

# **MODULE DESCRIPTION**

Madula aada	full-time studies:	Z-ZIP1-E-105
	part-time studies:	Z-ZIPN1-E-105
Module name	Physics I	
Module name in Polish	Fizyka I	
Valid from academic year	2019/2020	

#### MODULE PLACEMENT IN THE SYLLABUS

Field of study	MANAGEMENT AND PRODUCTION ENGINEERING
Level of education	1st degree
Studies profile	General
Form and method of conducting classes	Full-time and Part-time
Specialisation	All
Unit conducting the module	Department of Mathematics and Physics
Module co-ordinator	Medard Makrenek, PhD, DSc
Approved by:	Dariusz Bojczuk, PhD, DSc

#### MODULE OVERVIEW

Type of subject / group of subjects	Basic
Module status	Compulsory
Language of conducting classes	English
Module placement in the syllabus - semester	Semester I
Initial requirements	No requirements
Examination (YES/NO)	NO
Number of ECTS credit points	2

Method of c	onducting classes	Lecture	Classes	Laborato- ry	Project	Other
Per	full-time studies:	15	15			
semester	part-time studies:	9	9			

# TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Category	Symbol	Learning outcomes	Assignations to the directional learning out- comes
Knowledge	W01	A student has knowledge of electric charge, charge con- servation principle, Coulomb law, electric and magnetic fields as well as knowledge about necessary mathemati- cal methods such as calculus and differential equations.	ZIP1_W02
	W02	A student has knowledge of electric circuits and Ohm law, magnetic properties of metals and understands meaning of their universality.	ZIP1_W02
	U01	U01 A student is able to analyse and describe basic physical phenomena.	
Skills	U02	A student is able to model basic physical phenomena.	ZIP1_U17
	U03 A student is able to compute and compare values of physical quantities of macroworld and microworld.		ZIP1_U19
Social competences	K01	A student understands the need of permanent follow-up of her/his knowledge of foundations of physics.	ZIP1_K01

#### **TEACHING CONTENTS**

Method of conducting classes	Teaching contents
Lecture	<ul> <li>Electric charge. Charge conservation principle. Coulomb law.</li> <li>Electric field. Electric field strength. Lines of force. The force acting on a point charge in an electric field.</li> <li>Electric field. Capacitor. Electric current. Strength of electric current. Conductors and isolators. Resistance. Ohm law.</li> <li>Magnetic field and generation of magnetic field. The force acting on a charge moving in magnetic field. Action of a magnetic field on a current carrying conductor. Units of magnetic field. The Biot-Savart law.</li> <li>Magnetic properties of materials. Electromagnetic field.</li> <li>Wave motion. Sinusoidal waves. Electromagnetic waves.</li> <li>Lght as electromagnetic field. Basic properties of the light.</li> </ul>
Classes	Coulomb law. Electric field. Electric current. Conductors and isolators. Ohm law. The Biot-Savart law. Electromagnetic field. Wave motion and electromagnetic field.

### METODS OF ASSESSING TEACHING RESULTS

Symbol	Methods of checking the learning outcomes (select X)								
	Oral exam	Written exam	Test	Project	Statement	Other			
W01			Х						
W02			Х						
U01			Х			Х			
U02			Х			Х			
U03			Х			Х			
K01			Х			Х			

#### FORM AND CONDITIONS OF PASSING

Form of classes	Form of credit	Passing conditions
Lecture	Credit with grade	Obtaining at least 50% of test points during the class
Classes	Credit with grade	Obtaining at least 50% of test points during the class

#### STUDENT WORKLOAD

Balance of ECTS points												
No	Time of studentile setticity		Student's workload									
INO.	Type of student's activity	full-time					part-time					Unit
4			С	Lb	Ρ	0	Lc	С	Lb	Ρ	0	h
1.	Participation in the activities	15	15				9	9				n
2.	Other (consultation, exam)	2	2				2	2				h
3.	Number of hours of a student's as- sisted work		34					22				
4.	Number of ECTS credit points which are allocated for assisted work		1,4					0,9				
5.	Number of hours of a student's un- assisted work		16				28					h
6.	Number of ECTS credit points which a student receives for unassisted work		0,6					1,1				ECTS
7.	Work input connected with practical classes		25				25					h
8.	Number of ECTS credit points which a student receives for practical classes	1,0					1,0					ECTS
9.	Total number of hours of a stu- dent's work	50 50							h			
10.	Punkty ECTS za moduł 1 ECTS=25 hours	2								ECTS		

## LITERATURE

- 1. Brown R.G. (2013), Introductory Physics I Elemenytary Mechanics, Durham USA.
- 2. Tripler P.A., Llewellyn R.A. (2008), *Modern physics*, W. H. Freman and Company, New York USA (https://web.pdx.edu/~pmoeck/books/Tipler\_Llewellyn.pdf)
- Physics High school (2020), OpenStax Rice University, Houston USA (https://d3bxy9euw4e147.cloudfront.net/oscms-prodcms/media/documents/Physics-WEB\_Sab7RrQ.pdf)