

Course Title-Course Code: DYNAMIC MODELLING OF FLOWS IN RIVERS, COASTAL AND INLAND WATERS- IM629					Name of the Programme: CIVIL ENGINEERING				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Field Study	HW	Other	Total	Credit	ECTS Credit
1-2	42	0	0	0	56	90	188	3	7.5
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	-								
Course Contents	Fundamental hydrodynamics principles and equations, finite difference method and its application to Navier-Stokes equations, development, calibration, verification and application of numerical codes for flow prediction in rivers, coastal and inland waters, investigation of well known numerical models and their applications								
Course Objectives	To provide students with fundamental principles of hydrodynamics enabling them to develop, calibrate and verify numerical models to simulate flow in rivers, coastal and inland waters and the ability to evaluate the outputs of such models								
Learning Outcomes and Competences	Understanding of fundamental hydrodynamics principles, application in numerical codes and interpretation of the numerical model predictions								
Textbook and /or References	<p>Tannehill, J.C., Anderson, D.A., Pletcher, R.H. (1997) Computational Fluid Mechanics and Heat Transfer, Taylor&Francis Publishing, Second Edition, Washington DC, USA.</p> <p>Chung, T.J. (2002) Computational Fluid Dynamics, Cambridge University Press, Cambridge, UK.</p> <p>Martin, J.L., McCutcheon, S.C. (1999) Hydrodynamics and Transport for Water Quality Modeling, CRC Press, Inc., Lewis Publishers, New York, USA.</p> <p>Abbott, M.B., Price, W.A. (1994) Coastal, Estuarial and Harbour Engineers' Reference Book, First Edition, E&FN Spon Publishing, Chapman &Hall, London, UK.</p> <p>Bates, P.D., Lane, S.N., Ferguson, R.I. (2005) Computational Fluid Dynamics: Applications in Environmental Hydraulics, John Wiley& Sons Ltd, West Sussex, England, UK.</p>								
Assessment Criteria								<i>If any, mark as (X)</i>	Percent (%)
	Midterm Exams							X	30
	Quizzes								
	Homeworks							X	20
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50

Instructors	Assist. Prof. Dr. Müsteyde Baduna KOÇYİĞİT
Week	Subject
1	Fundamental hydrodynamics principles and governing equations
2	Fundamental hydrodynamics principles and governing equations
3	Finite difference method and its application to governing hydrodynamic equations
4	Finite difference method and its application to governing hydrodynamic equations
5	Numerical models studies: modelling approaches, computational domain, input data, co-ordinate systems, solution methods, boundary conditions etc.
6	I.Mid-term exam
7	Numerical models studies (continue)
8	Numerical models studies (continue)
9	Flow simulation in rivers and a model application
10	Flow simulation in rivers and a model application
11	Hydrodynamic modelling of coastal and inland waters and a model application
12	Hydrodynamic modelling of coastal and inland waters and a model application
13	II. Mid-term exam
14	Hydrodynamic modelling of coastal and inland waters and a model application