AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Experimental Superconductivity								
Course Code	EEE564		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	This course aims to teach experimental superconductivity.								
Course Content	Maxwell's equations, Magnetism in matter, magnetic materials, Superconductivity, High Tc superconductivity, BSCCO, YBCO, preparation and characterization of bulk High Tc materials experimentally, Meissner effect, Superconducting magnets, superconducting cables, superconducting maglev trains (experimental work will be performed in the Electrical Measurement Lab).								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Discussion, Case Study, Project Based Study, Individual Study, Problem Solving								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	35
Laboratory	4	35

Recommended or Required Reading	
1	Serway R. A., Physics for Scientists and Engineers, 3rd ed. (updated version), Saunders College Publishing, International ed., 1992
2	Rose-Innes A.C., Rhoderick E. H., Introduction to Superconductivity, 2nd ed., Pergamon, GBR, 1980
3	Narlikar A. V., High Temperature Superconductivity 1: Materials, Springer-Verlag, Berlin, 2004
4	Narlikar A. V., High Temperature Superconductivity 2: Engineering Applications, Springer-Verlag, Berlin, 2004
5	Lecture notes, lab instructions, and Internet sources

Week	Weekly Detailed Course Contents	
1	Theoretical	Maxwell's equations and Magnetism in matter, magnetic materials (Revision)
2	Theoretical	Introduction to superconductivity, Perfect Diamagnetism and Meissner effect, High Tc superconductivity
3	Theoretical	Type-I Superconductivity
4	Theoretical	Type-II Superconductivity
5	Theoretical	Superconducting material and cable production methods, doping mechanism and structural characterization in high Tc superconductivity (XRD, SEM, RBS, etc.)
6	Theoretical	Electrical characterization of high Tc superconductors
7	Practice	Experiment 1: Production of high Tc superconductors (YBCO)
8	Intermediate Exam	Midterm Exam
9	Practice	Experiment 2: Production of high Tc superconductors (BSCCO)
10	Practice	Experiment 1&2 continuing
11	Practice	Experiment 3: Electrical characterization of High Tc superconductors (YBCO)
12	Practice	Experiment 4: Electrical characterization of High Tc superconductors (BSCCO)
13	Practice	Experiment 3&4 continuing + structural characterization
14	Practice	Project work (experimental)
15	Practice	Project work (experimental)
16	Final Exam	Final Exam (project)

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	6	5	3	48
Project	2	12	3	30
Laboratory	6	12	3	90

Midterm Examination	1	12	2	14
Final Examination	1	15	3	18
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	Can understand the magnetism in matter
2	Can comprehend the nature of superconductivity
3	Can understand the structural and electrical properties of high Tc superconductivity
4	Can produce and perform the structural and electrical characterizations of superconducting high Tc bulk materials experimentally
5	Can understand the superiority of high Tc superconductivity in engineering applications

Programme Outcomes *(Electrical and Electronics Engineering Master)*	
1	Developing and intensifying knowledge that requires expertise in the area of Electrical-Electronics Engineering, and gaining the skills necessary to analyze and solve problems using this knowledge
2	Grasping the inter-disciplinary interaction related to Electrical-Electronics Engineering, interpreting and forming new types of knowledge by combining the knowledge from Electrical-Electronics Engineering and the knowledge from various other disciplines
3	Developing new approaches to solve the complex problems arising in Electrical-Electronics Engineering, coming up with solutions while taking responsibility and carrying out a specific study independently
4	Assessing the knowledge and skill gained in the area of Electrical-Electronics Engineering with a critical view
5	Transferring the current developments and one’s own work in Electrical-Electronics Engineering, to other groups in written, oral and visual forms
6	The ability to control the collecting, interpreting, practicing and announcing processes of the Electrical-Electronics Engineering related to data taking into consideration scientific, cultural and ethical values and the ability to teach these values to others
7	Developing application plans concerning the subjects related to Electrical-Electronics Engineering and the ability to evaluate the end results of these plans within the frame of quality processes

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	4	4	4	4	4
P2	4	4	4	4	4
P3	4	4	4	4	4
P4	4	4	4	4	4
P5	4	4	4	4	4
P6	4	4	4	4	4
P7	4	4	4	4	4