STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Visualization of production processes		**1010641271010647125**

Field of study	Profile of study (general academic, practical)	Year /Semester
Mechanical Engineering	**(brak)**	**4 / 7**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Industrial Mechatronics	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**full-time**

No. of hours	No. of credits
Lecture: **1** Classes: **-** Laboratory: **-** Project/seminars: **1**	**3**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**3 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Knowledge of the use of PLC controllers in thought and programming methods acquired during previous classes in the specialty, Basic knowledge of electronics, automation and information technology acquired during the first-cycle studies
2	**Skills**	380/5000 Programming of PLC controllers in a basic level, PC class support; use English to the extent that enables understanding technical texts; obtaining information from literature, the Internet, databases and other sources; can search in catalogs and on the websites of manufacturers of ready-made machine components for use in own projects.
3	**Social competencies**	[K1A_K01] Understands the need and knows the possibilities of continuous training [K1A_K02] Is aware of the importance and understands the non-technical aspects and effects of the mechanical engineer's activity and its impact on the environment and the responsibility for decisions [K1A_K03] Is aware of the importance of behavior in a professional manner, adherence to the principles of professional ethics and respect for diversity of cultures [K1A_K04] Is aware of responsibility for their own work and readiness to comply with the principles of cooperation in a team and taking responsibility for jointly implemented tasks

Assumptions and objectives of the course:

During the course the student acquaints themselves with the techniques of configuration and programming of HMI displays. It will acquire the ability to use them in its own machine while using PLCs.

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

Knowledge:

1. Has elementary knowledge of automation systems, control algorithms, automation and programming of industrial machines - [M1_W16]

Skills:

1. Is able to search in catalogs and on manufacturers' websites ready machine components for use in own projects - [M1_U02]

Social competencies:

1. He is ready to think and act in an entrepreneurial way - [M1_K05]

Assessment methods of study outcomes

EXAM: A pass on the basis of an exam consisting of 10 general-purpose one-choice questions (for the correct answer to each question: 1 point. Grading: below 0 ÷ 4 points? Ndst., 5? Dst, 6 points? Dst +, 7 pts. db, 8 pts. db +, 9 pts? bdb). Project: Credit based on the group project given at the end of the class, which is assessed on the basis of the evaluation card provided by the teacher.

Course description

1. Types of HMI screens and their methods of operation,
2. Selection of HMI screens,
3. Data representation methods,
4. Possibilities of object configuration,
5. Methods of communication in industrial networks,
6. Types of communication protocols,
7. Examples of practical use of acquired knowledge

Basic bibliography:

1. Mikulczyński T., Automatyzacja procesów produkcyjnych, Wyd. Naukowo Techniczne, 2006
2. Kasprzyk J., Programowanie sterowników przemysłowych, Wyd. Naukowo Techniczne, 2006
3. Jakuszewski R. Programowanie Systemów SCADA, Wyd. Pracowni Komputerowej J. Skalmierskiego, 2006

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	15
2. Participation in design classes	15
3. Developing your own project	22
4. Consultations on the project	8
5. Preparation for the exam	5
6. Exam	2
7. Preparation for lectures	5
8. Consultation of the material discussed during the lecture	2

Student's workload

Source of workload	hours	ECTS
Total workload	74	3
Contact hours	42	2
Practical activities	45	2