STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Passing Project**		Code **1010641261010640466**

Field of study **Mechanical Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **3 / 6**

Elective path/specialty **Mechatronics**	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				No. of credits **5**
Lecture: **-**	Classes: **-**	Laboratory: **-**	Project/seminars: **4**	

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** **Technical sciences**	ECTS distribution (number and %**)** **5 100%** **5 100%**

Responsible for subject / lecturer:	Responsible for subject / lecturer:
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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Mechanics and strength of materials. Fundamentals of machine design. Basics of hydraulics and pneumatics. Mechatronics. Fundamentals of computer science engineering.
2	**Skills**	Defining functions and tasks of the machines. Designing mechatronic constructions using CAD software. Control Systems Design and regulation process. The incorporation of automation and robotics.
3	**Social competencies**	Acquiring engineering knowledge in the field of mechatronics, in particular in the field of mechanical engineering.

Assumptions and objectives of the course:

Implementation of individual mechatronic design of a mechanical device having elements of automation and robotics.

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

Knowledge:

1. Basic knowledge of construction machines and mechanisms theory - [K1A_W05]

2. Knowledge of the principles of engineering drawing - [K1A_W06]

3. Has knowledge of the strength of materials, known numerical method FEM stress analysis - [K1A_W11]

4. Has an elementary knowledge of the fundamentals of computer science and its use in typical engineering applications - [K1A_W13]

5. Knowledge of typical power units in machinery - [K1A_W16]

6. Has an elementary knowledge of automation systems, machinery control systems - [K1A_W17]

7. Knowledge of the selected programs of virtual engineering design - [K1A_W24]

Skills:

1. Knows how to take an information from the literature, the Internet, standards and databases - [K1A_U03]

2. Is able to perform tasks of drawing engineering - [K1A_U04]

3. Is able to perform and present multimedia presentations of engineering tasks - [K1A_U05]

4. Can use a mathematical analysis; perform calculations - [K1A_U07, K1A_U08, K1A_U09]

5. Can use computer package for editing drawings, 3D modeling, design and simulation calculations of simple processes - [K1A_U12, K1A_U13]

6. Is able to design mechatronic systems with automation and control systems   - [K1A_U19]

Social competencies:
1. Understands the need and knows the possibilities of lifelong learning. - [K1A_K01]
2. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment and responsibility for own decisions. - [K1A_K02]
3. Is aware of the importance of behavior in a professional manner, compliance with the rules of professional ethics and respect for cultural diversity. - [K1A_K03]
4. Is able to think and act in an entrepreneurial manner. - [K1A_K05]

Assessment methods of study outcomes
Completion of the course is based on the project individually performed by the student.

Course description
Designing the geometric and physical structure of mechanical device. Kinematics and dynamics of motor components, design propulsion systems. Mechatronic control and regulation, control, electric, pneumatic and hydraulic. The use of programmable controllers. Sensors. Robotics. Computer Engineering.

Basic bibliography:

1. Dietrich M.: Podstawy konstrukcji maszyn, WNT Warszawa 1999, 3 tomy

2. Schmid D.: Mechatronika, Europa-Lehrmittel, polish edition REA Warszawa 2002,

Additional bibliography:

1. Honczarenko J.: Elastyczna automatyzacja wytwarzania, obrabiarki i systemy obróbkowe, WNT Warszawa 2000

Result of average student's workload	
Activity	**Time (working hours)**
1. Preparation of the project	80
2. Consultations	20
3. Preparing to pass	20
4. Participation in the pass	2

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	122	5
Contact hours	22	1
Practical activities	122	5