COURSE IDENTIFICATION FORM							
Course Code and Name: IM5048 ADVANCED MATERIALS SCIENCE				**Department of : GRADUATE EDUCATION INSTITUTE / DEPARTMENT OF CIVIL ENGINEERING / MASTER'S PROGRAMME WITH THESIS**			
Semester	**Theoretic Hour**	**Practice Hour**	**Total Hour**	**Credits**	**ECTS**	**Education Language**	**Type: Compulsory Elective**
Fall	3	0	3	3	5	Turkish	Optional
Prerequisite (s)							
Instructor		Assoc. Prof. Berivan YILMAZER POLAT				**Mail :** **Web :**	
Course Assistant						**Mail :** **Web :**	
Groups / Classes							
Course Aim	Gaining knowledge about the importance of materials science, the use and selection of materials, atomic structure, arrangement of atoms, crystal structures, crystal structure defects, diffusion of atoms, phase diagrams, mechanical properties of materials, corrosion behaviour and magnetic properties.						
Course Goals	Based on the image, the course goals likely focus on imparting knowledge and understanding in several key areas of materials science.: **Importance of Materials Science**: Understand the significance of materials science in engineering and technology. Appreciate the role of materials in the development and performance of various applications. **Use and Selection of Materials**: Learn how to choose appropriate materials for different applications based on their properties and performance. Understand the criteria and methodologies for material selection in engineering design. **Atomic Structure**: Study the fundamental concepts of atomic structure and how they relate to material properties. Understand the electronic configuration of atoms and how it affects bonding and material behavior. **Crystal Structures**: Gain knowledge about various crystal structures and their characteristics. Understand the relationship between crystal structure and material properties. **Crystal Structure Defects**: Study the types of defects in crystal structures, including point defects, dislocations, and grain boundaries.						

	Understand how these defects affect material properties and behavior. **Mechanical Properties of Materials**: Understand the mechanical properties of materials, such as strength, hardness, ductility, and toughness. Learn about the testing methods used to evaluate these properties. **Corrosion Behaviour**: Study the mechanisms of corrosion and how different materials react to environmental factors. Understand methods to prevent or mitigate corrosion in engineering applications. **Magnetic Properties**: Learn about the magnetic properties of materials and their applications. Understand concepts such as ferromagnetism, paramagnetism, and diamagnetism. These goals aim to provide students with a comprehensive understanding of the fundamental principles and practical applications of materials science.
Course Learning Outs and Proficiencies	- Atomic structure forming the basis of materials science - Crystal structures and crystal structure defects - Phase diagrams - Mechanical properties and corrosion behaviour of materials - Magnetic properties of materials
Course Basic and Auxiliary Contexts	Uzun H. F. Mühendisler İçin Malzeme Biliminin Temel İkeleri, 2012, Değişim Yayınları
Methods of Give a Lecture	Face to Face

		If Available, to Sign (x)	**General Average Percentage (%) Rate**
Assessment Criteria	**1. Quiz**	**X**	**50**
	2. Quiz		
	3. Quiz		
	4. Quiz		
	5. Quiz		
	Oral Examination		

	Practice Examination (Laboratory, Project etc.)		
	Final Exam	**X**	**50**

Semester Course Plan

Week	Subjects
1	Introduction Material Information
2	Atomic Bond
3	Crystal Structures
4	Crystal Structure Defects
5	Mechanical Properties
6	Phase Diagrams
7	Midterm exam
8	Kinetics of Transformations and Thermal Processes
9	Metals and Alloys
10	Polymers
11	Ceramics and Glass
12	Composites
13	Environment Effects
14	Electrical and Magnetic Properties