OSTIM TECHNICAL UNIVERSITY
FACULTY OF ENGINEERING

COURSE SYLLABUS FORM
2022-2023

Course Name	Course Code	Period	Hour	Application Hour	Lab Hour	Credit	ECTS
Electronics-I	EEE301	Fall	3	0	2	4	5

Prerequisite	EEE201
Language of Instruction	English
Course Status	Obligatory
Course Level	Undergraduate
Method of Teaching	In class lectures
Learning and Teaching Techniques of the Course	Lectures, Homeworks, Projects, Lab

Course Objective

The course aims to improve students knowledge about conduction mechanism in metals and semiconductors, doping in semiconductors, PN junction, diode characteristics and applications, Bipolar Junction Transistor (BJT) operation modes, transistor characteristics, transistor bias, small signal modeling and analysis, JFET (Junction Field Effect Transistor) operations and bias, MOSFET (Metal Oxide Semiconductor Field Effect Transistor) operations and bias, FET (Field Effect Transistor) small signal modeling and analysis, thyristors, power supplies, related devices, and further discussions such as advance BJT-FET applications...

Learning Outcomes

Upon successful completion, students will have the knowledge and skills to:

1.	Learn about the atomic structure, metals and semiconductors, conduction			
2	Interpret the doping in semiconductors, PN junction, diode characteristics and app's			
3	Analyze the transistor (BJT) characteristics, operation modes and transistor bias			
4	Understand BJT small signal modeling and analysis			
5	Demonstrate understanding of FET characteristics, FET bias, small signal modeling and analysis.			

Course Outline

This course is an introduction to Electroincs/Analog Design with Diode/BJT as the primary focus. Topics include metals and semiconductors, PN junction, diode characteristics and applications, Bipolar Junction Transistor (BJT) operation modes, transistor characteristics, transistor bias, small signal modeling and analysis etc..

Weekly Topics and Releated Preparation Studies		
Weeks	**Topics**	**Preparation Studies**
1	Introduction - Semiconductors Basics	Chapter 1, Boylestad&Nashelsky,11thEd.
2	Atomic structure, metals and semiconductors, conduction	Chapter 1, Boylestad&Nashelsky,11thEd.
3	Atomic structure, metals and semiconductors, conduction	Chapter 1, Boylestad&Nashelsky,11thEd.
4	PN Junction - Diode	Chapter 2, Boylestad&Nashelsky,11thEd.
5	DIODE characteristics and applications	Chapter 2, Boylestad&Nashelsky,11thEd.
6	DIODE characteristics and applications	Chapter 2, Boylestad&Nashelsky,11thEd.
7	DIODE characteristics and applications	Chapter 2, Boylestad&Nashelsky,11thEd.
8	**Midterm Exam**	
9	BJT (Bipolar Junction Transistor; transistor characteristics; transistor bias;)	Chapter 3, Boylestad&Nashelsky,11thEd.
10	BJT (Bipolar Junction Transistor; transistor characteristics; transistor bias;)	Chapter 3, Boylestad&Nashelsky,11thEd.
11	BJT (Bipolar Junction Transistor; transistor characteristics; transistor bias;)	Chapter 3, Boylestad&Nashelsky,11thEd.
12	BJT (Bipolar Junction Transistor; small signal modeling and analysis)	Chapter 3, Boylestad&Nashelsky,11thEd.
13	BJT (Bipolar Junction Transistor; small signal modeling and analysis)	Chapter 3, Boylestad&Nashelsky,11thEd.
14	BJT (Bipolar Junction Transistor; small signal modeling and analysis)	Chapter 3, Boylestad&Nashelsky,11thEd.
15	FET (Field Effect Transistor; transistor characteristics; transistor bias; small signal modeling and analysis)	Chapter 4, Boylestad&Nashelsky,11thEd.
16	**Final Exam**	

Textbook(s)/References/Materials:
R.L.Boylestad, L.Nashelsky, “Electronic Devices&Circuit Theory”, 11th Ed., Pearson Educ., 2013.

Assessment		
Studies	**Number**	**Contribution margin (%)**
Active Participation		
Lab	8	15
Application		

Field Study		
Course-Specific Internship (if any)		
Quizzes / Studio / Critical	1	15
Homework		
Presentation		
Projects		
Report		
Seminar		
Midterm Exams / Midterm Jury	1	30
General Exam / Final Jury	1	40
	Total	
Success Grade Contribution of Semester Studies		60
Success Grade Contribution of End of Term		40
	Total	100

Course Category	
Basic Vocational Courses	X
Specialization/Field Courses	
Support Courses	
Communication and Management Skills Courses	
Transferable Skills Courses	

Relationship Between Course Learning Outcomes and Program Competencies							
No	**Learning Outcomes**	**Contribution Level**					
		1	**2**	**3**	**4**	**5**
1	Ability to apply knowledge of mathematics, science, and engineering				x	
2	Ability to design and conduct experiments and to analyze and interpret experimental results.					
3	Ability to design a system, component, and process according to specified requirements.				x	
4	Ability to work in teams in interdisciplinary areas.				x	
5	Ability to identify, formulate and solve engineering problems.				x	
6	Identifies, defines, formulates and solves complex network problems; chooses and applies analysis and modeling methods suitable for this purpose.					x
7	Develops, selects and uses modern techniques and tools necessary for the analysis and solution of complex problems encountered in Electrical and Electronics Engineering applications; uses required technologies effectively.					x

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Course hours (Including the exam week: 16 x total course hours)	14	3	42
Laboratory	14	2	28
Application	8	1	8
Course-Specific Internship			
Field Study			
Study Time Out of Class	14	2	28
Presentation / Seminar Preparation			
Projects			
Reports			

Homeworks			
Quizzes / Studio Review	2	3	6
Preparation Time for Midterm Exams / Midterm Jury	1	22	22
Preparation Period for the Final Exam / General Jury	1	22	22
Total Workload	**(156/30=5,2)**		**156**