Tamkang University Academic Year 112, 2nd Semester Course Syllabus

Course Title	ENERGY AND MATERIALS TECHNOLOGIES	Instructor	CHAO-TSAI HUANG
Course Class	TNUZB0B GLOBAL TECHNOLOGY REVOLUTION, 0B	Details	◆ General Course ◆ Required ◆ One Semester
Relevance to SDGs	SDG4 Quality education SDG7 Affordable and clean energy SDG11 Sustainable cities and communities SDG12 Responsible consumption and production		

Departmental Aim of Education

Students will understand recent development of modern science and technology and its impact on human society and global environment. Through the design of course students will also be familiar with broadly-based fundamental technical knowledge and improve.

Subject Schoolwide essential virtues

1. A global perspective. (ratio:20.00)
2. Information literacy. (ratio:10.00)
3. A vision for the future. (ratio:20.00)
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	The goal of this course is to discuss the energy sources, energy use, and energy technology. Both non-renewable and renewable energies are addressed. Moreover, the environmental impact of fossil-fuel consumption is also emphasized.

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	Learn about where the energy comes from and where it can be used.	Cognitive
2	To understand what the energy technologies are.	Cognitive
3	To study what the non-renewable energies and renewable energies are.	Cognitive
4	To learn what the relationship between energy and the environment is.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1		123	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)
2		1235	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)
3		123456	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)
4		12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)

Course Schedule

Week	Date	Course Contents	Note
1	113/02/19 ~ 113/02/25	Introduction to energy resource and environment	
2	113/02/26 ~ 113/03/03	The nature of energy	
3	113/03/04 ~ 113/03/10	Fossil fuels and thermal power (1)	

4	113/03/11 ~ 113/03/17	Fossil fuels and thermal power (2)	
5	113/03/18 ~ 113/03/24	Solar energy and related technology	
6	113/03/25 ~ 113/03/31	Wind energy and related technology	
7	113/04/01 ~ 113/04/07	Geothermal energy and related technology	
8	113/04/08 ~ 113/04/14	Ocean energy and hydropower (1)	
9	113/04/15 ~ 113/04/21	Midterm Exam Week	
10	113/04/22 ~ 113/04/28	Ocean energy and hydropower (2)	
11	113/04/29 ~ 113/05/05	Biomass energy and related technology (1)	
12	113/05/06 ~ 113/05/12	Biomass energy and related technology (2)	
13	113/05/13 ~ 113/05/19	Fuel cell and related technology (1)	
14	113/05/20 ~ 113/05/26	Fuel cell and related technology (2)	
15	113/05/27 ~ 113/06/02	Hydrogen energy	
16	113/06/03 ~ 113/06/09	Energy and environment	
17	113/06/10 ~ 113/06/16	Final Exam Week (Date:113/6/11-113/6/17)	
18	113/06/17 ~ 113/06/23	Flex week, discuss about ESG issues around the world	

Key capabilities	
Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)
Distinctive teaching	
Course Content	Environmental Safety Green Energy Sustainability issue

Requirement	
Textbooks and Teaching Materials	Using teaching materials from other writers:Textbooks Name of teaching materials: Weixin Chen (陳維新), An Introduction to Energy, Gau Lih Books, Co. Ltd, 10th edition (2022)
References	Richard A. Dunlap, Sustainable Energy, 2th Edition
Grading Policy	◆ Attendance： 10.0 % ◆ Mark of Usual： % ◆ Midterm Exam： 30.0 % ◆ Final Exam： 40.0 % ◆ Other〈Homework〉：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.**