COURSE IDENTIFICATION FORM

Course Code and Name: IM5057 INTERNAL STRUCTURE AND PROPERTIES OF BUILDING MATERIALS				**Department of :** CIVIL ENGINEERING / MASTER PROGRAMME			
Semester	**Theoretic Hour**	**Practice Hour**	**Total Hour**	**Credits**	**ECTS**	**Education Language**	**Type: Compulsory Elective**
Atumn/Spring	3	0	3	3	5	Turkish	Optional

Prerequisite (s)		
Instructor	Assoc. Prof. Dr. Nihan GÜLMEZ	**Mail :** nihangulmez@munzur.edu.tr **Web :**
Course Assistant		**Mail :** **Web :**
Groups / Classes		
Course Aim	• To provide knowledge, skills and competence on the relationships between the internal structure and properties of materials, • To provide knowledge, skills and competence on theories of creep and shrinkage in concrete. • Providing knowledge, skills and competence on new cement-based materials	
Course Goals	The goals of this course is to emphasize the basic principles necessary for an understanding of the fundamental nature and properties of engineering materials and to make clear the significance of these principles in engineering practice. The objective has been to present a unified treatment of a variety of materials, stressing the fundamentals which provide a common basis for explaining the behavior of the varied materials.	
Course Learning Outs and Proficiencies	• Internal structure and properties of materials • Elastic and plastic behavior • Uniaxial and multiaxial loading cases • Shrinkage and creep concepts • Technological Features • New cement-based materials	
Course Basic and Auxiliary Contexts	• Shakelford , F. J., Introduction to Materials Science For Engineers , 4th Ed. Prentice Hall Int . Inc. , 1998 • Illston , J.M., Construction Materials : Their Nature and Behaviour , E and FN Spon , London , 1996 • Bangash , MYH, Concrete and Concrete Structures : Numerical Applications, Elsevier Applied Science , London , 1989.	
Methods of Give a Lecture	Face to Face	

Assessment Criteria		**If Available, to Sign (x)**	**General Average Percentage (%) Rate**
	Midterm Exam	**X**	**50**
	1. Quiz		
	2. Quiz		
	3. Quiz		
	4. Quiz		
	Oral Examination		
	Practice Examination (Laboratory, Project etc.)		
	Final Exam	**X**	**50**

Semester Course Plan

Week	Subjects
1	Internal structure of materials (metals, concrete, plastics and ceramics)
2	Relationships between internal structure and properties of materials
3	Elastic and plastic behavior
4	Fracture under uniaxial loading
5	Deformation and fracture under multiaxial loading
6	Some mechanical models for concrete under multiaxial loading
7	Midterm Exam
8	Shrinkage , creep and stress relaxation
9	Creep and shrinkage theories in concrete, Fatigue
10	Technological properties: hardness, wear resistance, impact resistance
11	Technological properties: plastic shaping, adhesion
12	New cement-based materials
13	New cement-based materials
14	Final Exam