

## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Computer Aided Design

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### Course

Field of study

Aviation and cosmonautics

Area of study (specialization)

Year/Semester

2/3

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

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### Number of hours

Lecture

2

Laboratory classes

2

Other (e.g. online)

-

Tutorials

-

Projects/seminars

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### Number of credit points

4

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### Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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### **Prerequisites**

In mathematics, physics, mechanics, strength of materials and technical drawing in based level

Basic computer skills

Student can precisely formulate questions, understand the need for further education; He knows the limitations of his own knowledge and skills

### **Course objective**

Getting to know the basic numerical tools and methods of mechanical design and numerical simulation tools

### **Course-related learning outcomes**

#### Knowledge

knowledge in the field of mathematics, including algebra, analysis, theory of differential equations, probability, analytical geometry necessary to: describe the operation of discrete mechanical systems, understand the methods of computer graphics, describe the operation of electrical and mechatronic systems

basic knowledge of the main departments of technical mechanics: statics, kinematics and dynamics of a material point and a rigid body, and the strength of materials, including the basics of the theory of elasticity and plasticity, strain hypotheses, as well as methods of testing the strength of materials and the state of deformation and stress in structures

an ordered, theoretically founded knowledge in the field of engineering graphics and machine construction: technical drawing, object projection, basic principles of engineering graphics, the use of graphic computer programs CAD (Computer Aided Design) in machine construction

#### Skills

ability to self-educate with the use of modern didactic tools, such as remote lectures, websites and databases, didactic programs, e-books

ability to obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions

ability to assess the usefulness and use the tools integrated with packages for spatial modeling, and correctly interpret their results

#### Social competences

understands the need for lifelong learning; can inspire and organize the learning process of other people

aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment, and the related responsibility for decisions

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Oral and written tests. Assessment of the results of individual tasks

## Programme content

Introduction to computer aided design discussed on the basis of the product life cycle, virtual design, space discretization, 3D scanning, 3D printing, FEM - Finite Element Method, Computer Fluid Dynamics, aerospace, design optimization

## Teaching methods

Lectures, laboratory classes with examples tasks

## Bibliography

Basic

1. O.C. Zienkiewicz: Metoda Elementów Skończonych. WNT Warszawa 1977

2. M. Kleiber: Komputerowe Metody Mechaniki Ciał Stałych, PWN 1995, ISBN 83-01-11740-0

Additional

## Breakdown of average student's workload

|   | Hours | ECTS |
|---|-------|------|
| Total workload  | 110   | 4    |
| Classes requiring direct contact with the teacher   | 60    | 2    |
| Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup> | 50    | 2    |

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