

ECTS

EUROPEAN CREDIT TRANSFER SYSTEM

Course information in english

General course information:

Course title:	Environmental Fluid Mechanics	Course code:	CE09_H04
Credits:	5	Work load (hours):	116
Course level:	Undergraduate <input checked="" type="checkbox"/>	Graduate <input type="checkbox"/>	
Course type:	Mandatory <input type="checkbox"/>	Selective <input checked="" type="checkbox"/>	
Course category:	Basic <input type="checkbox"/>	Orientation <input checked="" type="checkbox"/>	
Semester:	9 ^o	Hours per week:	4 hours
Course objectives (capabilities pursued and learning results):			
The course objective is to familiarize the students with the application of the principles and methods of Fluid Mechanics to the analysis of the environmental flows and the design of typical hydraulic works for the protection of the environment, especially those related to the protection of coastal waters and the atmosphere.			
Prerequisites:			
Fluid mechanics Hydraulics Mathematical models of pollution			

Instructor's data:

Name:	Evangelos Keramaris
Level:	Assistant Professor
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Tel. – email:	ekeramaris@civ.uth.gr
Other tutors:	-

Specific course information:

Week No.	Course contents	Hours	
		Course attendance	Preparation
1	Introduction.	4	2
2	Homogeneous fluids. Mixtures. Salinity. Pollutants.	4	2
3	Molecular diffusion. Fick's law. Diffusion equation.	4	2
4	Turbulent diffusion and dispersion.	4	2
5	Taylor's analysis.	4	2
6	Mixing in lakes and reservoirs.	4	2
7	Mixing in rivers.	4	2
8	Discharge dynamics.	4	2
9	Jets and plumes.	4	2
10	Turbulent jets and plumes.	4	2
11	Buoyant jets.	4	2
12	Boundary effects – Buoyancy effects.	4	2
13	Applications.	4	2
14	Special topics.	4	2

Additional hours for:			
Class project	Examinations	Preparation for examinations	Educational visit
20	2	10	

Suggested literature:

1. Antonopoulos, "Environmental Hydraulics & Quality of Free Surface Flows", Giahoudis-Giapoulis, 2003.
2. Dimitriou, I. D., "Environmental Hydraulics", Part A and B, Athens, 1994.
3. Fischer, H.B., List E.J., Koh, R.C.Y., Imberger J., Brooks, N.H., "Mixing in inland and coastal waters", Academic Press, 1979.

4. Gilbert M. Masters, "Introduction to Environmental Engineering and Science", Pearson Higher Education, 1997.
 5. Simpkins P.G. and A. Liakopoulos, " Stability of Convective Flows", ASME Press, 1992.

Teaching method (select and describe if necessary - weight):		
Teaching	<input checked="" type="checkbox"/>40%
Seminars	<input type="checkbox"/>%
Demonstrations	<input type="checkbox"/>%
Laboratory	<input checked="" type="checkbox"/>20%
Exercises	<input checked="" type="checkbox"/>40%
Visits at facilities	<input type="checkbox"/>%
Other (describe):	<input type="checkbox"/>%
Total		100%

Evaluation method (select)- weight:				
	<u>written</u>	<u>%</u>	<u>Oral</u>	<u>%</u>
Homework	<input type="checkbox"/>		<input type="checkbox"/>	
Class project	<input checked="" type="checkbox"/>	30	<input type="checkbox"/>	
Interim examination	<input checked="" type="checkbox"/>	20	<input type="checkbox"/>	
Final examinations	<input checked="" type="checkbox"/>	50	<input type="checkbox"/>	
Other (describe):	<input type="checkbox"/>		<input type="checkbox"/>	