Tamkang University Academic Year 113, 1st Semester Course Syllabus

Course Title	INTRODUCTION TO BIOTECHNOLOGY	Instructor	LIAO, SHU-CHUAN
Course Class	TEDXB1A DEPARTMENT OF CHEMICAL AND MATERIALS ENGINEERING, 1A	Details	◆ General Course ◆ Selective ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education		

Departmental Aim of Education

Education Objectives: Cultivation of chemical/materials engineering experts possessing professional knowledge, skills, and literacy.

Subject Departmental core competences

A. Qualified basic and core knowledge of chemical/materials engineering.(ratio:5.00)

B. Qualified capabilities to conduct chemical/materials engineering experiments and analyze experiment results.(ratio:5.00)

C. Qualified capabilities to use the techniques and tools for solving chemical/materials engineering problems.(ratio:25.00)

D. Qualified capability to analyze and design the components, processes, and systems of chemical/materials engineering.(ratio:25.00)

E. Qualified capability to manage and integrate cross-field projects and to communicate and cooperate with team members.(ratio:5.00)

F. Qualified capability to explore, analyze, and handle engineering problems while considering sustainable development.(ratio:5.00)

G. Comprehend contemporary issues and understand the interplay between chemical/materials engineering technologies, environmental sustainability, and societal cultural well-being, and develop the capability and habits of lifelong learning.(ratio:15.00)

H. Understand professional information ethics and social responsibility for chemical/materials engineers.(ratio:15.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:5.00)

3. A vision for the future. (ratio:15.00)

4. Moral integrity. (ratio:25.00)

5. Independent thinking. (ratio:30.00)

6. A cheerful attitude and healthy lifestyle. (ratio:5.00)

7. A spirit of teamwork and dedication. (ratio:5.00)

8. A sense of aesthetic appreciation. (ratio:5.00)

Course Introduction	The course presents an introduction to the historical background aspects of biotechnology. Our discussion points include food, human health, and environmental problems.

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	The students will be able to understand the basic concepts and principles of the application of biotechnology and realize the influence of these advanced technologies and their potential impacts on future life. Guide students in learning the principles and applications of biotechnology.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDEFGH	12345678	Lecture, Discussion	Testing, Discussion(including classroom and online), Report(including oral and written)

Course Schedule			
Week	Date	Course Contents	Note
1	113/09/09 ~ 113/09/15	Modern Biotechnology(I)	
2	113/09/16 ~ 113/09/22	Modern Biotechnology(II)	
3	113/09/23 ~ 113/09/29	Introduction to genes and genomes	
4	113/09/30 ~ 113/10/06	DNA: the molecule of life	
5	113/10/07 ~ 113/10/13	Recombinant DNA technology and genomics	
6	113/10/14 ~ 113/10/20	Protein as product	
7	113/10/21 ~ 113/10/27	Medical Biotechnology(I)	
8	113/10/28 ~ 113/11/03	Medical Biotechnology(II)	
9	113/11/04 ~ 113/11/10	Midterm Exam/Midterm Assessment Week (teachers can adjust the week as needed)-Book report	
10	113/11/11 ~ 113/11/17	Ethics and Biotechnology	
11	113/11/18 ~ 113/11/24	Applications of Biotechnology: Human therapeutics	
12	113/11/25 ~ 113/12/01	Applications of Biotechnology:Agriculture	
13	113/12/02 ~ 113/12/08	Final oral presentation(I)	
14	113/12/09 ~ 113/12/15	Final oral presentation(II)	
15	113/12/16 ~ 113/12/22	Final oral presentation(III)	
16	113/12/23 ~ 113/12/29	Final oral presentation(IV)	
17	113/12/30 ~ 114/01/05	Final Exam/Final Assessment Week (teachers can adjust the week as needed)	
18	114/01/06 ~ 114/01/12	Flexible Teaching Week: Generally, no in-person classes; teachers may arrange teaching activities or final assessments, among other options.	
Key capabilities			
Interdisciplinary			

Distinctive teaching	
Course Content	Logical Thinking Environmental Safety Green Energy
Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Handouts
References	Introduction to Biotechnology, 4/e (GE-Paperback) William J. Thieman , Michael A. Palladino
Grading Policy	◆ Attendance： 10.0 % ◆ Mark of Usual： % ◆ Midterm Exam： 30.0 % ◆ Final Exam： 40.0 % ◆ Other〈Classwork〉：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.**