

SYLLABUS¹

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty ² / Department ³	Faculty of Electronics and Telecommunications/Fundamentals of Physics for Engineers
1.3 Chair	—
1.4 Field of study (name/code ⁴)	
1.5 Study cycle	
1.6 Study program (name/code)/Qualification	

2. Information about the discipline

2.1 Name of discipline	PHYSICS						
2.2 Coordinator (holder) of course activities	Blaj Constantin						
2.3 Coordinator (holder) of applied activities ⁵	Delia Calinoiu						
2.4 Year of study ⁶	1	2.5 Semester	2	2.6 Type of evaluation	E	2.7 Type of discipline	Mandatory

3. Total estimated time (hours / semester of didactic activities)

3.1 No. of hrs. / week	5 , of which:	3.2 course	3	3.3 seminar/laboratory/ project/training	2
3.4 Total no. of hrs. in the education curricula	70 , of which:	3.5 course	42	3.6 applied activities	28
3.7 Distribution of time for individual activities related to the discipline					hrs.
Study using a manual, course materials, bibliography and lecture notes					14
Additional documentation in the library, on specialized electronic platforms and on the field					4
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays					12
Tutoring					7
Examinations					6
Other activities					
Total hrs. of individual activities					43
3.8 Total hrs. / semester ⁷	113				
3.9 No. of credits	5				

4. Prerequisites (where applicable)

4.1 Curriculum	<ul style="list-style-type: none"> Vector algebra and vector analysis, Basic computer user
4.2 Competencies	<ul style="list-style-type: none"> Mathematics skills, computer basic knowledge

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> Big (enough) room, with both projector and white (or black) board
5.2 to conduct practical activities	<ul style="list-style-type: none"> Lab with devices for experiments, 1 computer for one student, if the group is reasonable

¹ The form corresponds to the Syllabus promoted by OMECTS 5703/18.12.2011 (Annex3).

² The name of the faculty which manages the educational curriculum to which the discipline belongs.

³ The name of the department entrusted with the discipline, and to which the course coordinator / holder belongs.

⁴ Fill in the code provided in GD no. 493/17.07.2013.

⁵ The applied activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).

⁶ The year of study to which the discipline is provided in the curriculum.

⁷ It is obtained by summing up the number of hrs. from 3.4 and 3.7.

6. Specific competencies acquired

Professional competencies ⁸	<ul style="list-style-type: none"> Analiza metodică a problemelor întâlnite în activitate, identificând elementele pentru care există soluții consacrate, asigurând astfel îndeplinirea sarcinilor profesionale
Transversal competencies	<ul style="list-style-type: none"> Analiza metodică a problemelor întâlnite în activitate, identificând elementele pentru care există soluții consacrate, asigurând astfel îndeplinirea sarcinilor profesionale

7. Objectives of the discipline (based on the grid of specific competencies acquired)

7.1 General objective of the discipline	<ul style="list-style-type: none"> Understanding of concepts, theory and basic methods in the study of physics; Using the principles and basic methods in solving problems
7.2 Specific objectives	<ul style="list-style-type: none"> Same as 7.1

8. Content

8.1 Course	No. of hours	Teaching methods
Units, Physical quantities, Scalars and Vectors, MKSA and other units system	2	Interactive slide presentation, sustained by demonstrations and problem solving, in „classical” manner
Classical Mechanics 1 Newton's Laws, 2 Work, Kinetic Energy, Potential Energy, Energy Conservation, 3 Momentum, Impulse and Collisions	6	idem
Oscillations 1 Simple Harmonic Motion 2 Damped and Forced Oscillations 3 Resonance	6	idem
Waves 1 Waves Equations, Superposition and Standing waves 2 Interference, Diffraction, Polarization, Reflection and Refraction 3 Sound waves. Doppler Effect	8	idem
Electromagnetic Waves 1 Electric Flux, Magnetic Flux, Electromagnetic Induction (Faraday's Law), Magnetic Circuit (Ampere's Circuital Law) 2 Maxwell's Equations 3 Nature and Propagation of Light.	6	idem
Thermodynamics 1 Temperature and Heat 2 Thermal properties of Matter, 3 Ideal Gas Law and Simple Transforms, 4 The First Law of Thermodynamics 5 The Second Law of Thermodynamics	6	idem

⁸ The professional competencies and the transversal competencies will be treated according to the Methodology of OMECTS 5703/18.12.2011. The competencies listed in the National Register of Qualifications in Higher Education [Registrul Național al Calificărilor din Învățământul Superior RNCIS] (http://www.rncis.ro/portal/page?_pageid=117,70218&_dad=portal&_schema=PORTAL) will be used for the field of study from 1.4 and the program of study from 1.6 of this form, involving the discipline.

6 The Third Law of Thermodynamics 7 Thermodynamic Cycles		
Modern Physics 1 Elements of Einstein's Relativity Theory 2 Photoelectric Effect, Compton Effect, Uncertainty Principle (Heisenberg) 3 Particles behaving as Waves 4 Laser; Electronic Microscope; Nuclear Magnetic Resonance Imaging(NMRI)	4	idem
Structure of Solids (Condensed Matter) 1 Energy Bands 2 Free Electron Model of Metals 3 Semiconductors 4 Superconductivity	4	idem
Bibliography ⁹ 1. Sears and Zemansky's, <i>University Physics</i> , 12 th edition, 2008, Pearson Education 2. Sears, Zemansky and Young, <i>Fizică</i> (în Romanian), Editura Didactică și Pedagogică, București, 1983 (in UPT' Library) 3. Paul A.Tipler, Gene Mosca, <i>PHYSICS – For Scientists and Engineers</i> , Freeman & Company, New York, 2008 (in UPT Library) 4. C.Blaț , <i>Chapters of Physics for Engineers; Classical Mechanics-Abstracts & Problems</i> , http://et.upt.ro/etf/index.php?link=2&sublink=1700&pag=1&lang=ro		
8.2 Applied activities¹⁰	No. of hours	Teaching methods
Seminar	14	Models of solved problems
The seminar follows the course presentation	7 times x 2h	Proposed and homework problems revision, 3 short written verifications
Laboratory	14	All the labworks are mandatory.
Introduction, general presentation and Experimentarium essay distribution (choice), measurement principles, errors		Each lab work is evaluated
Experimentarium – experiments and explanations		Final discussion
Seebeck Effect		revision of the results
Photovoltaic effect		the presentation of the Experiment
Speed distribution of thermoelectrons		Are the basis for the
Principle of a semiconductor diode; characteristics		Final mark
Bibliography ¹¹ The same as for the course + http://et.upt.ro/etf/index.php?link=2&sublink=24&lang=ro (Cadre Didactice & Experimentarium TM)		

⁹ At least one title must belong to the department staff teaching the discipline, and at least 3 titles must refer to national and international works relevant for the discipline, and which can be found in the Politehnica University Library.

¹⁰ The types of applied activities are those specified in footnote 5. If the discipline contains several types of applied activities, then these will be written consecutively in the lines of the table below. The type of activity will be written in a distinct line, as „Seminar:”, „Laboratory:”, „Project:” and/or „Practice/Training:”.

¹¹ At least one title must belong to the staff teaching the discipline.

9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

- Engineering can be considered as applied Physics and the understanding of the laws and principles of surrounding nature is the fundamental knowledge for engineering design

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Understanding of the concepts	The verification is done by exam, based on three hour written verification , 9 questions (6 of them being problems).	2/3
10.5 Applied activities	S: Solving problems , discussions, argumentation and interpretation of the results	A mark, from 1.1 to 10 (with one decimal digit) is obtained as global apreciation of the seminar activity.	1/6
	L: Experiments and calculations; file with the results	A mark from 1.1 to 10 is given for the laboratory activity, based on the abilities, both practic and theoretic. The essay based on Experimentarium activity is an important part of the laboratory final mark.	1/6
	P:		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified)			
<ul style="list-style-type: none"> • Ability of giving correct answers to (at least) simple problems and the capacity to express in words and the math relation the main laws. Ability in describing an experiment. This is done by requiring minimum 5.0 for all the marks involved in the average, final, mark. 			

Date of completion

02.02.2015

**Course coordinator
(signature)**

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**Coordinator of applied activities
(signature)**

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**Head of Department
(signature)**

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**Date of approval in the Faculty
Council¹²**

**Dean
(signature)**

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¹² Avizarea este precedată de discutarea punctului de vedere al board-ului de care aparține programul de studiu cu privire la fișa disciplinei.