SYLLABUS [1]

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty[2]/ Department [3]	Faculty of Civil Engineering/Fundamentals of Physics for Engineers
1.3 Chair	—
1.4 Field of study (name/code[4])	Civil Engineering/80
1.5 Study cycle	bachelor
1.6 Study program (name/code/qualification)	Civil Engineering in English/10/Engineer

2. Information about the discipline

2.1 Name of discipline/ formative category[5]			Physics 2 Fundamentals of Electrical Engineering / DF				
2.2 Coordinator (holder) of course activities			Conf. dr. ing. Marian GRECONICI				
2.3 Coordinator (holder) of applied activities[6]			Conf. dr. ing. Marian GRECONICI				
2.4 Year of study[7]	2	**2.5** Semester	3	**2.6** Type of evaluation	D	**2.7** Type of discipline[8]	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) [9]

3.1 Number of fully assisted hours / week	3 of which:	**3.2** course	2	**3.3** seminar / laboratory / project	1
3.1* Total number of fully assisted hours / semester	42 of which:	**3.2*** course	28	**3.3*** seminar / laboratory / project	14
3.4 Number of hours partially assisted / week	of which:	**3.5** training		**3.6** hours for diploma project elaboration	
3.4* Total number of hours partially assisted / semester	of which:	**3.5*** training		**3.6*** hours for diploma project elaboration	
3.7 Number of hours of unassisted activities / week	2 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0.5
		hours of individual study after manual, course support, bibliography and notes			1
		training seminars / laboratories, homework and papers, portfolios and essays			0.5
3.7* Number of hours of unassisted activities / semester	28 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			7
		hours of individual study after manual, course support, bibliography and notes			14
		training seminars / laboratories, homework and papers, portfolios and essays			7
3.8 Total hours / week [10]	5				
3.8* Total hours /semester	70				
3.9 Number of credits	3				

[1] The form corresponds to the Discipline File promoted by OMECTS 5703 / 18.12.2011 and to the requirements of the ARACIS Specific Standards valid from 01.10.2017.
[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] The code provided in HG no.140 / 16.03.2017 or similar HGs updated annually shall be entered.
[5] Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).
[6] Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).
[7] Year of studies in which the discipline is provided in the curriculum.
[8] Discipline may have one of the following regimes: imposed discipline (DI), optional discipline (DO) or optional discipline (Df).
[9] The number of hours in the headings 3.1 *, 3.2 *, ..., 3.8 * is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≥ 28 hours / wk. and (3.8) ≤ 40 hours / wk.
[10] The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

4. Prerequisites (where applicable)

4.1 Curriculum	• Vector algebra and vector analysis, Basic computer user, Physics
4.2 Competencies	• Mathematics skills, computer basic knowledge ,Physics principles

5. Conditions (where applicable)

5.1 of the course	• Big (enough) room, with both projector and white (or black) board
5.2 to conduct practical activities	• Seminar room

6. Specific competencies acquired through this discipline

Specific competencies	• Acquire knowledge about electromagnetic phenomena and methods for solving problems in the domain of electromagnetics.
Professional competencies ascribed to the specific competencies	• Design of structural elements in civil engineering, specific to graduated study programme • Complying to quality and sustainable requirements for civil, industrial and agricultural constructions
Transversal competencies ascribed to the specific competencies	• Documentation in Romanian and foreign language, in view of professional and personal development, via continuous learning and efficient adaptation to the new technical specifications

7. Objectives of the discipline (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	• Presentation of the fundamental scientific principles from the field of electric and electronic engineering, based on the laws of electromagnetics according to Maxwell-Hertz theory
7.2 Specific objectives	• The development of skills and aptitudes of the students in order to have a correct understanding of electromagnetic phenomena and ability to handle some methods for solving problems in the domain of electromagnetics. An engineering approach of problems and the development of the capacity for measurements and results interpretation

8. Content [11]

8.1 Course	Number of hours	Teaching methods [12]
1. Electrostatic Field. Coulomb's Law and Electric Field Intensity; Electric Flux Density and Gauss's Law ; Nature of Dielectric Materials ; Capacitance	2	Mix of slide show and

[11] It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".
[12] Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

2. Energy and Electric Potential Energy of an Electrostatic System; Potential Difference and Electric Potential Field; Current and Current Density ;Resistors; Joule's Law;.	4	classic presentation; Questions for a test of understanding
3. Conductors; Metallic Conductors; Conductor Properties in Electrostatic Field; Semiconductors; Superconductors	2	
4.The Steady Magnetic Field Magnetization and Permeability;Magnetic Circuits; Inductances	2	
5.Time-Varying Fields, AC circuits	3	
6.Rectifiers. Ac / DC conversion	1	
Bibliography [13] 1. W.H.Hayt,J.A.Buck,*Engineering Electromagnetics*,McGraw-Hill,2001 2. D.D.Irimia,C.Blaj,*Campuri si unde electromagnetice*,Editura Politehnica,Timisoara,2014 3. D.D.Irimia,C.Blaj, *Circuite electrice,* Editura Politehnica, Timisoara, 2013		

8.2 Applied activities [14]	Number of hours	Teaching methods
SEMINAR Electric Flux and Gauss's Law; Capacitance and Resistors; Calculation of Electric dc circuits; Faraday's Law; Magnetic Circuits	7	About 30 proposed problems (in advance, by intranet). Solving 3-4 problems per seminar
Bibliography [15] The same as for course		

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

- Updating the course each year. Basic understanding of Maxwell's Hertz theory assures a long time capability of adaptation to the newest technological discoveries. Main knowledge of Electromagnetics principles is indispensables for all engineering activity, using electric and magnetic instruments, tools and devices

10. Evaluation

Type of activity	**10.1** Evaluation criteria [16]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	9 questions; 3 short theory,	Written examination	66%

[13] At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.
[14] Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".
[15] At least one title must belong to the discipline team.
[16] Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

	6 problems, with gradual dificulty		
10.5 Applied activities	**S:** Capability of solving problems	1 test	33%
	L:		
	P[17]**:**		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [18])			
• Both, theory and problems should be solved at least 50%			

Date of completion 02.02.2018	**Course coordinator (signature)** ……	**Coordinator of applied activities (signature)** ……
Head of Department (signature) ……	**Date of approval in the Faculty Council** [19] 12.02.2018	**Dean (signature)** ……

[17] In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.
[18] It will not explain how the promotion mark is awarded.
[19] The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.