

ELECTRICAL-ELECTRONICS ENGINEERING DEPARTMENT

ELECTRONIC CIRCUITS 2 LABORATORY BOOKLET

September 2022

Electronic Circuits 2 Course Description Form

Course		.			Credit	ГСТС	
Name	Code	Term	Ineory	Application	Credit	ECIS	
Electronics Laboratory 2	EEE301	5	0	2	1	3	
Prerequisite	None						
Course Duration	Starts: 26.09.2022 Ends: 30.12.2022						
Course Language	English						
Course Type	Compulsory						
Course Level	Undergraduate						
Instructors	Asst. Prof. Dr. Vedat TAVAS						
Contact	vtavas@iticu.edu.tr , 0 216 489 18 88 (Ext : 3343)						
Teaching Assistant	Aynur Tuba Çakmak, Fatih Kuru						
Objective of The Course	Analyze the frequency behavior, gain and stability of the circuits.						
Course Learning Outcomes (CLO)	 1) Knows frequency dependent behavior of circuits 2) Knows behaviors of op-amps 3) Knows multivibrators. 4) Knows oscillators. 5) Knows power amplifier aplications. 						
Teaching Methods	ds Face to face.						
Course Content (brief)	Frequency response of amplifiers, Filters and Peak Deterctor, Linear Applications of Op-Amp, Non- Linear Applications of Op-Amp, Analyzing Non-Ideal Characteristics of Op-Amp, Multivibrators, Wave generation with 555 / 2206, Operation Classes of Transistor, Oscillators				on- Wave		

WEEKLY COURSE OUTLINE

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1	Add-drop week
2	Introduction of Laboratory, Organizing experiment teams
3	Frequency response of amplifiers
4	Filters
5	Linear applications of opamps
6	Non-Linear applications of opamps
7	Non-ideal properties of opamps
8	Midterm Exam
8 9	Midterm Exam Multivibrators
8 9 10	Midterm Exam Multivibrators Wave generation with 555 / 2206
8 9 10 11	Midterm Exam Multivibrators Wave generation with 555 / 2206 Power amplifiers, amplifer classes
8 9 10 11 12	Midterm Exam Multivibrators Wave generation with 555 / 2206 Power amplifiers, amplifer classes Oscillators
8 9 10 11 12 13	Midterm Exam Multivibrators Wave generation with 555 / 2206 Power amplifiers, amplifer classes Oscillators Oscillators

Resources	Textbook	1. Booklet prepared by the instructor.
	Recommended Books	2. Synthesis of Electrical Networks, New York: J. Wiley, 1984
Teaching Equipment		Experiment sets. multimeters, oscilloscopes, electrical components.

Evaluation System

	Studies	Number	Contribution %
E	Homework	0	0
	Presentation	0	0
	Mid Term Exams	0	0
	Project	0	0
e ter	Laboratory	10	60
g the	Field Study	0	0
lurin	Quiz	0	0
ies d	Term Project	0	0
ctivit	Portfolio	0	0
Ă	Reports	0	0
	Learning Diaries	0	0
	Graduate Project	0	0
	Seminar	0	0
	Others	0	0
	Sub Total	10	60
	During Term Studies Contribution	-	60
	Final Exam Contribution (≥ 40%)	-	40
	TOTAL		100

COURSE AND PROGRAM LEARNING OUTCOMES RELATIONSHIP

No	Program Learning Outcomes (PLO), (Contribution Rate: 1 lowest, 5 highest)		Course Learning Outcomes (CLO)				
			2	3	4	5	
1	 Qualified knowledge of mathematics, science and electrical-electronics Engineering discipline; 	5	5	5	5	5	
	 ability to use theoretical and practical knowledge to model and solve complex electrical-electronics engineering problems. 	5	5	5	5	5	
2	 An ability to identify, formulate, and solve complex Electrical-Electronics engineering problems; 	5	5	5	5	5	
	 the ability to select and apply appropriate analysis and modeling methods for this purpose. 	5	5	5	5	5	
3	 An ability to design a complex system, process, device or product to meet specific requirements under realistic constraints and conditions; 						
	b. the ability to apply modern design methods for this purpose.						
4	 Ability to develop, select and use modern techniques and tools necessary for the analysis and solution of complex problems in electrical- electronics engineering applications; 						
	b. ability to use information technologies effectively.						
5	Ability to design, conduct experiments, collect data, analyze and interpret results to investigate electrical-electronics engineering problems.	5	5	5	5	5	
6	a. Ability to work effectively in disciplinary and multidisciplinary teams;						
	b. self-study skills.						
	a. Ability to communicate effectively in verbal and written Turkish;						
7	b. knowledge of at least one foreign language;						
,	c. ability to write effective reports and understand written reports, to prepare design and production reports, to make effective presentations, to give clear and understandable instructions and receiving skills.	5	5	5	5	5	
0	a. Awareness of the necessity of lifelong learning;						
8	 the ability to access information, follow developments in science and technology, and constantly renew oneself. 						
9	 To act in accordance with the ethical principles, professional and ethical responsibility awareness; 						
	 information about standards used in electrical-electronics engineering applications. 						
10	 a. Information on business practices such as project management, risk management and change management; 						
	b. awareness about entrepreneurship and innovation;						
	c. information on sustainable development.						
11	 Information about the effects of electrical-electronics engineering applications on health, environment and safety in universal and social dimensions and the problems reflected in the engineering field of the age; 						
	b. awareness of the legal consequences of engineering solutions.						

ECTS-WORK	LOAD	TABLE
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Activities	Week	Time (Hour)	Total Work Load
Course Duration	0	0	0
Out of Classroom Studies Duration	10	1	10
Homework	0	0	0
Presentation	0	0	0
Midterm Exam	0	0	0
Project	0	0	0
Laboratory	10	2	20
Field Study	0	0	0
Final Exam	1	10	10
Quiz	0	0	0
Term Project	0	0	0
Portfolio Study	0	0	0
Report	10	3	30
Learning Diaries	0	0	0
Graduation Project	0	0	0
Seminar	0	0	0
Other	0	0	0
Total Work Load			75
Total Work Load / 25			2.8
ECTS			3

GENERAL RULES FOR LABORATORY

1- Attendance to laboratory is 80%.

EVALUATION

- 1- There will be 10 laboratory session during the semester.
- 2- Total contribution of the experiments conducted during the semester is %70.
- 3- Each of the experiment is evalueated as:
 - i. Individual performance during the session ->70 %
 - ii. Report submitted for that experiment -> 30 %
- 4- Final exam will be carried out as by each student individually at the final exam week.
- 5- Normally each of the experiment will be done individually. If an experiment conducted by a group, each member is responsible for taking notes individually during the experiment.
- 6- Results of an experiment will be announced on the web site two (2) weeks after the report submission.
- 7- Each student should submit a report for the experiment held in that week. Any group report is accepted.
- 8- Reports should be given to teaching assistant at the beginning of the lab session in the following week.
- 9- Experiment reports must carry the below properties.
 - i. A report for experiment is a technical document delivered together with the hard copy of notes taken during the session.
 - ii. It must be a computer output. Handwritings is not accepted.
 - iii. All the figures and tables must be redrawn by computer program.
 - iv. Reports should <u>not</u> exceed one page and it should include comments on results. Both sides of the page can be used.
 - v. Information provided in the report should be easily understandable and should be conveyed in the most explicit way.
 - vi. **Preparation information,** <u>figures provided in the experiment leaflets should not</u> <u>be repeated in the report</u>. For instance, representation of circuit connection figures is not required in the report. When necessary they can be referred according to their figure numbers given in the leaflets. Reports should contain related graphs, technical remarks and a separate section for results.

STUDY FOR EXPERIMENT:

A students's performance during an experiment is graded according to factors listed below:

Preliminary study for the session

Working and behavior during the experiment

Evaluation of the results

<u>1. Preliminary Study:</u>

Every student present during the lab session will be held to an enquiry by the lecturer related to the preliminary study which the students should have done before coming to the lab. This quiz may be verbal or written. At this point a student is expected:

-to know the theoretical information related to the experiment of the week. Knowledge about the related experiment can be retrieved from experiment leaflets and other related sources.

-to know the goal of the experiment, the way the measurements should be held and the reasons behind these measurements.

Effect of this section to the whole grading is 20%.

2. Experimentation:

<u>Each</u> student within the group should fully participate to the experiment. The constraints considered during grading are listed below:

- Approach to the problem
- Accuracy of the results obtained
- Success at evaluating and questioning the results (realizing unrealistic results and commenting on their possible reasons)
- Tool and device usage (ability to use the right tools at the right time and order)
- Ability to cope up with the problems
- Effective usage of time during the sessions
- Attention paid to the experiments

 \underline{Each} student in the groups will be evaluated individually, one by one for all above mentioned items.

Effect of this section to the whole grading is 30%.

3. Evaluation of the Results:

Results should be overviewed at the end of each measurement step. The constraints that need to be especially satisfied are:

- Evaluation of results obtained (meaning of the measured values, what can be obtained from these outcomes)
- Comparison of theoretical and experimental results when necessary

Effect of this section to the whole grading is 20%.

Reports:

Reports will be graded according to the document format, technical information given and results.

1. Format:

The report will be graded according to the related information it contains, readability and understandability of the information and figures provided. (Pencil should not be used.)

Effect of this section to the whole grading is 5%.

<u>2. Technical Information:</u>

All items expected from an experiment report, especially comments on the measurement results will be analyzed during grading.

Effect of this section to the whole grading is 10%.

3. Results:

Comments on course of experiment, the parts that need to be mentioned especially should be written in results section.

Effect of this section to the whole grading is 15%.