COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics

Course

Field of study
Aerospace Engineering

Year/Semester
1

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
18	9	0
Tutorials	**Projects/seminars**	
9	0	

Number of credit points

5

Lecturers

Responsible for the course/lecturer:
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Wydział Inżynierii Materiałowej i Fizyki Technicznej

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Responsible for the course/lecturer:
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Prerequisites

Basic knowledge concerning physics and mathematics. Solving elementary physical problems based on acquired knowledge, ability to acquire information from given sources. Understanding of necessity of own competence broadening, readiness to cooperate within group

Course objective

Educate students in the basic concepts and physical laws in the field of classical physics, including their applications in technical sciences, develop students 'skills to solve problems in the field of technical physics, recognize its potential applications in the studied field, develop students' teamwork skills.

Course-related learning outcomes

Knowledge

Advanced knowledge within classical mechanics, thermodynamics, gravity and electrical interactions with special emphasis on their applications in studied subject. Basic knowledge about constructing, principles of working and lifetime of modern engineering systems.

Skills

Can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions

Social competences

1. Understands the need for lifelong learning; can inspire and organize the learning process of other people

2. Is ready to critically evaluate the possessed knowledge and perceived content, recognize the importance of knowledge in solving cognitive and practical problems, and consult experts in the event of difficulties in solving the problem on its own

3. Is aware of the social role of a technical university graduate, and especially understands the need to formulate and transmit to the society, in particular through the mass media, information and opinions on the achievements of technology and other aspects of engineering activities; makes efforts to provide such information and opinions in a generally comprehensible manner

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

LECTURE: Assessment of knowledge and skills in a written or oral exam based on the explanation of selected issues

TUTORIALS: assessing the solutions of the tasks in the exercises, final test.

LABORATORY: Preparation of reports on the implementation of individual laboratory exercises. Optional assessment of students' knowledge prior to the implementation of the classes

Programme content

1. material point kinematics (rectilinear and curvilinear motion),

2.material point dynamics (Newton's laws of motion, friction, momentum, work, power and energy)

3. dynamics of a rigid body (moment of force, moment of inertia, Steiner theorem, principles of dynamics of rotational motion, angular momentum, kinetic energy of rotational motion),

4. conservation principles in mechanics (conservation principle: momentum, angular momentum, energy),

5. body collisions (perfectly elastic and inelastic), statics of a rigid body (simple machines),

6.simple harmonic motion: (free, forced? Resonance)

7.mechanical waves (wave refraction and reflection, the phenomenon of diffraction and interference, the Doppler effect, basics of acoustics),

8. gravitational interactions

9. basics of special relativity

10.electric field (Coulomb's law, electric field strength and potential, work of electric field forces)

11.magnetic field (Lorentz force, electrodynamic force),

12.Electromagnetic induction (flux of induction, Faraday's law of induction, Lenz's law),

electromagnetic waves (Maxwell's equation)

Teaching methods

Informative (conventional) lecture (providing information in a structured way) - may be of a course (introductory) or monographic (specialist) character

Exercises, problem solving and interpretation of calculation results,

Laboratory (experiment) method (students independently conduct experiments)

Bibliography

Basic

1. D. Halliday, R. Resnick, J. Walker, "Podstawy fizyki" t. I - IV, PWN, Warszawa 2005,

2. J. Massalski, M. Massalska, "Fizyka dla inżynierów" t.I, WNT, Warszawa 2006.

3. K. Jezierski, A. Kołodka, K. Sierański, "Fizyka-zadania z rozwiązaniami", t. 1-2, Wydawnictwo Scripta, Wrocław 2009,

4. J.Kalisz, M. Massalska, J. Massalski. "Zbiór zadań z fizyki z rozwiązaniami", PWN, Warszawa 1971.

Additional

1. . Cz. Bobrowski, "Fizyka - krótki kurs dla inżynierów", WNT, Warszawa 2004

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	60	20,0
Student's own work (literature studies, preparation for math exercises, preparation for tests/exam) [1]	65	3,0

[1] delete or add other activities as appropriate