



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Computer graphics [S1Trans1>GK]

### Course

Field of study

Transport

Year/Semester

1/2

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

30

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

dr hab. inż. Wojciech Karpiuk

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### Lecturers

### Prerequisites

**KNOWLEDGE:** The student has a basic knowledge of engineering graphics. The student knows how to operate the Windows operating system and understands the basic concepts related to this working environment. **SKILLS:** The student knows how to operate a computer and peripheral devices, is able to use the knowledge gained to analyse specific practical problems and make quick decisions. The student has good imagination and spatial orientation. **SOCIAL COMPETENCES:** The student is able to cooperate in a group and determine the tasks and priorities of their realization. The student demonstrates independence in solving problems and acquiring and improving the acquired knowledge and skills.

### Course objective

To provide students with information on the principles of modern CAD systems and basic spatial modelling methods. Students gain knowledge of systems for design automation and the skills to correctly record structures in the form of three-dimensional models, as well as to create associated technical documentation.

### Course-related learning outcomes

Knowledge:

The student knows the basic techniques, methods and tools used in the process of solving tasks in the

field of transport, mainly of an engineering nature engineering

#### Skills:

The student is able - in accordance with the given specification - to design (create a model of a fragment of reality), formulate a functional specification in the form of use cases, formulate non-functional requirements for selected quality characteristics) and implement a device or a widely understood system in the field of means of transport, using appropriate methods, techniques and tools  
The student has the ability to formulate tasks in the field of transport engineering and their implementation using at least one of the popular tools

#### Social competences:

The student understands that in technology, knowledge and skills very quickly become obsolete  
The student is aware of the social role of a technical university graduate, in particular, he/she understands the need to formulate and transfer to the society, in an appropriate style, information and opinions on engineering activities, technological achievements, as well as the achievements and traditions of the transport engineer profession

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Credit on the basis of partial marks + colloquium

### Programme content

#### Lecture:

As part of the course, learn about the functionality of a 2D CAD system (AutoCAD) by using constructions geometric constructions for drawing panel-type elements, creating documentation using rectangular projection, dimensioning, generating sections, layouts. Learning the possibilities of parameterisation in 2D, learning how to create parts as blocks with attributes. In the framework of 3D design (Autodesk Inventor Professional) creation of sketches (geometrical, dimensional and parametric constraints), dimensional and parametric constraints). Modelling of components and assemblies. Production of technical documentation, associativity of 3D/2D models. Modelling of sheet metal and welded structures. Designing assemblies using adaptability. Animation, visualisation of parts and assemblies. Simulation dynamic simulation of mechanisms. Practical learning of the principles of exchanging graphical information between systems  
CAx.

#### Exercises

Working with Autodesk Inventor:

1. familiarisation with the program + working on sketches

2. basic programme functions

Solid modeling

4. sheet metal constructions

5. documentation

6. assembly creation

7 Composite modelling

### Course topics

#### Exercises

Working with Autodesk Inventor

Getting to know the programme + working on sketches

Basic program functions

-extracting

-dropping geometry

-mirroring

-chamfering

-rounding

Modelling solid elements

-rotation

-circle

-controlled dimensioning

-holes

-deviation

Sheet metal structures

- creation of structures (bending, folding, flanges, creation of text, etc.)

creation of documentation

- creation of a documentation file based on the sheet metal design obtained

- editing a drawing plate

- working with different plan views

- description of the document (dimensions)

Creation of assemblies

Composite modelling

## Teaching methods

Multimedia presentation, Interactive practical example, individual and team project tasks.

## Bibliography

1. Andrzej Pikoń, AutoCAD 2018 PL. Gliwice : Helion, copyright 2018.
2. Krawiec Piotr (red.), Grafika komputerowa dla mechaników (wyd. VI zmienione i rozszerzone) wyd. Politechniki Poznańskiej, 2020.
3. Autodesk Inventor 2022 PL/2022+ Fusion 360 : podstawy metodyki projektowania / Andrzej Jaskulski. Gliwice : Helion SA, © 2021.
4. Zbiór ćwiczeń : Autodesk® Inventor® 2020 : kurs podstawowy / Fabian Stasiak. [Wola Grzymkowa] : EkspertBooks, © 2019.
5. Modele parametryczne w przykładach dla Autodesk Inventor / Sebastian Rzydzik. Gliwice : Wydawnictwo Politechniki Śląskiej, 2019.
6. Projektowanie elementów maszyn z wykorzystaniem programu Autodesk Inventor : reduktor jedno- i dwustopniowy / Paweł Płuciennik. Warszawa : Wydawnictwo Naukowe PWN, cop. 2017.
7. Zapis konstrukcji z zastosowaniem modelowania komputerowego / Krzysztof Psiuk, Adam Cholewa. Gliwice : Wydawnictwo Politechniki Śląskiej, 2017.
8. Autodesk Inventor 2014 : oficjalny podręcznik / Thom Tremblay ; [tł. Piotr Cieślak]. Gliwice : Wydawnictwo Helion, cop. 2014.

## Breakdown of average student's workload

	Hours	ECTS
Total workload	70	3,00
Classes requiring direct contact with the teacher	30	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	40	1,50