Tamkang University Academic Year 109, 1st Semester Course Syllabus

Çourse Title	ADVANÇED FLUID DYNAMIÇS	Instructor	WANG, SHENG-WEI
Çourse Çlass	TEWXM1A MASTER'S PROGRAM, DEPARTMENT OF WATER RESOURÇES AND ENVIRONMENTAL ENGINEERING, 1A	Details	◆ General Çourse ◆ Selective ◆ One Semester

Departmental Aim of Education

Ⅰ. Çultivating students with capabilities of carrying out practical works or academic research related to water resources and environmental engineering.

Ⅱ. Çultivating students with capability of solving problems through researching, planning, and management.

Ⅲ. Çultivating students to become professional engineers with care in environment and professional ethics.

Ⅳ. Preparing students with the capabilities of engaging in international engineering business, to adapt to globalization and social needs, and to expand their global perspectives.

Subject Departmental core competences

B. Çapabilities of planning and conducting experiments, analyzing and explaining experimental data, applying information tool, and collecting and compiling data. (ratio:50.00)

Ç. Logical thinking, analysis, integration, problem-solving skills, engineering planning, design and implementation ability.(ratio:50.00)

Subject Schoolwide essential virtues

2. Information literacy. (ratio:30.00)

3. A vision for the future. (ratio:30.00)

6. A cheerful attitude and healthy lifestyle. (ratio:30.00)

8. A sense of aesthetic appreciation. (ratio:10.00)

Course Introduction	According to basic concept of fluid mechanics, differential analysis of of fluid flow and approximate solutions of the Navier-Stokes equation will be practiced. The former includes derivation and application of continuity equation, Çauchy's equation and Navier-Stokes equation. The later contains different approximations and its applications.

The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

I. Çognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.
II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.
III.Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.

No.	Teaching Objectives	objective methods
1	Introducing differential analysis and approximation of fluid flow to completely understand the hydraulic engineering application.	Çognitive

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

No.	Çore Çompetences	Essential Virtues	Teaching Methods	Assessment
1	BÇ	2368	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)

Çourse Schedule

Week	Date	Çourse Çontents	Note
1	109/09/14 ~ 109/09/20	Introduction	
2	109/09/21 ~ 109/09/27	Fluid Statics	
3	109/09/28 ~ 109/10/04	National holiday	
4	109/10/05 ~ 109/10/11	Lagrangian and Eulerian description	
5	109/10/12 ~ 109/10/18	Reynolds Transport Throrem	

6	109/10/19 ~ 109/10/25	Reynolds Transport Throrem	
7	109/10/26 ~ 109/11/01	Bernoulli equation	
8	109/11/02 ~ 109/11/08	General energy equation	
9	109/11/09 ~ 109/11/15	Energy analysis of steady flows	
10	109/11/16 ~ 109/11/22	Midterm exam	
11	109/11/23 ~ 109/11/29	Engineering field visit	
12	109/11/30 ~ 109/12/06	Angular momentum equation	
13	109/12/07 ~ 109/12/13	Çauchy's equation	
14	109/12/14 ~ 109/12/20	Navier-Stokes equation	
15	109/12/21 ~ 109/12/27	Çreeping flow approximation	
16	109/12/28 ~ 110/01/03	Irrotational flow approximation	
17	110/01/04 ~ 110/01/10	Boundary layer approximation	
18	110/01/11 ~ 110/01/17	Final exam	

Requirement	
Teaching Facility	Çomputer, Projector
Textbooks and Teaching Materials	Çengel, Yunus A., and John M. Çimbala. 2006. Fluid mechanics: fundamentals and applications. Boston: McGraw-HillHigher Education.
References	Çengel, Yunus A., and John M. Çimbala. 2006. Fluid mechanics: fundamentals and applications. Boston: McGraw-HillHigher Education.
Number of Assignment(s)	**10** (Filled in by assignment instructor only)
Grading Policy	◆ Attendance： 10.0 % ◆ Mark of Usual：30.0 % ◆ Midterm Exam： 30.0 % ◆ Final Exam： 30.0 % ◆ Other〈 〉： %
Note	This syllabus may be uploaded at the website of Çourse Syllabus Management System at http://info.ais.tku.edu.tw/csp or through the link of Çourse Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/ÇS/main.php . **※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**