



ÇANKAYA UNIVERSITY

Faculty of Engineering

Course Definition Form

This form should be used for either an elective or a compulsory course being proposed and curricula development processes for an undergraduate curriculum at Çankaya University, Faculty of Engineering. Please fill in the form completely and submit the printed copy containing the approval of the Department Chair to the Dean's Office, and mail its electronic copy to deryac@cankaya.edu.tr. Upon the receipt of *both copies*, the printed copy will be forwarded to the Faculty Academic Board for approval. Incomplete forms will be returned to the Department. The approved form is finally sent to the President's office for approval by the Senate.

Part I. Basic Course Information

Department Name	Electrical-Electronics Engineering				Dept. Numeric Code	1	5				
Course Code	E	E	4	5	4	Number of Weekly Lecture Hours	3	Number of Weekly Lab/Tutorial Hours	0	Number of Credit Hours	3
Course Web Site	http:// ee454.cankaya.edu.tr				ECTS Credit	0	5				

Course Name <i>This information will appear in the printed catalogs and on the web online catalog.</i>	
English Name	Optical Communication Systems
Turkish Name	Optik Haberleşme Sistemleri

Course Description <i>Provide a brief overview of what is covered during the semester. This information will appear in the printed catalogs and on the web online catalog. Maximum 60 words.</i>	
Introduction to optical fibers, propagation of light and mode structure in optical fibers, optical fiber communications link design, attenuation and dispersion, Optical sources, transmitters, detectors and receivers, introduction to Free Space Optics (FSO) systems, propagation of light in FSO, FSO link design, optical wireless communication in underwater environment, all optical networking	

Prerequisites (if any) <i>Give course codes and check all that are applicable.</i>	1 st	2 nd	3 rd	4 th
	<input type="checkbox"/> Consent of the Instructor	<input type="checkbox"/> Senior Standing	<input type="checkbox"/> Give others, if any. <input type="text"/>	
Co-requisites (if any)	1 st	2 nd	3 rd	4 th
Course Type <i>Check all that are applicable</i>	<input type="checkbox"/> Must course for dept. <input type="checkbox"/> Must course for other dept.(s) <input checked="" type="checkbox"/> Elective course for dept. <input checked="" type="checkbox"/> Elective course for other dept.(s)			

Course Classification <i>Give the appropriate percentages for each category.</i>					
Category	Mathematics & Natural Sciences	Engineering Sciences	Engineering Design	General Education	Other
Percentage	10%	60%	25%	5%	0%

Part II. Detailed Course Information**Course Objectives**

Explain the aims of the course. Maximum 100 words.

The aim of the course is to introduce the basic concepts of optical fiber and free space optics communication (FSO) systems. Design criteria of optical fiber and FSO links is presented.

Learning Outcomes

Explain the learning outcomes of the course. Maximum 10 items.

1. Basics of optical fiber communication systems.
2. Basics of free space optics communication systems.
3. Design criteria of optical fiber communication systems.
4. Design criteria of free space optics communication systems.

Textbook(s)

List the textbook(s), if any, and other related main course materials.

Author(s)	Title	Publisher	Publication Year	ISBN
S. C. Gupta	Textbook on Optical Fiber Communication and its Applications	PHI Learning Private Limited	2012	978-81-203-4580-5

Reference Books

List the reference books as supplementary materials, if any.

Author(s)	Title	Publisher	Publication Year	ISBN

Teaching Policy

Explain how you will organize the course (lectures, laboratories, tutorials, studio work, seminars, etc.)

- 3 hours of lecturing per week
- 7 homeworks

Laboratory/Studio Work

Give the number of laboratory/studio hours required per week, if any, to do supervised laboratory/studio work, and list the names of the laboratories/studios in which these sessions will be conducted.

There is no laboratory/studio work involved in this course.

Computer Usage

Briefly describe the computer usage and the hardware/software requirements in the course.

There is no computer usage and the hardware/software requirements in this course.

Course Outline

List the topics covered within each week.

Week	Topic(s)
1	Introduction to Optical Fibers
2	Propagation of Light in Optical Fibers
3	Mode Structure in Optical Fibers
4	Optical Fiber Communications Link Design
5	Attenuation in Optical Fibers, Power Budget Analysis
6	Dispersion in Optical Fiber Communications
7	Optical Sources and Detectors used in Optical Fiber Systems
8	Optical Fiber Transmitter
9	Optical Receiver Systems

10	Introduction to Free Space Optics (FSO) Systems
11	Propagation of Light in FSO
12	FSO Link Design
13	Optical Wireless Communication in Underwater Medium
14	All Optical Networking

Grading Policy								
<i>List the assessment tools and their percentages that may give an idea about their relative importance to the end-of-semester grade.</i>								
Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage
Homework	7	5	Case Study			Attendance	42	5
Quiz			Lab Work			Field Study		
Midterm Exam	1	40	Class Participation			Project		
Term Paper			Oral Presentation			Final Exam	1	50

ECTS Workload			
<i>List all the activities considered under the ECTS.</i>			
Activity	Quantity	Duration (hours)	Total Workload (hours)
Attending Lectures (<i>weekly basis</i>)	14	3	42
Attending Labs/Recitations (<i>weekly basis</i>)	0	0	0
Preparation beforehand and finalizing of notes (<i>weekly basis</i>)	14	1	14
Collection and selection of relevant material (<i>once</i>)	1	3	3
Self study of relevant material (<i>weekly basis</i>)	14	1	14
Homework assignments	7	2	14
Preparation for Quizzes			
Preparation for Midterm Exams (<i>including the duration of the exams</i>)	1	15	15
Preparation of Term Paper/Case Study Report (<i>including oral presentation</i>)	0	0	0
Preparation of Term Project/Field Study Report (<i>including oral presentation</i>)	0	0	0
Preparation for Final Exam (<i>including the duration of the exam</i>)	1	20	20
TOTAL WORKLOAD / 25			4.88
ECTS Credit			5

Total Workloads are calculated automatically by formulas. To update all the formulas in the document first press CTRL+A and then press F9.

Program Qualifications vs. Learning Outcomes						
<i>Consider the below program qualifications determined in terms of learning outcomes of all the courses in the curriculum and capabilities. Look at the learning outcomes of this course given above. Relate these two using the Likert Scale by marking with X in one of the five choices at the right..</i>						
No	Program Qualifications	Contribution				
		0	1	2	3	4
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to Electrical and Electronics Engineering; ability to apply theoretical and practical skills in these areas to complex engineering problems.				X	
2	Ability to identify, define, formulate and solve complex Electrical and Electronics Engineering problems; for this purpose, developing skills to select and apply appropriate analysis and modeling methods.				X	
3	Ability to design a complex system, process, device or product under realistic constraints and conditions that meet certain requirements; for this purpose, developing skills to apply modern design methods.				X	
4	Ability to devise, select, and use modern techniques and tools required to analyze and solve complex problems encountered in Electrical and Electronics Engineering practice; ability to use information technologies effectively.				X	
5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex problems or research areas related to Electrical and Electronics Engineering.		X			
6	Ability to function on intra-disciplinary and multi-disciplinary teams; ability to work independently.			X		
7	Ability to communicate effectively in oral and written Turkish; knowledge of at least one foreign language (English in particular); ability to write a report effectively and to comprehend a written report, ability to prepare reports on design and production, ability to make a presentation effectively, ability to give and receive clear and intelligible instructions.		X			
8	Awareness about the need for life-long learning; ability to access information, ability to keep abreast of the latest developments in science and technology, ability to continuously stay up-to-date.	X				
9	Act in compliance with ethical principles, awareness of professional and ethical responsibility; knowledge about standards for engineering practices.		X			
10	Knowledge about business solutions, such as, project management, risk management and change management; awareness about entrepreneurship, innovation; knowledge about sustainable development.		X			
11	Knowledge about global and societal impacts of engineering solutions on health, environment and safety, and engineering aspects of contemporary problems; awareness of legal consequences of engineering solutions.	X				

Contribution Scale to a Qualification: **0**-None, **1**-Little, **2**-Medium, **3**-Considerable, **4**-Largest**Part III New Course Proposal Information***State only if it is a new course*

Is the new course replacing a former course in the curriculum?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Former Course's Code			Former Course's Name		
Is there any similar course which has content overlap with other courses offered by the university?		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Most Similar Course's Code			Most Similar Course's Name		
Frequency of Offerings <i>Check all semesters that the course is planned to be offered.</i>		<input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Summer							
First Offering	Academic Year	2 0 1 6 / 2 0 1 7			Semester <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring				
Maximum Class Size Proposed	<input type="text" value="50"/>	Student Quota for Other Departments	<input type="text" value="10"/>	Approximate Number of Students Expected to Take the Course			<input type="text" value="25"/>		
Justification for the proposal <i>Maximum 80 words</i>									
This course will provide information on different optical communication systems such as optical fiber, free space optics and underwater optical wireless systems. Propagation, link design and applications of these systems will be introduced. At the end of the course, the students will know why and how different optical communication systems are employed in telecommunications infrastructure.									

Part IV Approval

Proposed by	Faculty Member <i>Give the Academic Title first.</i>	Signature	Date
	Prof. Dr. Yahya Kemal BAYKAL		16/02/2015

Departmental Board Meeting Date	11.05.2015	Meeting Number	2015-04-05	Decision Number	2015/05
Department Chair	Prof. Dr. Yahya Kemal BAYKAL	Signature		Date	

Faculty Academic Board Meeting Date		Meeting Number		Decision Number	
Dean	Prof. Dr. Celal Zaim ÇİL	Signature		Date	

Senate Meeting Date		Meeting Number		Decision Number	
---------------------	--	----------------	--	-----------------	--