Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
FİZ4013	**3**	**0**	**0**	**3**	**5**	**E**	**TR**	**4/FALL**
Course Name (Turkish**)**	Güneş Enerjisi Tekniği							
Course Name (English**)**	Solar Energy Technique							

Unit/Program	Physics Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	Giving students basic information about solar energy techniques
Course Outline	Solar Furnaces, Direct Electricity Generation, Applications of Solar Energy in Space, Low Temperature Use of Solar Energy, Large Thermodynamic Power Plants
Textbook/ Material / Resources	1. Solar Energy-Abdul Vahap Yiğit, İbrahim Atmaca, Dora Publishing House, 2018 2. Solar Energy and Its Applications-H. Hüseyin Öztürk, Birsen Publishing House, 2012
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**
Gazi University	**Technical Sciences Vocational School Electronics and Automation Department**	**Solar Energy**	**2-1-0-3; 2**	**E**

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Instructors who can teach the course (Title, Name and Surname)	*Signature*

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

Face-to-face courses will be taught under the supervision of the relevant faculty member.

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)

Stakeholder Name	**Opinion** (It should be given as a summary, it should not exceed two lines.)

Weekly Course Content Distribution		
Week	**Theory**	**Application/Laboratory**
1	Solar radiation, measurement of total energy received, measurement of absorption in the atmosphere,	
2	Identification of the Solar Constant: a. Through Total Measurement, b. Through Spectrophotometric Measurements, c. Value of the Solar Constant	
3	Solar Measurements: a. Pyrheliometers, b. Pyranometers, c. Measurement of Sunshine Time, d. A Few Results Obtained in Solar Measurements, History of solar energy	
4	Condensation of Solar Radiation: a. Theoretical Condensation, b. Actual Condensation, c. Temperature of a Solar Furnace	
5	Construction of Solar Ovens: a. Construction of Hollow Mirrors, b. Odeillo (Font-Romeu) Furnace	
6	Construction of Guiding Arrangements: a. Plane Mirrors, b. Legs and Their Operation, c. Applications of Solar Ovens	
7	Taking Solar Energy into the Focus of the Hollow Mirror: a. Processing in the Hollow System, b. Processing under Atmospheric Conditions, c. Instantaneous Pyrolysis of Wood Residues: Applications of Solar Furnaces in Metallurgy and Chemistry, Purification of Substances, Heat Shock	
8	Semiconductors: a. Real and External Dependent Semiconductors, b. Energy Bands in a Crystal, c. p-n Joint, d. Solar Photopiles	
9	Midterm Exam	
10	Construction of Silicon Solar Photopiles, CdS-Cu2S Cells, Schottky Cells, Use of Solar Cells	
11	Generation of Electrical Energy in Spacecraft, Orbital Solar Power Plants	
12	Non-Optical Concentration or Weakly Concentrated Collection: a. Identification of an Aggregator, b. Efficiency of a Plane Collector, c. Greenhouse Effect, Moderate Optical Concentration Collection	
13	Water Heating, Mechanical Power Generation, Solar Coolers, Ventilation of Residential Buildings, Distillation of Water	
14	Transmission and Collection of Energy to Heat Carrier Fluid, Solar Field, Conversion of Heat Energy to Mechanical Energy, Storage of Energy	
15	Final Exam	
16		

Assessment			
	Activity	**Custom**	**Contribution to Success Grade (%)**
Evaluation Criteria	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	60
	Engineering Sciences	40
	Social Sciences	

	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	**Number**	**Duration (Hours)**	**Total workload (Hours)**
Fieldwork			
Midterm Exam Application	1	2	2
Self-Study (including pre-class and exam preparation)	14	2	28
Make-up Exam	1	2	2
Experiment and Observation			
Class Participation (Theory)	14	3	42
Homework			
Final Exam Practice	1	2	2
Laboratory			
Article Review			
Writing an Article			
Reading			
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work	12	3	36
Argument	14	1	14
Application/Practice			
Other			
TOTAL WORKLOAD:			**126**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**5**

	Program Outcomes (PO) / **Learning Outcomes (LO)** *(Course Outcomes)*	1	2	3	4	5	6	7	8	9	10	11
1	Learning how to obtain electrical energy from solar energy	**5**	**5**	**5**	**4**	**3**	**3**	**4**	**5**	**5**	**1**	**1**
2	Learning the structure of photopiles and their working mechanism	**5**	**5**	**5**	**4**	**3**	**3**	**4**	**5**	**5**	**5**	**1**
3	Acquisition of knowledge for the development of new systems for electrical energy generation	**5**	**5**	**5**	**4**	**3**	**3**	**4**	**5**	**5**	**4**	**1**

Organizer: Prof. Dr. Cengiz TATAR
Preparation Date: 20.05.2024