SYLLABUS

General	Title and code of subject,	ETR 605 Simulation of electronic devic	es and circuits 8 ECTS	
mormation	number of creats	Physics and Electronics		
	Department	Master		
	r logram			
	Academic semester	2024 Fall PhD desent Haseney Flahin		
	E moile	FIID, dosent, Hasanov Elenni		
	E-man;	eigaigas@yanoo.com		
	Phone number:	+994 50 5287740		
	Lecture room/Schedule	11 Mehseti Street, AZ1096 Baku, Azer	baijan (Neftchilar campus),	
		room		
	Consultations	II, 15:00 – 16:00		
	Office hours			
Prerequisites				
Course	English			
language				
subject	Major			
Textbooks and	1. G. Streetman, and S. K. Ban	erjee, "Solid State Electronic Devices," 7	th edition, Pearson,2014.	
additional	2. S. M. Sze and K. N. Kwok	, "Physics of Semiconductor Devices,"	3rd edition, John Wiley&Sons,	
materials	2006.			
	3. D Vasileska, SM. Goodnick	, G Klimeck, "Computational Electronic	cs: Semiclassical and Quantum	
	Device Modeling and Simulation	on," CRC Press 2010.		
The section of	4. Selberherr Siegfried, "Analy	sis and Simulation of Semiconductor Dev	/ices ^{**} , 1984	
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Aggagement	Group discussions at seminar	S Doto/Doodling	+ Democrat (0/)	
Assessment	Components	Date/ Deaume	rercent (76)	
	Tests (oral questioning)	During the semester	5	
	Tests (oral questioning)	During the semester	5	
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before midterm and final exams. Submission of the individual works by the end of course is obligatory.
• Effectiveness (pass/fail)
This course strictly follows the assessment policy conducted by the subject teaching faculty. Hencew a
student must score at least 60% to pass the course normally. In case of failure he will be forced to
repeate the course in the next term or year.
• Plagiarism
Cheating or other forms of plagiarism during review surveys, midterms and final exams will result in
disqualification. In this case a student will automatically receive zero "0" without furher discussion.
Professional conduct directives
Students will behave professionally during class hours to create a conductive academic environment.
Off course discussions and unethical behavior are strictly prohibited.
• Attendance
Participation of students at all classis is important. Students should inform dean's office about missing
lessons for particular reasons (illness, family issues and etc.). Students, missing more than 25% of
lessons, are not allowed to take the exam.
• Quizzes.
Quizzes will be four times during semester. The time of quizzes will be announced in the classrom
three weeks before. The quizzes will be related to the homework material.
• Activity
Students who will be active during discussion of past lessons will be awarded with one activity
mark.

This program reflects the comprehensive information about the subject and information about any changes will be provided in advance.

Week	Dates	Subject topics	Textbook/
	(planned)		Assignments
1	21/09/24	Physics-based and empirical compact modeling for circuit simulation.	[1] p.709-741
		Problem solving.	
2	28/09/24	Types of physics-based models	[1] p.750-773
			[1] p-780-795
		Problem solving.	
3	05/10/24	Types of empirical models	[1] p.800-815
		Problem solving.	
4	12/10/24	CAD model for SPICE	[1] p.815-838
		Criteria for a good SPICE model	
		Problem solving.	
5	19/10/24	Modeling and Simulation	
		Problem solving.	
6	26.10/24	Electrical Analysis	[1] p.846-872
		Current State of the Art and Requirements/Challenges	
		Problem solving.	
7	02/11./24	Modeling of novel transistors and emerging devices	[1]p.881-900,
		Problem solving	
8	09/11/24	Device simulation using semiclassical approach	[1] p.957-984
		Problem solving.	

9		Mid term exam	
10	16/11/24	Device simulation using quantum mechanical approach	[1] p.916-947
		Problem solving	
11	23/11/24	TCAD device simulation (technology computer-aided design)	[4]p. 73-96
		Problem solving	
12	30/11/24	Thermal and Thermomechanical Modeling	[1] p.1061-1085
		Problem solving	
13	07/12/24	Semiclassical Transport Theory	[3]p.555-611
		Mechanical and multi-physics	
		Problem solving.	
14	14/12/24	Drift-Diffusion (DD)	[1] page 9-6
		Problem solving	[1] page 10-6
15	21. 12/24	Nanoscale phenomena at the device level.	[1] page 11-6

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