COURSE DESCRIPTION CARD - SYLLABUS

Course name

Engineering drawing with projective geometry

Course

Field of study

Mechatronics

Year/Semester

1/1

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

Polski

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

2

Laboratory classes

1

Other (e.g. online)

0

Tutorials

0

Projects/seminars

1

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Piotr Krawiec

Wydział Inżynierii Mechanicznej

Instytut Konstrukcji Maszyn

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tel. 61 665 2242

Responsible for the course/lecturer:

dr inż. Maciej Berdychowski

Wydział Inżynierii Mechanicznej

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Prerequisites

Fundamental knowledge on geometry and stereometry.

Efficient use of the Windows operating system. The ability to obtain information from the indicated sources and readiness to cooperate as part of the team.

Course objective

Mastership of basic principles of image construction of spatial objects on the plane. Training of spatial imagination.

Learning the methods and principles of engineering drawing. Practical skills of preparing the technical documentation. Skills of "reading" the engineering drawing.

Acquiring the ability to perform 2D and 3D technical documentation as well as visualization of designed products with the use of a professional computer system for recording the structure. Harmonious connection of computer techniques with information on the classical notation of structures.

Course-related learning outcomes

Knowledge

Has basic knowledge of engineering graphics, in the field of projection, geometric shaping of technical forms with the use of polyhedra, solids and surfaces. He knows the elements of a technical drawing, mapping and dimensioning of machine elements, sections, tears, lines, presenting typical elements, normalization in the construction record, rules for creating assembly diagrams and drawings, graphic methods of presenting connections of machine elements, marking surface features of elements. He has knowledge in the field of construction recording in electrical engineering and electronics and the operation of CAD systems (eg Catia, Pro / Engineer). This knowledge allows for creating technical drawings of machine elements and reading drawings and diagrams of machines, devices and technical systems. It enables to describe their structure and principles of operation

Skills

1. Can prepare descriptive and drawing technical documentation

2. Has the ability to self-educate with the use of modern didactic tools.

3. Can use popular packages for editing technical drawings and 2D and 3D modeling to the extent enabling the creation of drawing documentation in accordance with the applicable drawing standards

Social competences

1. Understands the need and knows the possibilities of continuous training

2. Is aware of the importance and understands the non-technical aspects and effects of the activity of a mechanical engineer and its impact on the environment, as well as responsibility for decisions made

3. Is aware of the importance of professional behavior, adherence to the principles of professional ethics and respect for cultural diversity

4. Is aware of responsibility for his own work and readiness to submit to the principles of teamwork and responsibility for jointly performed tasks

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

1. Lecture: Written exam consisting of theoretical and practical parts. The theoretical part consists of a set of 3-5 questions, while the practical part consists of 2-3 technical drawings.

2. Laboratory: credit based on the completed tasks / exercises.

3. Projects: credit based on the completed tasks / exercises.

Programme content

Lecture:

1. Introductory information, standardization in the construction record. History of engineering graphics, raster graphics, vector graphics, 2D / 3D graphics. Place of engineering graphics in Komputerowo Integrated Wytwarzaniexx. Practical knowledge of the possibility of parameterization and variants in professional CAD systems.
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.

Projects:

1. Fundamentals of projective geometry
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.

Laboratory:

Basic principles of creating technical documentation using the CAD program. Technique of working with the CAD program. Editing the drawing, blocks, document properties and lines. Working with layers when creating 2D documentation. Preparation of documentation for publication.

Teaching methods

1. Lecture: multimedia presentation, supplemented with examples given on the board

2. Projects: Illustrated teaching boards or multimedia presentations, supplemented with examples on the board; performing the tasks given by the teacher ¬ practical exercises

3. Laboratory: Performing tasks given by the teacher ¬ practical exercises consisting in creating technical documentation with the use of AutoCad software.

Bibliography

Basic

1. Dobrzański T., Rysunek techniczny maszynowy, WNT, W-wa 2019r.

2. Lewandowski T., Rysunek techniczny dla mechaników, WSiP, W-wa 2014r.

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

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

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

Additional

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

2. Krawiec Piotr (red.), Grafika komputerowa (wyd. VI rozszerzone) wyd. Politechniki Poznańskiej, 2020.

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

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	75	3,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	50	2,0

[1] delete or add other activities as appropriate