

COURSE SYLLABUS

University	Alexandru Ioan Cuza University of Iași	Course title	
Faculty	Physics	Electronic Circuit Simulation	
Department	Physics		
Domain	Modeling and simulation	Course category (FC/SC/CC¹): FC	Term (1-4): 3
Level	Postgraduate (MA)	Course type (Co/EI/F²):CO	

I. Course structure

Number of hours/week				Credits	Total class hours/semester	Total hours of individual activity	Examination type (C/Ex/CE ³)	Teaching language
Course	Seminar	Lab.	Project	6	56	124	Ex	English
2	-	2	-					

II. Instructors

	Academic degree ⁴	Scientific degree	Name and surname	Faculty position (tenure/associate - organization)
Course	Lecturer	PhD	Paul GASNER	tenure
Seminar				
Laboratory	Lecturer	PhD	Paul GASNER	tenure

III. Prerequisites

Electricity and magnetism. Electrodynamics. Electronic devices and circuits

IV. Course objectives

1. Knowledge of modeling and simulation of electronic circuit and devices for low and high frequencies;
2. Ability to apply knowledge of electromagnetism in practical situations
3. Ability to search and analyze information from different bibliographic sources
4. Ability to work in a team to solve different technological and experimental challenges
5. Ability to initiate and manage personal and team projects

V. Course content

Course	<p><u>CHAPTER 1: Introduction, History</u></p> <p><u>CHAPTER 2 Diport parameters</u></p> <p><u>CHAPTER 3 Electromagnetic propagation</u></p> <p>§1. Propagation equations for various media, free space and guided;</p> <p>§2. Planar circuits</p> <p><u>CHAPTER 4: Models and methods</u></p> <p>§1. Momentum methods;</p> <p>§2. Finite element and finite differences in frequency and time domains;</p> <p>§3. EFIE and MFIE;</p> <p>§4. TLM formalism;</p> <p>§5. WCIP method;</p> <p>§6. Software presentation (ORCAD, SPICE, CADANCE, APLAC, SONET, NEC, HFSS);</p> <p>§7. Optimization methods.</p>
Seminar	
Laboratory	Software presentation (ORCAD, SPICE, CADANCE, APLAC, SONET, NEC, HFSS). Project works on SONET, ORCAD-like, NEC, APLAC. Optimization.

VI. Minimal required references

¹ FC – fundamental course, SC – specialty course, CC – complementary course

² Co – compulsory, EI – elective, F – facultative

³ C – colloquium, Ex – exam, CE – colloquium AND exam

⁴ Professor / Associate professor / Lecturer / Assistant professor / Teaching assistant

[1] D.D. Sandu, „Microunde”, Ed. Victor, București, 2005
 [2] G. Rulea, “Tehnica microundelor”, EDP, 1981
 [3] 4. D. D. Sandu, “Dispozitive electronice pentru microunde”, Ed. Șt. și Encicl., 1982
 [4] 5. D. D. Sandu, “Electronică fizică și aplicată”, Edit. Universității “Al.I.Cuza” Iași, 1994
 [5] 6. A. Harvey, “Microwave Engineering”, Academic Press, 1963
 [6] 9. I. Casian-Botez, „Teoria și proiectarea circuitelor de microunde”, Matrix Rom, București, 1998
 [7] 10.K. G. Gupta, A. Benalla, “Microstrip antenna design”, Artech House, 1988
 [8] 11.Documentație utilitare APLAC, SONET, NEC
 [9] 12.IEEE – MTT și AP
 [10] 13.<http://home.uaic.ro/~gasner/>

VII. Didactic methods

Lectures, problems solving, discussions, didactic films

VIII. Assessment

Pre-conditions	Attendance (30% from the final grade), active participation to class activities	
Exam dates	1st Assessment	Week 8
	2nd Assessment	Week 16

	Assessment means and methods	Percentage of the final grade
Exam/Colloquium	Written paper	50%
Seminar		
Laboratory	Problems solving, presentation of a research topic and work reports	50%