

**ABDULLAH GÜL UNIVERSITY
GRADUATE SCHOOL OF ENGINEERING & SCIENCE
ELECTRICAL AND COMPUTER ENGINEERING PROGRAM
COURSE DESCRIPTION AND SYLLABUS**

Course Title	Code	Semester	T+L Hours	Credit	ECTS
FLAT PANEL DISPLAY TECHNOLOGIES	ECE-520	FALL-SPRING	3 + 0	3	10

Prerequisite Courses General Semiconductor Physics and Electronics Engineering Background

Type	Selective
Language	English
Coordinator	Assist. Prof. Evren Mutlugun
Instructor	Assist. Prof. Evren Mutlugun
Adjunt	none
Aim	<ul style="list-style-type: none"> - Learn the basics of the color science - Get acquainted with the display technologies - Learn the operating principles of different display technologies
Learning Outcomes	<ul style="list-style-type: none"> • Understanding the color perception and color science • Discussing the photo physical mechanisms involved in display technologies • Learning the operating principles of the different display technologies
Course Content	<ul style="list-style-type: none"> • Color science and physical mechanisms in optoelectronics • Working principles of different display technologies (liquid crystal displays, inorganic/organic light emitting diodes, plasma display technologies, field emission displays, electroluminescent displays)

WEEKLY TOPICS AND PRELIMINARY STUDY

Week	Topic	Preliminary Study
1	Displays overview	The relevant articles from the literature
2	Color science and engineering	The relevant articles from the literature
3	Photo-physical mechanisms	The relevant articles from the literature
4	Photo-physical mechanisms	The relevant articles from the literature
5	Liquid crystal displays	The relevant articles from the literature
6	Liquid crystal displays	The relevant articles from the literature
7	Inorganic light emitting diodes	The relevant articles from the literature
8	Inorganic light emitting diodes	The relevant articles from the literature
9	Midterm Exam	
10	Organic light emitting diodes and displays	The relevant articles from the literature
11	Organic light emitting diodes and displays	The relevant articles from the literature
12	Plasma displays	The relevant articles from the literature
13	Field emission displays	The relevant articles from the literature
14	Electroluminescent displays	The relevant articles from the literature
15	Future of the display technologies	The relevant articles from the literature
16	Final Exam	

SOURCES	
Lecture Notes	Lecture slides
Other Sources	<p>Course Textbook: Jiun-Haw Lee, D. N. Liu, S.-T. Wu, "Introduction to Flat Panel Displays", WILEY</p> <p>Additional Materials:</p> <ol style="list-style-type: none"> 1. Semiconductor Devices: Physics and Technology, Sze, 3rd Edition, WILEY 2. Color Science: Concepts and Methods, Quantitative Data and Formulae, Günther Wyszecki, WILEY

COURSE MATERIALS SHARING	
Documents	Lecture notes, slides
Homeworks	Students will be given one homework bi-weekly
Exams	1 Midterm and 1 Final Exam

EVALUATION SYSTEM		
SEMESTER STUDY	NUMBER	CONTRIBUTION
Midterm	1	20
Homework	7	35
Quiz	7	15
SUB-TOTAL		70
Contribution of Semester Study		70
Contribution of Final Exam	1	30
TOTAL		100

Course Category	
Sciences and Mathematics	60%
Engineering	40%
Social Sciences	0%

RELATIONSHIPS BETWEEN LEARNING OUTCOMES AND PROGRAM QUALIFICATIONS						
No	Program Qualifications	Contribution Level				
		1	2	3	4	5
1	Accessing knowledge, evaluating and interpreting information by doing scientific research in the field of Electrical and Computer Engineering					X
2	Ability to use science and engineering knowledge for development of new methods in Electrical and Computer Engineering					X
3	To be able to understand and analyze materials by using basic knowledge on Electrical and Computer Engineering					X
4	Design and implement analytical, modeling and experimental research					X
5	Solve and interpret the problems encountered in experimental research					X
6	Considering scientific and ethical values during the collection and interpretation of data			X		
7	Integrating knowledge of different disciplines with the help of scientific methods, and completion and implementation of scientific knowledge using data					X
8	To gain leadership ability and responsibility in disciplinary and interdisciplinary team works				X	
9	To be able to contribute to the solution of social, scientific and ethical problems encountered in the field of Electrical and Computer Engineering				X	
10	To be able to define, interpret and create new information about the interactions between various discipline of Electrical and Computer Engineering					X

*Increasing from 1 to 5.

ECTS / WORK LOAD TABLE			
Activities	Number	Duration (Hours)	Total Work Load
Course Length (includes exam weeks: 16x total course hours)	16	3	48
Out-of-class Study Time (Pre-study, practice)	16	4	64
Internet search, library work, literature search	16	4	64
Presentation	7	3	21
Homework	16	4	64
Midterm	1	20	20
Final Exam	1	25	25
Total Work Load			306
Total Work Load / 30			306/30
Course ECTS Credit			10