COURSE IDENTIFICATION FORM

Course Code and Name: IM5018 TRANSPORTATION OF POROUS 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		**Mail :** **Web :**
Course Assistant		**Mail :** **Web :**
Groups / Classes		
Course Aim	To provide graduate students with the fundamentals of transport in porous materials. To provide solution methods for engineering problems related to porous media.	
Course Goals	Definition of porous materials, fundamentals of the continuum model of porous media, and derivation of general conservation equations of porous media. Definition of the properties of the medium and the requirements of the continuum model . Mass diffusion problem. Phase change in porous media. Charge transport in porous materials and numerical modeling.	

Course Learning Outs and Proficiencies	1. Definition of porous material
	    1.2.Definition of the continuum model
	    1.3.Description of the properties of the material medium
	 2. General conservation equations of material environment
	    2.2.The mass diffusion problem.
	    2.3.Phase change in porous media.
	 3. Charge transport in porous materials and its numerical modeling	

Course Basic and Auxiliary Contexts	J. Bear , Y. Bachmat " *Introduction to Modeling of Transport* *Phenomena in Porous Media* ", Kluwer Academic Publishers , 1991 - Cambyses Vafai , *" Handbook of Porous Media "* , Taylor&Francis , 2005. - Rassam , D., J. Šimůnek , and M. Th . van Genuchten , *Modeling Variably Saturated Flow with HYDRUS-2D* , ND Consult , Brisbane , Australia , 2003. - Šimůnek , J., M. Th . van Genuchten , and R. Kodešová (eds .), Proc . Ugh the 4th International Conference " *HYDRUS Software*	

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	Applications to Subsurface Flow and Contaminant Transport Problems ", March 21-22, 2013, Czech University of Life Sciences , Prague , Czech Republic , 2013
Methods of Give a Lecture	Narration, research, numerical modelling.

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

Semester Course Plan	
Week	**Subjects**
1	Definition of porous materials,
2	Fundamentals of the continuum model of porous media
3	Porosity , permeability, Darcy's law
4	General conservation equations of porous media
5	Description of the characteristics of the environment required by the continuity model
6	Mass diffusion problem
7	Phase change in porous media
8	transport in porous materials
9	transport in porous materials
10	Transportation problems in reinforced concrete structures
11	Transport problems in soil structures
12	Contamination retention of porous material
13	Numerical modeling of porous material
14	Numerical modeling of porous material

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