



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Science of mechanics [S1Lot2>Masz]

### Course

Field of study

Aviation

Year/Semester

2/3

Area of study (specialization)

Unmanned Aerial Vehicles

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

15

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

1,00

### Coordinators

dr inż. Robert Kłosowiak

robert.klosowiak@put.poznan.pl

### Lecturers

### Prerequisites

basic knowledge of general mechanics, physics, technical drawing. Logical and creative thinking, using the Internet and library resources. Understands the need for continuous education and acquiring new knowledge. Has general knowledge of machine construction, in particular power machines.

### Course objective

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

### Course-related learning outcomes

Knowledge:

1. has extended and in-depth knowledge of mathematics including algebra, analysis, theory of differential equations, probability, analytical geometry as well as physics covering the basics of classical mechanics, optics, electricity and magnetism, solid state physics, thermodynamics, useful for formulating and solving complex technical tasks related to engineering aeronautical and modeling
2. has detailed knowledge related to selected issues in the field of construction of aircraft propulsion

systems

and the design of their components as well as their life cycles and principles of technical description

3. has a basic knowledge of the mechanisms and laws governing human behavior and psyche

Skills:

1. can solve tasks using basic knowledge of aerodynamics, flight mechanics and flow around a body

2. can analyze objects and technical solutions, can search in catalogs and on manufacturers' websites, ready

components of machines and devices, including means and devices, assess their suitability for use in their own

technical and organizational projects

Social competences:

1. understands that in technology, knowledge and skills very quickly become obsolete

### 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 supporting structures. Drive systems. Machine working organs. Jet, turbine and rocket engines. Turbines, types, essence of operation. Pumps, classification, construction, operating principle. Power plants - classification, function of elements.

Unconventional energy machines. Heat pumps - operating principle, application.

PART - 66 (THEORY - 11.25 hrs.)

MODULE 3. BASIC KNOWLEDGE FROM THE FIELD OF ELECTRICS

3.18 AC motor

Construction, operating principles and properties of synchronous and induction AC motor, single- and multi-phase;

Methods of controlling speed and direction of rotation;

Methods of manufacturing a rotating field capacitor, induction coil, shaded and split pole [2]

### Course topics

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### Teaching methods

lecture

### Bibliography

Basic:

Gnutek, Z., and W. Kordylewski. "Energy Machine Science." PWR Publishing House, Wrocław (2003).

Jan Kijewski, Andrzej Miller - Machine Science

J. Gronowicz - General Machine Science

J. Łęgiewicz - Get to know the car

Supplementary

Z. Tomaszewski - Introduction to technology

Additional:

-

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50