

Course Syllabus

開 課 學 期	107-2	部 別	<input type="checkbox"/> 日間部 <input checked="" type="checkbox"/> 進修部
系 科	通識教育中心	學 制	大學部
課 程 名 稱	生物技術的應用 Application of biotechnology	授 課 教 師	林榮芳
課 程 類 別	選修	開 課 班 級	博學涵養 <input type="checkbox"/> 人文 <input checked="" type="checkbox"/> 自然
學 分 數	2	授 課 時 間	二 1 2
科 目 代 碼		辦 公 地 點	1317
開 課 代 號		請 益 時 間	

課程描述

Course Description

介紹生物技術的基本原理與在農業與醫學方面的應用，透過課程講解與影片播放，使學生具備生物技術的概念，同時瞭解實務的應用以及遇到生技產品的廣告時，可有初步概念以供判斷。

Introduce the basic principle of the biological technology and the application in agriculture and medicine, let students study the basic concept of biotechnology through powerpoint and movie express. In addition, let students understand how to judge the biotechnical products.

課程目標

Course Objectives

認知：介紹生物技術的基本原理與在農業與醫學方面的應用，使學生具備生物技術的概念

Introducing basic principles of the biotechnology in the agricultural and medicine aspect and their application, let the students have the concepts of biotechnology

情意：具備生物技術的基礎概念與發展方向

Let students learn the basic concepts and developments of biotechnology.

技能：具備對生技產品的瞭解與判斷能力

Let students have the ability to judge the biotechnical products

一般能力/專業能力

General/Core Learning Outcomes

一般能力

一、人文與思維

- 1、能瞭解人文、社會科學的基本概念與理論。
- 2、能基於人文、社會學的基礎認識，將此知識解釋人文社會的現象，並舉例說明。
- 3、能在生活中運用人文、社會學的知識，思辨、分析、批判探討人類與社會現象。
- 4、能覺知人文涵養教育所引發的心靈感動，欣賞、體悟多元文化與人文內涵之美。

二、內省與關懷

- 1、能進行內觀反省，了解自己的優、缺點，並據此作出適當的行為。
- 2、能藉由內觀反省，了解周遭人的感受，對群己、環境主動表現出關懷。
- 3、能對群己、環境的關懷產生價值感，成為態度。
- 4、能具有持久且一致主動關懷環境、群己，推己及人的品格。

三、創意與表達

- 1、能有效運用口頭語言、書面文書清楚表達自己的想法和他人的意見。
- 2、能運用適當工具與方式表述資料，且表述的內容論述與結構皆完整。

3、能有創意的表述，並清楚傳達自己的想法。

4、表述的內容具有獨創見解，並與接收者可以進行有效的溝通與論辯。

四、科學與邏輯

1、能認識科學方法與科學精神的基本論述及主要內涵。

2、能運用多種思考方法，思索事務變化的因果和形式，探討事物間邏輯性關聯。

3、能依據邏輯推理原則，進行批判性思考。

4、能運用邏輯推理、批判性思辨能力，運用於生活與工作之中。

評量標準

Assessment standards

<input type="checkbox"/> 期中考試 _____ %	<input type="checkbox"/> 期中報告 <u>50</u> %	<input type="checkbox"/> 平時考 _____ %
<input type="checkbox"/> 期末未試 _____ %	<input type="checkbox"/> 期末報告 <u>50</u> %	<input type="checkbox"/> 上課參與度 _____ %
<input type="checkbox"/> 出席 _____ %	<input type="checkbox"/> 口頭報告 _____ %	<input type="checkbox"/> 其它 _____ %

教科書 (書名、作者、出版社、備註)

Textbook (Title, Author, Publisher, Remarks)

書名 Title	作者 Author	出版社 Publisher	備註 Remarks

參考書目 (書名、作者、出版社、期刊、備註)

Reference Materials (Title, Author, Publisher/Journal, Remarks)

書名 Title	作者 Author	出版社/期刊 Publisher/Journal	備註 Remarks
1. Cell and Tissue Culture for Medical Research.	Ed. A. Doyle and J. B. Griffiths.	Wiley.	
2. 組織培養的技術.	郭榮烈等人編譯.	藝軒出版社.	

授課進度

Course Schedule

週次 Week	科目主題 Course Subject	教學方式 Teaching Method	授課進度 Course Schedule
1	遺傳與疾病的關係	powerpoint 內容講解	
2	遺傳與疾病的關係	影片欣賞	學生報告
3	基因變異與疾病的關連	powerpoint 內容講解	學生報告
4	基因變異與疾病的關連	影片欣賞	學生報告
5	農藝作物對人類的重要性 (觀賞用經濟作物)	powerpoint 內容講解	學生報告
6	農藝作物對人類的重要性 (食用性經濟作物)	powerpoint 內容講解	學生報告
7	生物技術的介紹	powerpoint 內容講解	學生報告
8	生物技術的原理與應用 (I): 細胞培養	powerpoint 內容講解	學生報告
9	期中考試		學生報告

10	生物技術的原理與應用 (I): 組織培養	powerpoint 內容講解	學生報告
11	生物技術的原理與應用(II): 細胞融合 (體細胞雜交)	powerpoint 內容講解	學生報告
12	生物技術的原理與應用(III): 疫苗的製備與應用	powerpoint 內容講解	學生報告
13	生物技術的原理與應用 (IV): 植物的基因轉殖 I	powerpoint 內容講解	學生報告
14	生物技術的原理與應用 (IV): 植物的基因轉殖 II	powerpoint 內容講解	學生報告
15	生物技術的原理與應用 (V): 動物的基因轉殖 I	powerpoint 內容講解	學生報告
16	生物技術的原理與應用 (VI): 動物的基因轉殖 II	powerpoint 內容講解	學生報告
17	綜合討論		
18	綜合討論		

科目主題對應一般能力/專業能力之涵蓋率 (填寫說明)

Coverage Rate of the Course Subject Correspond to the Ordinary Ability and Professional Ability

科目主題	能力指標涵蓋率%									
	專業能力%					一般能力%				
	1	2	3	4	5	1	2	3	4	
主題一 遺傳與疾病	/	/	/	/	/	10		10	80	
主題二 農作物對人類的影響	/	/	/	/	/	10	30	10	50	
主題三 生物技術對疾病的應用	/	/	/	/	/	10	30	10	50	
主題四 生物技術對農作物改良的重要性							30	30	40	

專業能力說明

通識課程以訓練一般能力為主軸

一般能力說明

- 1.人文與思維
- 2.內省與關懷
- 3.創意與表達
- 4.科學與邏輯

Central Taiwan University of Science and Technology

Course Syllabus

Academic Year/Semester	107/2	Day/Night School	Night School
Department	Optometry	Program	Undergraduate
Course Title	Application of biotechnology	Instructor	Rong-Fong Lin
Course type	Elective Technology	Class	Nature
Credit Hour	2	Hour(s)	Tuesday 1,2
Course Code		Office	1317
Subject Code		Advisory Time	

Course Description

Introduce the basic principle of the biological technology and the application in agriculture and medicine, let students study the basic concept of biotechnology through powerpoint and movie express. In addition, let students understand how to judge the biotechnical products.

Course Objectives

Cognitive : Introducing basic principles of the biotechnology in the agricultural and medicine aspect and their application, let the students have the concepts of biotechnology
Affection : Let students learn the basic concepts and developments of biotechnology.
Skill : Let students have the ability to judge the biotechnical products

General/Core Learning Outcomes

Genera Learning Outcomes

I. Humanism and thinking

1. Can comprehend the basic concepts and theories of humanistic and social sciences.
2. Can use the knowledge acquired from humanistic and social sciences to explain and illustrate humanistic and social phenomena.
3. Can use the knowledge of humanistic and social sciences to discern, analyze, and criticize human and social phenomena in daily life.
4. Can perceive the emotional blast triggered from humanistic nurture and appreciate the beauty of multiple cultures and humanistic spirit.

II. Reflection and care

1. Can reflect upon oneself, know one's good and bad qualities and thereby act accordingly.
2. Can empathize with people around them through one's reflection, and show their care towards others and the environment.
3. Can create a sense of value and thereby form a positive attitude from their care towards others and the environment.
4. Can become empathetic towards others and develop a virtuous character that cares for others and their environment in an active manner.

III. Creativity and expression

1. Can express oneself or others' opinions in a clear and effective manner, through oral or written presentation.
2. Can use proper tools and methods to verbalize data and produce a logical and organized content.
3. Can convey one's ideas in an original and lucid manner.
4. Can produce insightful thoughts and make effective communication or arguments with the audience.

IV. Science and logic

1. Can comprehend the basic discourse and major contents of scientific spirit and method.
2. Can exercise multiple thinking methods to ponder on the cause and format of issues and explore their correlations.
3. Can make critical thinking based on logical principles.
4. Can apply one's logical rationalization and critical thinking to their everyday life and work.

Assessment standards

Interim report: 50%

Final report: 50%

Textbook (Title, Author, Publisher, Remarks)

Title	Author	Publisher	Remarks

Reference Materials (Title, Author, Publisher/Journal, Remarks)

Title	Author	Publisher/ Journal	Remarks
1. Cell and Tissue Culture for Medical Research	Ed. A. Doyle and J. B. Griffiths	Wiley	
2. 組織培養的技術.	郭榮烈等人編譯.	藝軒出版社.	

Course Schedule

Week	Course Subject	Teaching Method	Course Schedule
1	Relationship between genetics and diseases	Using powerpoint files	
2	Relationship between genetics and diseases	Teaching using movies	Reports of students
3	Relationship between genetics and diseases	Using powerpoint files	Reports of students
4	Relationship between genetic variation and diseases	Teaching using movies	Reports of students
5	Importance of agriculture for human beings (Ornamental plants)	Using powerpoint files	Reports of students
6	Importance of agriculture for human beings (Food plants)	Using powerpoint files	Reports of students
7	Introduction of Biotechnology	Using powerpoint files	Reports of students
8	Principles and application of Biotechnology (I): Cell culture	Using powerpoint files	Reports of students
9	Principles and application of Biotechnology (I): Cell culture	Using powerpoint files	Reports of students
10	Principles and application of Biotechnology (II): Tissue culture	Using powerpoint files	Reports of students
11	Principles and application of Biotechnology (III): Somatic	Using powerpoint files	Reports of students

	hybridization										
12	Principles and application of Biotechnology (IV): Preparation and application of vaccines	Using powerpoint files	Reports of students								
13	Principles and application of Biotechnology (V): Transformation of plants I	Using powerpoint files	Reports of students								
14	Principles and application of Biotechnology (V): Transformation of plants II	Using powerpoint files	Reports of students								
15	Principles and application of Biotechnology (V): Transformation of animal cells I	Using powerpoint files	Reports of students								
16	Principles and application of Biotechnology (V): Transformation of animal cells II	Using powerpoint files	Reports of students								
17	Comprehensive discussion										
18	Comprehensive discussion										
Coverage Rate of the Course Subject Correspond to the Ordinary Ability and Professional Ability											
Course Subject	Learning Outcomes %										
	Core %						General %				
	1	2	3	4	5		1	2	3	4	
Topic 1 Genetics and diseases	/	/	/	/	/		10		10	80	
Topic 2 Effects of horticulture on human beings	/	/	/	/	/		10	30	10	50	
Topic 3 Application of biotechnology for the diseases	/	/	/	/	/		10	30	10	50	
Topic 4 Importance of biotechnology on horticultural improvement								30	30	40	
	/	/	/	/	/						
	/	/	/	/	/						
Core Learning Outcomes						General Learning Outcomes					
						1. Humanities and Cogitation 2. Introspection and Solicitude 3. Creativity and Utterance 4. Science and Logic					