



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of Machine Design

Course

Field of study

Aerospace Engineering

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

18

Laboratory classes

0

Other (e.g. online)

0

Tutorials

9

Projects/seminars

9

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

DSc Eng. Michał Śledziński

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Piotrowo 3 Street, 61-138 Poznań

Prerequisites

1 Knowledge: knowledge of physics (statics, kinematics and dynamics), mathematics, after completing the program of study.

2 Skills: problem-solving skills of the basics of machine design based on their knowledge, ability to obtain the information from identified sources.

3 Social competencies: understanding of the need to broaden their competence, willingness to work together as a team.

Course objective

1. Provide students with knowledge of the basics of machine design.



2. Develop students' skills:

- calculation and design of components and assemblies of machines,
- making and reading the technical documentation on the basis of the knowledge from the subject of Engineering Drawing,
- practical use of the knowledge gained from the course: Mechanics, Strength of materials, Theory of machines, Materials.

3. Development of students' teamwork skills.

Course-related learning outcomes

Knowledge

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

Skills

1. Is able to create a circuit diagram, select elements and perform basic calculations of the electrical and electronic system of sets of aircraft machines or devices.
2. Is able to organize and substantively manage the design and operation of a simple on-board device, machine or technical flying facility from the group covered by the selected specialty.
3. Is able to analyze objects and technical solutions, is able to search in catalogs and on manufacturers' websites ready components of machines and devices, including means and transport and storage devices, assess their suitability for use in their own technical and organizational projects.

Social competences

1. Understands the need to learn throughout life; can inspire and organize the learning process of other people.
2. Is able to properly define the priorities for the implementation of a task set by himself or others.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Forming assessment:

- a) in a scope of the project: assessment of current progress of the project
- b) in a scope of lectures: assessment of the answers for the questions concerning the knowledge which was presented during previous lectures
- c) in a scope of classes: solving tasks by a blackboard

Summarizing assessment:



- a) in a scope of project: assessment of the course of work on the project and the final result of the project
- b) in a scope of lectures: written exam
- c) in a scope of classes: written exam with tasks to solve.

Programme content

The basic principles of the design process, elements of the mechanism, the characteristics of workloads, defining loads and appropriate strenght conditions. Connections and their calculation: soldered, welded, glued, riveted joints, fasteners: T-slot nuts, bolt, screw connections. Screw mechanisms: examples and applications, structural calculations. Susceptible elements: springs, rubber components susceptible. Axes, shafts and their bearings. Clutches and brakes. Gearboxes in drive systems.

Teaching methods

Presentation from lecture, tast in exercises, individual projects.

Bibliography

Basic

1. Praca zbiorowa pod red. Z. Osińskiego, Podstawy konstrukcji maszyn, PWN, W-wa, 1999
2. Praca zbiorowa pod red. M. Dietricha: Podstawy konstrukcji maszyn. Tom 3, WNT, Wa-wa, 1999
3. Osiński Zbigniew, Sprzęgła, PWN, Warszawa 1998
4. Dziama A., Michniewicz M., Niedźwiedzki A.: Przekładnie zębate. PWN, Wa-wa, 1989.
5. Ochęduszko K.: Koła zębate, WNT 1985.6. Dudziak M.: Przekładnie cięgnowe. PWN, Warszawa, 1997.

Additional

1. Niemann G., Maschinenelemente t. I, II, III, Springer Verlag Berlin, 1965
2. Müller L., Przekładnie obiegowe, PWN, Warszawa, 1983
3. Bahl G., Beitz W., Nauka konstruowania, WNT, Warszawa 1984

Breakdown of average student's workload

	Hours	ECTS
Total workload	108	4,0
Classes requiring direct contact with the teacher	36	2,0
Student's own work (literature studies, preparation for tutorials, preparation for tests/exam, project preparation) ¹	72	2,0

¹ delete or add other activities as appropriate