COURSE DESCRIPTION CARD - SYLLABUS

Course name

Engineering graphics and CAD

Course

Field of study

Education in Technology and Informatics

Year/Semester

1/2

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

26

Laboratory classes

30

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Piotr Krawiec prof. PP

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Faculty of Mechanical Engineering

ul. Piotrowo 3, 60-965 Pozna

Responsible for the course/lecturer:

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tel. 61 665 2053

Faculty of Mechanical Engineering

ul. Piotrowo 3, 60-965 Poznań

Prerequisites

1) Basic knowledge of elementary geometry and stereometry, knowledge of computer science - ability to work in the Windows operating system, efficient use of Microsoft Office

2) The ability to solve problems based on the acquired knowledge, the ability to obtain information from the indicated sources.

3) Understanding the necessity of expanding one's knowledge and training skills, as well as independence and consistency in carrying out tasks and solving problems.

4) Can work in a group by performing various roles.

Course objective

Getting to know the methodology of designing parts and assemblies in a 3D system, acquiring the ability to prepare 2D technical documentation as well as visualization of designed products. The use of knowledge in the field of classical structure notation. Developing the ability to create drawing documentation using computer tools; shaping the ability to read technical drawings

Course-related learning outcomes

Knowledge

1) The student has well-structured knowledge on the principles of technical drawing - [K1_W09]

2) The student understands the importance of normalization in engineering graphics, and the role of CAD software in engineering - [K1_K09]

3) The student understands the primary role of an engineer in the computer-aided preparing of technical drawings - [K1_K18]

Skills

1) The student can draw basic structural components and use dimensions - [K1_U06]

2) The student can use CAD software for drafting - [K1_U09]

3) The student can use the information communication technologies to complete the typical engineering tasks - [K1_U13]

4) The student has the ability of self-study - [K1_U02]

Social competences

1) The student can work individually on assigned task - [K1_K01]

2) The student understands the need for lifelong learning - [K1_K03]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Written exam in the form of open tasks or a selection test.

Computer laboratory classes: final credit

Programme content

1. Introduction, standardization in engineering drawing.
2. Projection of 3D objects on the plane of the drawing.
3. Presentation of object interior with the use of sectional views, types of sectional views.
4. Presentation of object cross-section with the use of revolved section.

5. The application of geometrical constructions for drawing the objects.

6. Lines of intersection of typical solids.

7. Dimensioning.

8. Tolerances for production drawings and fits for assembly drawings.

9. Geometrical Product Specification.

10. Production drawings for shaft and hub. Splines.

11. Production drawings for gear wheels.

12. Assembly drawings of screw joints and splined connections.

13. Simplifications for rolling bearings drawings.

14. The principles of drawing welds and welded joints.

15. The design of bearing modulus.

16. The analysis ("reading") of assembly drawings.

17. Historical outline of CAD, Raster graphics, vector graphics, 2D graphics. Application areas of CAD, CAM, CAE systems. Place of computer graphics in Computer Integrated Manufacturing CIM. Practical knowledge of the possibility of parameterization, adaptability and variants in professional CAD systems. During laboratory classes, the implementation of the product design process in the 3D system through preliminary design, 3D model, 2D documentation, assembly of the team, animation of the product's operation.

Teaching methods

Lecture: Multimedia presentation with examples

Laboratory: performing tasks, problem method, project method

Bibliography

Basic

1. Krawiec Piotr (red.), Grafika komputerowa dla mechaników (wyd. VI rozszerzone i zmienione), wyd. Politechniki Poznańskiej, 2020.

2. Foley J., Dam A., Hughes J., Phillips R., Wprowadzenie do grafiki komputerowej, Warszawa, WNT 2001.

3. Kiciak P., Podstawy modelowania krzywych i powierzchni: zastosowania w grafice komputerowej, Warszawa, WNT 2000.

4. Dobrzański T., Rysunek techniczny maszynowy, WNT, W-wa 1997.

5. Lewandowski T., Rysunek techniczny dla mechaników, WSiP, W-wa 2009.

6. Bajkowski J., Podstawy zapisu konstrukcji, Oficyna Wyd. Polit. Warszawskiej, 2014

7. Bober A, Dudziak M., Zapis konstrukcji, PWN, W-wa 1999.

Additional

1. Krawiec Piotr (red.), Grafika komputerowa (wyd. V rozszerzone) wyd. Politechniki Poznańskiej, 2011.

2. Dudziak Marian, Krawiec Piotr, Wspomaganie projektowania i zapisu konstrukcji, Wydawnictwo PWSZ w Kaliszu, 2012.

3. Jankowski W. Geometria Wykreślna. Wydawnictwo P.P. 1999 r.

Breakdown of average student's workload

	Hours	ECTS
Total workload	86	4
Classes requiring direct contact with the teacher	56	3
Student's own work (literature studies, preparation for laboratory classes, preparation for tests/exam) [1]	30	1

[1] delete or add other activities as appropriate