

Course Syllabus

開課學期	107-2	部別	<input checked="" type="checkbox"/> 日間部 <input type="checkbox"/> 進修部
系科	通識教育中心	學制	大學部
課程名稱	生命的奧秘	授課教師	張文馨
課程類別	選修	開課班級	<input checked="" type="checkbox"/> 博學涵養 <input type="checkbox"/> 人文 <input checked="" type="checkbox"/> 自然
學分數	2	授課時間	W5 1~2 節
科目代碼		辦公地點	
開課代號		請益時間	
課程描述 Course Description			
<p>生命如何誕生，現代知識對生命了解多少，生物科技又面臨那些問題。生物科技是二十一世紀的明星產業，人們的生活與生物科技息息相關。本課程將從基礎的生命科學相關知識延伸到生物科技的應用，以期學生們能對生命與科技議題有更深的認識。</p>			
課程目標 Course Objectives			
<p>認知：能歸納生命運作之基礎理論及生物科技之應用範籌。 情意：能認識當代生物科技並對其所衍生之議題具判斷力。 技能：能具備闡述生命運作基礎理論之能力。</p>			
一般能力/專業能力 General/Core Learning Outcomes			
<p>一般能力</p> <p>人文與思維</p> <ol style="list-style-type: none"> 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。 <p>內省與關懷</p> <ol style="list-style-type: none"> 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。 <p>創意與表達</p> <ol style="list-style-type: none"> 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、能有創意性的表述，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。 <p>四、科學與邏輯</p> <ol style="list-style-type: none"> 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 checked="" type="checkbox"/> 期中報告 <u>35</u> %	<input type="checkbox"/> 平時考 _____ %
<input type="checkbox"/> 期末未試 _____ %	<input checked="" type="checkbox"/> 期末報告 <u>35</u> %	<input checked="" type="checkbox"/> 上課參與度 <u>15</u> %
<input checked="" type="checkbox"/> 出席 <u>15</u> %	<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
自編教材			

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
Biology: Exploring Life	Neil A. Campbell, Brad Williamson, Robin J. Heyden	Pearson Prentice Hall	
生命之源：能量、演化與複雜生命的起源	尼克·連恩	貓頭鷹出版社	

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	課程簡介	投影片教學、討論 分享、短片賞析	簡介
2	什麼是生命？ - 生命的起源	投影片教學、討論 分享、短片賞析	生命的起源
3	什麼是「活著」？ - 生命的定義	投影片教學、討論 分享、短片賞析	生命的起源
4	當個創世神 - 談人造病毒、人造細菌	投影片教學、討論 分享、短片賞析	生命的起源
5	複雜生命如何產生 - 生命與演化	投影片教學、討論 分享、短片賞析	生命的起源
6	細胞介紹 - 繁殖與週期	投影片教學、討論 分享、短片賞析	生命的維持
7	幹細胞在幹嗎？ - 你要存臍帶血嗎？	投影片教學、討論 分享、短片賞析	生命的維持
8	長生不老的秘密 - 生命時鐘	投影片教學、討論	生命的維持

		分享、短片賞析	
9	期中書面報告	書面報告	期中考核
10	生命大改造 - 談基因工程	投影片教學、討論 分享、短片賞析	生命改造與相關議題
11	生命字典 - 基因體解碼	投影片教學、討論 分享、短片賞析	生命改造與相關議題
12	誰的「生命藍圖」- 基因剪輯 議題：你想訂製生命嗎？	投影片教學、討論 分享、短片賞析	生命改造與相關議題
13	身外化身 - 生命複製	投影片教學、討論 分享、短片賞析	生命改造與相關議題
14	複製人電影逃出惡魔島導讀 - 你想複製自己嗎？	投影片教學、討論 分享、短片賞析	生命改造與相關議題
15	生命大滅絕 - 談生物多樣性	投影片教學、討論 分享、短片賞析	生物與環境
16	蝴蝶效應 - 人類與環境的相 互影響	投影片教學、討論 分享、短片賞析	生物與環境
17	分組報告與討論	討論分享	期末考核
18	分組報告與討論	討論分享	期末考核

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	
生命的起源	/	/	/	/	/	25%	25%	50%	50%	
生命的維持	/	/	/	/	/	25%	25%	25%	75%	
生命的改造	/	/	/	/	/	25%	50%	50%	75%	
生物與環境	/	/	/	/	/	25%	50%	75%	50%	

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	Day School
Department	General Education	Program	
Course Title	The mystery of life	Instructor	Wen-Shin Chang
Course type	Elective	Class	W5 1~2
Credit Hour		Hour (s)	2
Course Code		Office	
Subject Code		Advisory Time	
Course Description			
Biotechnology is the star industry in the 21st century. People's life is closely related to biotechnology. This course will extend from basic life science related knowledge to biotechnology so that students can understand biotechnology and science applications.			
Course Objectives			
This course is intended to introduce the life science from cell to organism, and the role of life in the biosphere and lead students interested in life science.			
General/Core Learning Outcomes			
General 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

Midterm (30%) · Final exam (30%) · Oral Presentation (20%) · Attendance (10%) · Discussion (10%)

Textbook (Title, Author, Publisher, Remarks)

Title	Author	Publisher	Remarks
The teaching materials and PPT files to explain, students discuss in class and oral report			

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

Title	Author	Publisher/ Journal	Remarks
Biology: Exploring Life	Neil A. Campbell, Brad Williamson, Robin J. Heyden	Pearson Prentice Hall	

Course Schedule

Week	Course Subject	Teaching Method	Course Schedule
1	Summary Guidance of the Course	Lectures and Discussion	Origins of life
2	What is life? - Origin of Life	Lectures and Discussion	Origins of life
3	What is "alive"? - the definition of life	Lectures and Discussion	Origins of life
4	Being a Creator - Talk about the man-made virus, artificial bacteria	Lectures and Discussion	Origins of life
5	How to Produce Complex Life - Life and Evolution	Lectures and Discussion	Origins of life
6	Cell Introduction - Replication and cell cycle	Lectures and Discussion	Maintenance of life
7	Stem cells are doing? - You want to save umbilical cord blood?	Lectures and Discussion	Maintenance of life
8	Immortal secret - life clock	Lectures and Discussion	Maintenance of life
9	Midterm report	Lectures and	Midterm report

		Discussion	
10	Big Transformation of Life - On Genetic Engineering	Lectures and Discussion	Transformation of life
11	Dictionary of Life - Genome decoding	Lectures and Discussion	Transformation of life
12	Whose "Blueprint of Life" - Gene editing	Lectures and Discussion	Transformation of life
13	Do you want to order life? Survival - Copy of life	Lectures and Discussion	Transformation of life
14	Escape Alcatraz Island - Do you want to copy yourself?	Lectures and Discussion	Transformation of life
15	Great Extinction of Life - Talking about Biodiversity	Lectures and Discussion	Biology and Environment
16	Butterfly Effect - The Interaction between Human and Environment	Lectures and Discussion	Biology and Environment
17	Oral Discussion and Presentation	Discussion	Discussion
18	Oral Discussion and Presentation	Discussion	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	
Origins of life	/	/	/	/	/	25%	25%	50%	50%	
Maintenance of life	/	/	/	/	/	25%	25%	25%	75%	
Transformation of life	/	/	/	/	/	25%	50%	50%	75%	
Biology and Environment	/	/	/	/	/	25%	50%	75%	50%	

Core Learning Outcomes

General Learning Outcomes

1. Humanities and Cogitation
2. Introspection and Solicitude
3. Creativity and Utterance
4. Science and Logic