study **Information Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **5 / 9**

Elective path/specialty **Security of Information Technology (IT)**	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: **16** Classes: **-** Laboratory: **-** Project/seminars: **-**	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