Tamkang University Academic Year 112, 1st Semester Course Syllabus

Course Title	COMPUTER SIMULATION	Instructor	HUANG-WEN HUANG
Course Class	TEIDB2A DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH-TAUGHT PROGRAM), 2A	Details	◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG3 Good health and well-being for people SDG4 Quality education SDG9 Industry, Innovation, and Infrastructure SDG13 Climate action		

Departmental Aim of Education

Ⅰ. Comprehend professional knowledge.

Ⅱ. Acquire mastery of Practical Skills.

Ⅲ. Establish creative achievement.

Subject Departmental core competences

A. Programming and application ability.(ratio:40.00)

B. Mathematical reasoning ability.(ratio:15.00)

C. Implementing computer systems ability.(ratio:15.00)

D. Computer networking application skills.(ratio:15.00)

E. Professional skills for information technology (IT) industry.(ratio:15.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:30.00)

3. A vision for the future. (ratio:10.00)

4. Moral integrity. (ratio:10.00)

5. Independent thinking. (ratio:10.00)

6. A cheerful attitude and healthy lifestyle. (ratio:10.00)

7. A spirit of teamwork and dedication. (ratio:10.00)

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

Course Introduction	Computer Simulation plays an important role in the area of engineering and science, which can be applied to many kinds of discipline applications such as thermal science, transport phenomena, structures, bio-engineering, etc. This course introduces the application and theoretical background of system simulation. Topics included modeling systems static and dynamics using discrete events, the modeling of different application cases and steps through simulation. A high level simulation package COMSOL will be utilized for the simulation modeling practices.	

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. Cognitive : 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	This course introduces the application and theoretical background of computer simulation, particularly to engineering and science. Theoretical topics include modeling, mesh generation, finite element methods and validation, statistical analysis of output.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDE	12345678	Lecture, Discussion, Experience, Imitation	Testing, Study Assignments, Discussion(including classroom and online), Practicum, Report(including oral and written), Activity Participation

Course Schedule

Week	Date	Course Contents	Note
1	112/09/11 ~ 112/09/17	Syllbus/Course instruction	
2	112/09/18 ~ 112/09/24	Concept of modeling and simulation	

3	112/09/25 ~ 112/10/01	What is Simulation?	
4	112/10/02 ~ 112/10/08	Fundamental simulation concept	
5	112/10/09 ~ 112/10/15	A guided tour through COMSOL	
6	112/10/16 ~ 112/10/22	Case study 1	
7	112/10/23 ~ 112/10/29	1.Modeling basic operations and inputs 2. Enterprise visiting	
8	112/10/30 ~ 112/11/05	1. Modeling detailed operations 2. Enterprise visiting	
9	112/11/06 ~ 112/11/12	Midterm Exam Week	
10	112/11/13 ~ 112/11/19	Case study 2	
11	112/11/20 ~ 112/11/26	Results analysis of output from terminating simulations	
12	112/11/27 ~ 112/12/03	Case study 3	
13	112/12/04 ~ 112/12/10	Steady-state and dynamic analysis	
14	112/12/11 ~ 112/12/17	Discussing group study	
15	112/12/18 ~ 112/12/24	Selecting topic	
16	112/12/25 ~ 112/12/31	group presentation	
17	113/01/01 ~ 113/01/07	Final Exam Week	
18	113/01/08 ~ 113/01/14	Flex week, learning activities should be arranged.	

Key capabilities	
Interdisciplinary	
Distinctive teaching	
Course Content	Computer programming or Computer language (students have hands-on experience in related projects)

Requirement	1.Each study group will present the designated textbook examples briefing in sequence. 2.The presentation should be carried out step by step to show the detailed information of the example, which can be in the form of video, animation, or powerpoint text. 3.All members of each group are not allowed to be absent during the group presentation. 4.The presentation score is assessed by all the student of the class and teacher.
Textbooks and Teaching Materials	Self-made teaching materials:Presentations, Handouts Using teaching materials from other writers:Videos Name of teaching materials: https://www.comsol.com/
References	
Grading Policy	◆ Attendance： 10.0 ％ ◆ Mark of Usual：30.0 ％ ◆ Midterm Exam： 20.0 ％ ◆ Final Exam： 20.0 ％ ◆ Other〈project〉：20.0 ％
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php . **※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**