



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Science of mechanics

### Course

Field of study

Aerospace Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr inż. Robert Kłosowiak

Responsible for the course/lecturer:

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Maszyn Roboczych i Transportu

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### Prerequisites

basic knowledge of general mechanics, physics, technical drawing. Logical and creative thinking, Internet use and library resources. Understands the need for continuous learning and acquiring new knowledge. Has general knowledge about the construction of machines, in particular energy machines.

### Course objective

The role of machines in energy conversion. Machine classification. Characteristic parameters of the machines. Mastering technical vocabulary, understanding the principles of operation of machines and devices.

### Course-related learning outcomes

Knowledge



1. has knowledge in the field of physics, covering the basics of classical mechanics, solid state physics, thermodynamics, necessary to understand issues in the field of theory of structural materials and materials science, theory of machines and mechanisms, theory of drives and mechatronic systems
2. has expanded knowledge necessary to understand profile subjects and specialist knowledge about construction, methods of construction, manufacture, operation, control, economic, social and environmental impact in the field of aviation engineering for selected specialties: 1. Aircraft pilotage 2. Aero engines and airframes
3. has a basic knowledge of the basic processes occurring in the life cycle of devices, objects and technical systems, as well as their technical description in the field of aviation engineering

#### Skills

1. knows how to use a language sufficient to understand technical texts in the field of aviation (knowledge of technical terminology)
2. has the ability to self-study using modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books
3. is able to analyze facilities and technical solutions, is able to search in the catalogs and on the manufacturers' websites ready components of machines and devices, including means of transport and storage, assess their suitability for use in own technical and organizational projects

#### Social competences

1. can appropriately define priorities for the implementation of tasks specified by himself or others based on available knowledge
2. Understands the need for critical assessment of knowledge and continuous learning
3. is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment, and the associated responsibility for decisions made

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

written final test

#### Programme content

Simplified machine design records. Hulls and bearing structures. Propulsion systems. Machine working bodies. Jet, turbine and rocket engines. Turbines, types, the essence of action. Pumps, division, construction, principle of operation. Gyms - division, function of elements. Unconventional energy machines. Heat pumps - operating principle, application.

PART - 66 (THEORY - 22.5 hours)

MODULE 3. BASIC INFORMATION ON ELECTRICITY



### 3.18 AC motor

Construction, principles of operation and properties of AC synchronous and induction motors, single and polyphase;

Methods of controlling the speed and direction of rotation;

Manufacturing methods of a rotating field capacitor, inductor, shaded and split pole [2]

#### Teaching methods

lecture

#### Bibliography

Basic

Gnutek, Z., and W. Kordylewski. "Maszynoznawstwo energetyczne." Oficyna Wyd. PWr, Wrocław (2003).

Jan Kijewski, Andrzej Miller -Maszynoznawstwo

J. Gronowicz - Maszynoznawstwo ogólne

J. Łęgiewicz - Poznaj samochód

Additional

Z. Tomaszewski - Wprowadzenie do techniki

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,2
Student's own work (literature studies, preparation for tests) <sup>1</sup>	20	0,8

<sup>1</sup> delete or add other activities as appropriate