

Course description

Course abbreviation: KFY/FYZS1
Course name: Seminar - Physics 1
Academic Year: 2016/2017

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Department/Unit /	KFY / FYZS1	Academic Year	2016/2017
Title	Seminar - Physics 1	Type of completion	Pre-Exam Credit
Accredited/Credits	Yes, 1 Cred.	Type of completion	Written
Number of hours	Seminář 1 [Hours/Week]	Course credit prior to	NO
Occ/max	Status A Status B Status C	Counted into average	NO
Summer semester	0 / - 0 / - 0 / -	Min. (B+C) students	not determined
Winter semester	0 / - 35 / - 0 / -	Repeated registration	NO
Timetable	Yes	Semester taught	Winter semester
Language of instruction	Czech	Internship duration	0
Substituted course	None		
Preclusive courses	N/A		
Prerequisite	N/A		
Informally recommended courses	N/A		
Courses depending on this Course	N/A		

Course objectives:

Solution of experimental and computational problems of KFY/FYPX1 and KFY/FYPY1 courses. Basic experiments and tasks.

Requirements on student

Requirement for the successful completion of the course is achieving of specified results in individual work. Well-arranged knowledge of definitions in the secondary-school range of mechanics, molecular physics and thermodynamics. Classification is in accordance with the Study and examination regulations of OU (1.9. 2015).

Content

1. Mechanics of fixed element. Classification of fixed element motions. Newton's laws of motion. Force and momentum. Dissipative forces. Mechanical work and energy. The law of mechanical energy conservation. Inertia force.
2. Mechanics of fixed elements system and solids. Pulse theorem. Laws of momentum and moment of momentum conservation. Center of gravity. Composition of forces counteracting on center of gravity and their balance. Moment theorem. Simple engines. Moment of inertia.
3. Gravitational field and fluids mechanics. Kepler's laws. Newton's gravitational law. Earth's gravitational and acceleration of gravity field. Movements of bodies in the homogenous acceleration of gravity and nonhomogenous gravitational field. Pressure in the fluid. The equation of balance and fluids statics laws. Equation of flow continuity, Bernoulli's equation. Laminar and turbulent flow. Basics of flight physics.
4. Thermodynamics and phase transitions. Basic definitions of thermodynamics, thermodynamic system and its internal energy, work in thermodynamics. Thermodynamic principles, entropy. Thermal machines. Phase transitions of 1st form. State changes. Phase diagram. Triple point.
5. Molecular phenomena. Molecular phenomena in fluids, surface tension, capillary pressure, elevation and depression. Temperature and its measurements. Thermal expansion of material. Processes in ideal gas. Status equation.
6. Structure of solids, elasticity. Molecular structure of solids, fluids and gases. Coupling in solids. Hook's law. Small deformations of solids during tension, compression and sliding.

Prerequisites - other information about course preconditions

none

Competences acquired

The student is able to resolve problems of theory of mechanics, molecular physics and thermodynamics.

Fields of study**Guarantors and lecturers**

- **Guarantors:** RNDr. Libuše Švecová, Ph.D.
- **Seminar lecturer:** RNDr. Libuše Švecová, Ph.D.

Literature

- **Basic:** Sklenák, L., Dvořák, D. *Fyzika pro střední školy - mechanika*. Praha, 1997. ISBN 80-7168-445-7.
- **Basic:** SKLENÁK, L. *Seminář z mechaniky učební text katedry fyziky PřF OU. Ostrava, 2002..*
- **Recommended:** HORÁK, Z., KRUPKA, I. *Fyzika*. Praha, 1966.
- **Recommended:** HALLIDAY, D., aj. *Fyzika. Část 1, 2. Brno: VUTIUM, Praha: PROMETHEUS 2000. ISBN 80-214-1868-0 (VUTIUM), ISBN 81-7196-213-9 (PROMETHEUS).*
- **Recommended:** HLAVIČKA, A., aj. *Fyzika pro pedagogické fakulty. 1.díl.* Praha, 1971.
- **Recommended:** SVOBODA, E., BAKULE, R. *Molekulová fyzika.* Praha, 1992. ISBN 80-200-0025-9.
- **Recommended:** Příklady k řešení - <http://artemis.osu.cz:8080/artemis/view.php?ids=10&idr=89&idc=136> >
- **Recommended:** SYROVÝ, A. *Sbírka příkladů z fyziky*. Praha, 1971.

Time requirements

Activities	Time requirements for activity [h]
Being present in classes	13
Self-tutoring	12
Consultation of work with the teacher/tutor (incl. electronic)	5
Total:	30

assessment methods**professional knowledge**

- Continuous analysis of student's achievements
- Written examination

teaching methods**professional knowledge**

- Briefing
- Dialogic (discussion, dialogue, brainstorming)

learning outcomes**professional knowledge - knowledge resulting from the course:**

The student is able to resolve problems of theory of mechanics, molecular physics and thermodynamics.

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Applied Physics	Bachelor	Full-time	Biophysics	1	2014	2016	Povinně volitelné předměty	B	1	ZS
Applied Physics	Bachelor	Full-time	Biophysics	1	2012	2016	Povinně	B	1	ZS

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Chemistry	Bachelor	Full-time	Chemistry	1	2012	2016	volitelné předměty Povinně volitelné předměty	B	1	ZS