AGU Graduate School of Engineering and Science Electrical and Computer Engineering Program

COURSE RECORD

Code	**ECE 507**
Name	**Computer Applications in Electrical Engineering**
Hour per week	3+0 (Theory + Practice)
Credit	3
ECTS	7.5
Level/Year	Undergraduate and Graduate
Semester	Fall and Spring
Type	Elective
Location	-
Prerequisites	-
Special Conditions	-
Coordinator(s)	Dr. Burak Tekgün
Webpage	-
Content	Introduction to MATLAB&Simulink, system modeling and simulation, Models for common engineering solutions and dynamic analysis, using MATLAB-Simulink-Simpower in electrical engineering, modelling, simulating and analysis of electrical power systems, using MATLAB-Simulink-Control system tools in electrical engineering applications, curve fitting, etc. applications in electrical engineering.
Objectives	- Building solutions in electrical engineering applications with Matlab and Matlab&Simulink - Being familiar with MATLAB & Simulink, - Developing solutions for common engineering problems with computer analyzes and in engineering education - Usage of virtual labs
Learning Outcomes	LO1 The student will be able to approach any engineering problem in software platforms LO2 The student will be able to solve an engineering problem on a computer LO3 The student will be able to develop modelling capabilities. LO4 The student will be able to design controllers for the systems that s/he can model.
Requirements	
Reading List	Perelmuter, Viktor Renewable Energy Systems Simulation with Simulink and SimPowerSystems Matlab Help Documents, Mathworks
Ethical Rules and Course Policy	All students should comply with the Honor Code. The highest standards of academic honesty will be applied in this class. Cheating and plagiarism will be dealt severely.

LEARNING ACTIVITIES

Activities	**Number**	**Weight (%)**
Lecture	12	45%
Group Works	12	45%
Presentations	2	10%
	Total	100

ASSESSMENT

Evaluation Criteria	**Weight** (%)
Quizzes	10%
Weekly Assignments	20%
Project Assignments & Presentations	15%
Midterm Exam	20%
Attendance/Participation	05%
Final Exam/Submission	30%

Total	100%

For a detailed description of grading policy and scale, please refer to the website https://goo.gl/HbPM2y section 28.

COURSE LOAD

Activity	**Duration** (hour)	**Quantity**	**Work Load** (hour)
In class activities	3	12	36
Group work	3	10	30
Research (web, library)	4	12	48
Required Readings	3	12	36
Pre-work for Presentation	4	10	40
		General Sum	**190**

ECTS: 7.5 (Work Load/25-30)

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6
LO1	5	2	4	2	1	1
LO2	5	5	4	3	1	4
LO3	5	5	4	3	2	4
LO4	5	5	5	5	2	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

WEEKLY SCHEDULE

W	**Topic**	**Outcomes**
1	Introduction to Matlab & Simulink	LO1
2	Using Simulink for modelling and simulation	LO1
3	Using Simulink for modelling and simulation and applications (DC machine, transformer, induction machine, etc. models)	LO1, LO2
4	Models for common engineering solutions and dynamic analysis (determining system transfer functions)	LO1, LO2
5	Models for common engineering solutions and dynamic analysis (determining system frequency responses and Bode diagrams)	LO1, LO2
6	Using MATLAB/Simulink/Simpower for electric engineering applications	LO1, LO2, LO3
7	Using MATLAB/Simulink/Simpower for electric engineering applications and examples (open loop single phase inverter example)	LO1, LO2, LO3
8	Midterm exam	LO1, LO2, LO3
9	Modelling, simulating and analyzing Electric power systems	LO2, LO3
10	Modelling, simulating and analyzing Electric power systems and applications	LO2, LO3
11	Using MATLAB/Simulink/Control tools for electrical engineering applications and examples (Battery and solar PV system simulations)	LO2, LO3, LO4
12	Using MATLAB/Simulink/Control tools for electrical engineering applications and examples (Wind turbine simulations)	LO2, LO3, LO4
13	Project Presentations	LO2, LO3, LO4
14	Final exam	LO2, LO3, LO4

Dr. Burak Tekgün
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