

COURSE IDENTIFICATION FORM

Course Code and Name: IM5008 BINDER AND MIXTURE EXPERIMENTS

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. Mustafa AKPOLAT				Mail : mustafaakpolat@munzur.edu.tr Web :	
Course Assistant						Mail : Web :	
Groups / Classes							
Course Aim		Investigation of the behavior of bituminous binders and mixtures, teaching the experiments and methodologies 9used in binder and mixture design					
Course Goals		Bituminous binders, Refinery asphalts, Natural asphalts, Use of bituminous binders in highway, Test methods used in classification of asphalt cements, SUPERPAVE binder specification, Conventional (penetration, softening point, ductility, viscosity, Fraass breaking point) binder tests, Dynamic shear rheometer test, Beam bending rheometer test, Rotational viscometer test, Rotational thin film heating test, The use of kneading press in the design of bituminous hot mixtures, The use of roller press in the compaction of bituminous hot mixtures, Comparison of Marshall and Superpave mix design methods, Determination of stiffness, resistance to moisture damage, fatigue life of bituminous hot mixtures, Determination of resistance to permanent deformation of bituminous mixtures by wheel track test.					
Course Learning Outs and Proficiencies		1. Learning the properties of bituminous binders 2. To learn conventional and Superpave test methods and their applications 3. Learning Marshall and mix designs 4. Learning binder experiments 5. Learning mixture experiments					
Course Basic and Auxiliary Contexts		1. Anderson, R.M. ve McGennis, R.B., 1994. Superpave Asphalt Mixture Design Illustrated Level 1 Lab Methods, National Asphalt Training Center Demonstration Project 101, FHWA-SA-95-004, 80 p., Asphalt Institute, Lexington, KY. 6. AASHTO TP5-98, 1998. Standard Test Method for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer, American Association of State Highway and Transportation Officials					

(AASHTO), Washington DC.

4. AASHTO PP1-98, 1998. Standard Practice for Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel, American Association of State Highway and Transportation Officials (AASHTO), Washington DC.

2. Asphalt Institute, 1996. Superpave Mix Design, Superpave Series No. 2 (SP-2), 128 p., USA.

3. Harigan, E.T., Leahy, R.B. ve Youtcheff, J.S., 1994. The Superpave Mix Design System Manual of Specifications, Test Methods, and Practices, Strategic Highway Research Program, SHRP-A-379, National Research Council, Washington D.C.

5. AASHTO TP1-98, 1998. Standard Test Method for Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer, American Association of State Highway and Transportation Officials (AASHTO), Washington DC.

7. AASHTO TP48, 1997. Standard Test Method for Viscosity Determination of Asphalt Binder Using Rotational Viscometer, American Association of State Highway and Transportation Officials (AASHTO), Washington DC.

Methods of Give a Lecture

Face to Face

Assessment Criteria		If Available, to Sign (x)	General Average Percentage (%) Rate
	Midterm Exam	X	40
	1. Quiz		
	2. Quiz		
	3. Quiz		
	4. Quiz		
	Oral Examination		
	Practice Examination (Laboratory, Project etc.)		
	Final Exam	X	60
Semester Course Plan			
Week	Subjects		
1	Bituminous binders, Refinery asphalts, Natural asphalts, Use of bituminous binders in highway		

2	Test methods used in the classification of asphalt cements
3	Penetration, viscosity and SUPERPAVE binder specification
4	Conventional (penetration, softening point, ductility, viscosity, Fraass breaking point) binder tests and application
5	Dynamic shear rheometry experiment and application
6	Beam bending rheometer test and application
7	Rotational viscometer and Rotational thin film oven test and applications
8	Use of kneading press in the design of bituminous hot mixtures, Use of roller press in the compaction of bituminous hot mixtures
9	MIDTERM EXAM
10	Comparison of Marshall and Superpave mix design methods; specimen preparation and design by both methods
11	Comparison of Marshall and Superpave mix design methods; specimen preparation and design by both methods
12	Determination of the stiffness of bituminous hot mixtures and their resistance to moisture damage
13	Determination of fatigue life of bituminous hot mixtures
14	Determination of resistance of bituminous mixtures against permanent deformation by rutting test.