



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Materials technology and theory of chemical machines - load-bearing structures [S1IChiP1>MiMCKn]

### Course

Field of study	Year/Semester
Chemical and Process Engineering	2/3
Area of study (specialization)	Profile of study
–	general academic
Level of study	Course offered in
first-cycle	Polish
Form of study	Requirements
full-time	elective

### Number of hours

Lecture	Laboratory classes	Other
0	0	0
Tutorials	Projects/seminars	
0	15	

### Number of credit points

2,00

### Coordinators

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### Lecturers

### Prerequisites

Knowledge in the field of mathematics, physics and the basics of technical drawing and engineering graphics. Ability to read and understand technical drawings. Readiness to make decisions and cooperation within a given team, awareness of the need to expand their knowledge.

### Course objective

Getting acquainted with fittings occurring in the constructions of industrial apparatus and devices. Transfer of knowledge in the field of calculation of flat bar systems including tools for computer-aided calculations. Acquiring engineering skills in own designing of a truss structure that keeps the tank in a vertical or horizontal position.

### Course-related learning outcomes

Knowledge:

1. the student knows the basic forces operating in the supports of camera construction, [k\_w5, k\_w13]
2. the student knows selection criteria for construction materials for process equipment components, [k\_w15]
3. the student knows calculation methods for the determination of flat bar systems, k\_w15

4. the student knows the process of designing the structure of the truss keeping the tank in a vertical or horizontal position, [k\_w15]

Skills:

1. the student can choose the right type of construction material in the process of designing process apparatus, [k\_u1, k\_u14]
2. the student know how to apply different methods for the determination of flat bar systems, [k\_u20]
3. the student know how to choose a computer program to speed up the design process, [k\_u6]
4. the student can design a truss structure that keeps the tank in a vertical or horizontal position, [k\_u20]

Social competences:

1. the student is aware of the limits of his own knowledge, and therefore the need for education and development, [k\_k1]
2. the student knows the advantages and disadvantages of team work and adheres to the principles accompanying this way of solving problems in industry, [k\_k4]
3. the student can think and act in a creative and enterprising way, [k\_k5]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Skills acquired in the project classes are verified on the basis of the preparation of individual project task and passing the classes in the form of oral verification of the submitted project, consisting of 3-5 open-ended questions related to the project. Passing threshold: 51% of points from oral answer and the correctness of prepared project task.

### Programme content

Acquiring engineering skills to independently design a truss structure that holds a tank in a vertical or horizontal position.

### Course topics

As a part of the course, theoretical basics and calculation methods regarding flat bar systems (trusses, beams and frames) with particular emphasis on truss systems. Presentation of tools for computer-aided calculations of flat bar systems. Practical strength calculations of apparatus components such as supports and load-bearing structures that holding the apparatus in a vertical or horizontal position will be presented.

### Teaching methods

Multimedia presentation illustrated with examples given on the board, and completing tasks given by the teacher - practical exercises.

### Bibliography

Basic

1. Leyko J., Mechanika ogólna, PWN, Warszawa 1978.
2. Blum A., Kratownice, AGH Uczelniane Wydawnictwa Naukowo-Dydaktyczne, Kraków 2004.
3. Jastrzębski P., Solecki R., Szymkiewicz J., Kratownice. Obliczenia statyczne, Arkady, Warszawa 1970.
4. Gawęcki A., Mechanika materiałów i konstrukcji prętowych. Tom 1 i 2., Wydawnictwo Politechniki Poznańskiej, Poznań 1998.

Additional

1. Leyko J., Szmelter J., Zbiór zadań z mechaniki ogólnej. Tom 1 i 2, PWN, Warszawa 1983
2. Mieszczerski I.W., Zbiór zadań z mechaniki, PWN, Warszawa 1969
3. Kucharski T., Mechanika ogólna: rozwiązywanie zagadnień z MATHCAD-em, WNT, Warszawa 2002

### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	2,00
Classes requiring direct contact with the teacher	60	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	40	1,00