COURSE DESCRIPTION CARD - SYLLABUS

Course name
Passing project [S1MiBM2>PP]

Course

Field of study
Mechanical Engineering

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
60

Number of credit points

6,00

Coordinators

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Lecturers

Prerequisites

Knowledge: Basic knowledge in the field of machine design, strength of materials, technical mechanics, manufacturing techniques, metrology, automation, CAx systems. Skills: Developing a construction record in accordance with the principles of technical drawing, calculating the strength of machine elements, selecting manufacturing technology and shaping the features of machine components, ability to use a computer-aided design tool. Social competences: self-education skills, including in order to "improve" professional competences, can work individually and in a team.

Course objective

The aim of the course is to carry out an individual project, which is to be a summary (culmination) of the knowledge and skills acquired so far.

Course-related learning outcomes

Knowledge:
He has detailed knowledge of construction and engineering graphics, computer aided machine design (CAD - Computer Aided Design).
Has structured, theoretically based knowledge of the strength of materials.

Has detailed knowledge of manufacturing techniques.
Has advanced knowledge of IT systems used in mechanics and machine construction.
Has advanced knowledge of machine design and creation of technical documentation.
He has advanced knowledge in the construction, operation, programming and testing of machines and robots.

Skills:
Is able to select engineering materials for applications in mechanics and machine construction.
Is able to design and implement a simple device, object, system or process, typical for machine construction, in accordance with the given specifications, using appropriate methods, techniques and tools.
Is able to select and apply manufacturing technologies to shape the form, structure and properties of products, and design technological processes.
Is able to take into account systemic and non-technical aspects, including ecological and environmental protection, in technical solutions - construction, technology and organization.
Is able to assess the usefulness of routine methods and tools used to solve a simple engineering task of a practical nature and to select and apply the appropriate method and tools.
Is able to obtain information from literature, databases and other properly selected sources.
Is able to prepare documentation regarding the implementation of an engineering task.
Is able to design a typical product, assembly, machine or system in accordance with given specifications, using appropriate methods and tools, and develop technical documentation.
Able to plan and organize individual and team work. Is able to independently plan and implement his own lifelong learning.
Is able to formulate and solve complex and unusual problems by obtaining information from literature, databases and other properly selected sources.
Is able to integrate the obtained information, interpret it and critically evaluate it.

Social competences:
Understands the need for lifelong learning; can inspire and organize the learning process of other people.
Is aware of the importance and understanding of non-technical aspects and effects of engineering activities, including its impact on the environment and the related responsibility for decisions made.
Able to cooperate and work in a group, taking on various roles.
Is able to appropriately define priorities for the implementation of tasks specified by himself or others.
Correctly identifies and resolves dilemmas related to the profession.
Able to think and act in a creative and entrepreneurial way.
Understands the need for lifelong learning; is aware of the need to critically analyze and evaluate its proposals and actions.
Is able to determine the importance of knowledge in solving cognitive and practical problems and to seek the opinion of experts in case of difficulties in solving the problem independently.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Design: Execution of the project in accordance with the adopted design data based on the analysis of the state of knowledge, technology or the accepted technical problem. The project is carried out individually. Ongoing verification of the progress of design work through cyclical presentations and exchange of views, thoughts, discussions, and exchange of experiences, which is to lead to solving design problems at individual stages.
Assessment criteria: project submitted to the instructor in paper (electronic) form, properly formatted according to the instructor's requirements. The final grade is the result of the evaluation of the presentation of the current progress of project work and activity in classes (25% of the grade) and the substantive evaluation of the completed project (75% of the grade).

Programme content

The project is implemented in the area of Mechanics and Machine Construction. It may concern the following topics related to the diploma process: structural mechanics, technological machine design, construction of vehicles and specialized machines, mechanical engineering and materials processing technology. Depending on the selected topic of the transitional work, the scope of the project varies (it is

presented by the instructor) and should include, among others: review of the state of the art, selection of concepts for construction/technological solutions and their analysis in terms of advantages and disadvantages, performance of the necessary analytical calculations and documentation (e.g. solid modeling, simulation calculations).
Projects:
Discussion of project topics
Directing students to choose design issues that correspond to the area of the diploma. Determining the scope of implementation of the transitional project depending on the project issues being implemented.
Presentation of the undertaken design issues
Students present a conceptually formulated construction/technology problem, which is discussed together on the forum. Exchange of experiences during substantive discussion with the teacher and other course participants.
Work on reviewing the state of the art and accepting output data for the project.
Students review the state of the art - they consult it with the instructor, who directs them to appropriate sources of information.
Preparation of concepts for construction/technological solutions and their analysis
As part of the project, students prepare concepts of solutions that meet the design assumptions, along with an analysis of their advantages and disadvantages. For this purpose, they make a short presentation of these concepts, which is then discussed in the group with the leader based on the exchange of opinions and experiences - discussion. On this basis, students select one concept for further design stages.
Project execution
Presentation of the project and consultation on the work performed in the scope previously agreed with the instructor
A short presentation of the completed project in accordance with the scope agreed on during the first class, together with a consultation in the group and with the instructor, a discussion based on the exchange of views and experiences (max. 10 minutes per person) with a discussion.
Completion of the project
Individual presentation and defense of the project and its assessment by the lecturer.

Course topics

none

Teaching methods

Project: Discussion, multimedia presentations, presentation and discussion of results during the inspection of student's work

Bibliography

Basic:
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Additional:
1. Indicated to the project author by the project leader.

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,00
Classes requiring direct contact with the teacher	60	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	90	3,50