ECTS COURSE INFORMATION FORM

Faculty	**Faculty of Engineering**	
Program	**B.Sc. in Civil Engineering**	**Required**
	B.Sc. in Computer Engineering	**Required**
	B.Sc. in Electrical-Electronics Engineering	**Required**
	B.Sc. in Industrial Engineering	**Required**
	B.Sc. in Mechanical Engineering	**Required**

Course Code	PHY104L			
Course Title in English	Physics II Laboratory			
Course Title in Turkish	Fizik II Laboratuvarı			
Language of Instruction	English			
Type of Course	Laboratory			
Level of Course	Undergraduate			
Course Category (by % of Content)	Basic Science	Basic Engineering	Engineering Design	General Education
	80%	20%	-	-
Semester Offered	Fall			
Contact Hours per Week	Lecture: -	Recitation: -	Lab: 2 hours	Other: -
Estimated Student Workload	40 hours			
Number of Credits	2 ECTS			
Grading Mode	Standard Letter Grade			
Pre-requisites	None			
Expected Prior Knowledge	None			
Co-requisites	None			
Registration Restrictions	Only Undergraduate Students			
Overall Educational Objective	Through hands-on experiments in laboratory, to acquire a solid understanding of the subjects and concepts related with the electricity and magnetics produced from static and moving charges which covered in the related Physics II course.			
Course Description	This laboratory course includes the topics related to electromagnetism. The laboratory experiments covered in this course are based on the measurement of current, magnetic fields and potential differences using proper tools. These tools are used for the purpose of determining some of the electrical parameters such as resistance, power, inductance and capacitance. Using magnetic field sensors, magnetic field around conductors having various geometries are measured and current-magnetic field relations are obtained. Dependence of magnetic field strength with the distance from the source is also extracted.			
Course Description in Turkish	Bu laboratuvar dersi elektromanyetizma ile ilgili konuları içermektedir. Bu laboratuvar da yer alan deneyler, gerekli cihazlar kullanarak akım, manyetik alan şiddeti ve potansiyel farkı ölçümleri ile yapılmaktadır. Bu cihazlar sayesinde yapılan ölçümlerden direnç, güç, indüktans ve kapasitans değerleri tayin edilir. Manyetik alan sensörleri kullanılarak yapılan ölçümlerden, farklı geometriler için akım manyetik alan şiddeti ilişkileri çıkarılmaktadır. Ayrıca, manyetik alan şiddetinin uzaklıkla nasıl değiştiği gözlenmektedir.			
Course Learning Outcomes and Competences	Upon successful completion of the course, the learner is expected to: 1. explain the roles of circuit elements such as resistors, transformers, capacitors and inductors; 2. demonstrate knowledge in electric circuits; 3. explain mechanisms to produce magnetic fields around current lines and coils; 4. apply the concepts of electric field and electric potential; 5. collect data using a variety of equipment, record and organize data in tables and graphs, interpret data while estimating sources of error in a measurement, and draw conclusions; 6. demonstrate awareness to work safely in laboratory environment.			

Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
Student Outcomes	N=None S=Supportive H=High		Exam, Project, HW, Experiment, Presentation, etc.
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	H	1,2,3,4	Final Exam
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors			
(3) an ability to communicate effectively with a range of audiences			
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	S	6	Safety Exam
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives			
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	H	5	Lab Reports
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies			

Prepared by and Date	Prof. Dr. Ahmet Giz / January 2020	
Name of Instructor	Prof. Dr. Ahmet Giz	
Semester	2019-2020 Spring	
Course Contents	Week	Topic
	1.	Introduction and Safety Measures
	2.	Basic Measurements
	3.	Resistance of a Conductor
	4.	Ohm’s Law
	5.	Wheatstone Bridge
	6.	Kirchoff’s Laws
	7.	Equipotential Surfaces
	8.	Discharge curve of a capacitor
	9.	Magnetic Field Strength Near a Straight Line
	10.	Biot Savart Law
	11.	Transformer
	12.	Self-Inductance
	13.	Make up week
	14.	Designing own experiment
	15.	Final Exam/Project/Presentation Period
	16.	Final Exam/Project/Presentation Period
Required/Recommended Readings	Physic 104L Experiments Sheets (will be given by instructor) Sears & Zemansky's University Physics, Hugh D. Young, Roger A. Freedman, Vol.2, 14th Edition, Addison-Wesley, 2015	
Teaching Methods	Students should come to the laboratory as reading their experiments beforehand. They will perform the experiment by the help of the instructor. They are obligated to bring their lab. sheets and get it signed by the instructor at the end of the lab. They will graph their results in situ.	
Homework and Projects	No homework provided in this course	

Laboratory Work	Yes
Computer Use	Calculator and ruler are required. Drawing their graphs with excel is suggested if the students bring notebook computer.
Other Activities	The students should know the concepts of their experiments to be performed.
Assessment Methods	The assessment of this course will include: 5 % Physics Laboratory Safety Rules Quiz 10% Final Exam 85 % Reports of Experiments • Graphs (40 points) • Experimental Data (30 points) • Results (15 points) + 15 points (if you choose your own sentences) if there is no graph in the experiment, 20 points are added to other parts. 10% contribution will be made to the students who want to design their own experiments at the end of the semester. Experiments should be applicable and relevant to the course content.
Course Administration	Students are expected to attend min. 10 out of 11 experiments. There are 2 make-up weeks for the missed labs and to be able to attend them, students must complete min. 8 experiments during the semester. There will be no reduction from the attendance score for the experiments students miss. The students are expected to pursue in this class with honesty and integrity. Disciplinary action will be pursued in all instances if academic dishonesty and cheating has occurred. Students with disabilities should consult the instructor for their special needs. For any question, please consult the instructor via mail or phone

ECTS Student Workload Estimation

Activity	No/Weeks	Hours			Calculation	Explanation
	No/Weeks per Semester (A)	Preparing for the Activity (B)	Spent in the Activity Itself (C)	Completing the Activity Requirements (D)		
Lectures	10	1	1.5	0.5	30	A*(B+C+D)
Problem Sessions					0	A*(B+C+D)
Quizzes					0	A*(B+C+D)
Midterm(s)					0	A*(B+C+D)
Final Examination	1	8	2	0	10	A*(B+C+D)
Total Workload					40	
Total Workload/25					1.6	
ECTS					2	