POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mechanics

Course

Field of study	Year/Semester
Mechatronics	I/2
Area of study (specialization)	Profile of study
-	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	0	0
Tutorials	Projects/seminars	
15	0	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Jacek Buśkiewicz

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tel. 61 665 26 19

Institute of Applied Mechanics

Faculty of Mechanical Engineering

ul. Jana Pawła II 24, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

General knowledge on physics. Knowledge of mathematics including algebra, trigonometry, vectors, derivatives, integrals.

Course objective

To obtain the ability to mechanically describe motion of material systems and structures. To prepare for mechanical analysis of complex mechanical system.

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Course-related learning outcomes

Knowledge

1. To define basic mechanical terms and give practical examples.

2. A knowledge of statics which enables to solve the equilibrium of planar and spatial systems, to determine the reaction forces, to analyse equilibrium of structures. Ordered theoretically founded knowledge of kinematics of a point and systems of points as well as of rigid body.

3. To formulate and explain fundamental physical laws, mechanical theorems. To formulate the limitations and the extent of applicability in physical phenomena modelling.

4. To explain the importance of simplified mechanical models.

Skills

1. To extract information from the literature, databases and other properly selected sources, ability to reconstruct reasoning described in literature regarding taken assumptions and simplifications.

2. To exploit relevant analytical methods, formulate and solve simple engineering problems.

3. To communicate effectively with specialists as well as with non specialists in the field of engineering.

4. To specify ways of further acquisition of knowledge and skills in file of mechanism theory.

Social competences

1. The student understands the need of life-long learning, of inspiring and organising other person's teaching process.

2. Is aware of importance of basic engineering knowledge and its importance in solving simple engineering problems.

3. Understands the need for popularisation of knowledge of mechanical engineering.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Practice (tutorials): colloquiums: criteria of assessment 3.0 (50%-70%), 4.0 (71%-90%), 5.0 (>90%).

Lecture: theoretical test: criteria of assessment 3.0 (50%-70%), 4.0 (71%-90%), 5.0 (>90%).

Programme content

1.   Basic terms and definitions of mechanics.

2.   Statics of planar system of forces.

3.   Lattice.

4.   Elements of spatial statics.

5. Friction.

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6.   Kinematics of point in Cartesian and natural coordinate systems.

7.   Kinematics of rigid body: translational, rotational and planar.

Teaching methods

1. Lecture: the presentation ilustrated with examples and problems solutions written down on the blackboard.

2. Practice: the problems solved by students and a lecturer, duscussion on different concepts of solutions.

Bibliography

Basic

1. Mechanics. In polish: Mechanika ogólna, tom I i II, J. Leyko, PWN, Warszawa, 1996.

2. Mechanics. In polish: Mechanika techniczna, tom I i II, J. Misiak, WNT, Warszawa, 1996.

3. Engineering Mechanics, D.J. McGill, PWS Publishers, Boston, 1985.

4. Analytical Mechanics for Engineers, F.B. Seely, N.E. Ensign P.G. Jones, Wiley, New York, 1958.

Additional

1. Problems on mechanics. In polish: Zadania z mechaniki ogólnej tom I i II, J. Misiak, WNT, Warszawa, 2009.

2. Methodology of solving theoretical mechanics problems. In polish: Metodyka rozwiązywania zadań z mechaniki, J. Nizioł, WNT, Warszawa, 2007.

3. Problems on mechanics. In polish: Zbiór zadań z mechaniki ogólnej, M. T. Niezgodzińscy, Wydawnictwo Naukowe PWN, Warszawa, 2009.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	30	2,0
Student's own work (literature studies, preparation for classes, preparation for tests,) [1]	45	1,0

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[1] delete or add other activities as appropriate