(faculty stamp)

COURSE DESCRIPTION

1. Course title: PHYSICS	**2. Course code:** PHY
3. Validity of course description: 2018/2019	
4. Level of studies: BSc	
5. Mode of studies: intramural	
6. Field of study: Informatics	**Faculty symbol:** ACECS
7. Profile of studies: academic	
8. Programme: -	
9. Semestr: 2 (Lectures, Classes), 3 (Lectures, Classes, Laboratory)	
10. Faculty teaching the course: ACECS – Institute of Electronics (RAu3)	
11. Course instructor: D.Sc. Monika KWOKA – Assoc.Prof.	
12. Course classification: common	
13. Course status: compulsory	
14. Language of instruction: English	
15. Pre-requisite qualifications: Course attendants are supposed to have the general knowledge concerning physics and mathematics at the level of secondary school, what allows the understanding of main physical phenomena around us in the nature.	
16. Course objectives: The aim of course is to explain the common physical phenomena in the nature, combined with their mathematical description, mainly for application in modern engineering sciences including informatics.	

17. Description of learning outcomes:[1]

No	Learning outcomes description	Methods of assessment	Teaching methods	Learning outcomes reference code
W2	Possesses knowledge In the field of physics including mechanics, thermodynamics, electromagnetism, optics, atomic physics necessary for understanding of basic physical phenomena in nature with potential application in electronics	Examination	Lectures (Multimedia)	K1A_W03
W2	Knows methodology of solving of physical tasks within the scope of lectures	Colloqium	Classes	K1A_W04
U1	Is able to perform the simple measurements of basic physical quantities	Colloqium	Laboratories	K1A_U09
U2	Is able to perform the analysis of experimental results, and then to determine the basic physical parameters	CL, PS, OS	Laboratories	K1A_U10 K1A_U13
K1	Is able to think and work creatively, also in group, within the solving the specific tasks (calculations, measurements)	CL, PS, OS	Laboratories	K1A_K04

18. Teaching modes and hours

Lectures: 30 Classes: 30 Laboratory: 30 P. Sem.

[1] należy wskazać ok. 5 – 8 efektów kształcenia

19. Syllabus description:

LECTURES:

Semester 2:
Introduction to physical universe – Aim and scope of the course
Kinematics and dynamics of material point and rigid body
Motion in inertial and non-inertial frames
Conservation principles in mechanics
Mechanical vibrations
Wave motion and sound propagation
Thermal effects in nature – role of temperature
Thermal gas transitions and kinetic theory of gases
Thermodynamics of gases and potential application
Mechanics of fluids in nature

Semester 3:
Gravitational field
Electrostatic field including dielectric phenomena
Magnetic field including electromagnetic induction
Electromagnetic radiation in nature
Wave optics
Quantum optics
Wave properties of matter
Atomic spectra and classical atomic models
Quantum mechanics including quantum model of atoms
Band structure of solids including semiconductors.

Classes:

Semester 2:
Physical quantities, vectors and fundamentals of mathematical analysis
Kinematics and dynamics of material point and rigid body
Conservation principles for material point and rigid body
Mechanical vibrations in nature
Wave propagation and sound waves
Gas transitions and kinetic theory of gases
Thermodynamics of ideal gas

Semester 3:
Gravitational field in the nature
Electrostatic field including dielectric phenomena
Magnetic field including electromagnetic induction
Electromagnetic radiation and wave optics
Quantum optics and related effects
Atomic spectra in the nature
Bohr model of atoms and related effects

Laboratories:

Determination of the following physical parameters: gravitational acceleration g, moment of inertia of rigid body, coefficient of viscosity, focus of lenses, constant of diffractive mesh by light diffraction, work fuction of metals, lifetime of carriers in semiconductors, carrier concentration by Hall effect, absorption of beta radiation, spectral characteristics of excited atoms.

20. Examination: written form with additional discussion (optional)

21. Primary sources:

1. M.Mansfield, C.O'Sulivan: *Understanding Physics*, Wiley and Sons, Inc., New York, 1998.
2. R. Resnick, D. Halliday, J. Walker: *Fundamentals of Physics*, Wiley and Sons Inc. New York, 2001.
3. M. Kwokar: Lecture's in the form of multimedia presentations available on request in electronic version.

22. Secondary sources:

1. J.S.Walker: *Physics,* Pearson, New York, 2004.
2. H.D.Young, R.A.Freedman: *University physics*, Vol.1-3, Pearson, New York, 2004.

23. Total workload required to achieve learning outcomes

No.	Teaching mode	Contact hours/student workload hours
1	Lecture	30/30
2	Classes	30/45
3	Laboratory	30/60
4	Project	0/0
5	BA/MA seminar	0/0
6	Other	0/0
	Total number of hours	90/135

24. Total hours: 225

25. Number of ECTS credits: 9

26. Number of ECTS credits allocated for contact hours: 4

27. Number of ECTS credits allocated for in-practice hours (laboratory, classes, projects): 3

26. Comments:

Approved:

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(date, instructor's signature)

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(*date, the Director of the Faculty Unit signature)*