文藻外語大學111學年度第2學期教學綱要
Wenzao Ursuline University of Languages
Syllabus for the 2nd Semester of the 2022 Academic Year

「遵守智慧財產權觀念、不非法影印」

Please comply with intellectual property laws. Do not make illegal copies of copy-righted materials.

壹、課程基本資料

課程名稱 Course Title	跨科技整合與應用 INTERDISCIPLINARY TECHNOLOGIES AND APPLICATIONS			
課程類別 (學制) School System	日間部四技 4-Year College of Day Division			
開課單位 Academic Unit	通識教育中心			
授課教師 Instructor	章之平	職稱 Academic Rank	助理教授	
師生互動 Data of Instructor	辦公室 Office	https://line.me/R/ti/g/JglSAVI8tc	辦公室電話 Office Phone Number	0930763333
	電子信箱 E-mail	chang_chih_ping@hotmail.com		
	約談時間 Office Hours	Please make appointment with your teacher.		
學分 Credits	2.0學分	選課別 Category	【∨】必修Required Course 【 】選修Elective Course	
開課類別 Course Length	【 】學年課 Year-long course(2 semesters) 【∨】學期課 semester course(1 semester)		開課年級Year Taught：3年級 授課班級Class Taught：日四技通識課程三	
課程內容概要 Course Content Synopsis	■課程內容概要本課程將結合物理、化學、生物等相關科學的基礎知識，深入淺出地介紹當前熱門的跨領域科學的研究。基於傳統研究方法無法有效解決現今在類型、規模和難度上都有巨大不同的問題，於是跨科學研究是二十一世紀一個必要且重要的發展趨勢。跨科學研究是指需要兩個或兩個以上專業(或學科)的基本知識和能力的研究領域，例如，奈米科技、生醫科學應用、尖端材料、尖端電子及光電科技、儲存與顯示技術、網際網路技術等。本課程欲藉由跨領域應用科學的研究介紹，幫助學生了解人類當今所面臨能源短缺、資源短缺、環境污染、疾病預防與治療等相關重大課題，與有效解決的方法。此外，在課堂內容中也將幫助學生了解台灣如何透過跨領域的整合研究以促進台灣科技產業現代化，以為學生未來進入就業職場做準備。 Nowadays, it requires researches or activities which combine two or more academic disciplines to solve the complex problems that we face today. In recent years, this type of work is called an interdisciplinary approach and one of the hottest scientific methods. The epidemiological diseases or global warming need to integrate and connect diverse disciplines, for instance, biology, chemistry, geography, and physics to investigate these extremely complex issues. Many modern technologies, such as nanotechnology, electro-optical science, biomaterials science, and green technology, are categorized as interdisciplinarity. In this course,			

	many currently emerging technologies will be covered, including 3D printing, nanotechnology, display technology, medical therapies, technology of data storages, and biochips technology, etc. Moreover, a field trip to visit Pingtung Biotechnology Park will be arranged to help students gain more information and understanding for the development of the Taiwanese industry. ■主要授課語言: 英語(English)
課程學習目標 Course Learning Goals	一、使同學認識跨科學研究的領域並瞭解其中的基本科學理論知識。 二、讓同學瞭解跨領域科技在日常生活中應用的情形。 三、讓同學瞭解跨領域科技如何解決現今所面臨的問題，與改變人類的生活方式。 四、激發同學思考跨領域科技可能造成的負面效應。 五、幫助學生在建立跨科學的基本知識與概念後，增進閱讀科技報導的興趣。 六、透過認識科技、善用科技幫助學生建立現代人必須具備之基本素養。 七、提升同學求職的競爭力。 一、Build up some basic knowledge of biology, chemistry, and physics. 二、Identify what interdisciplinary researches are and their applications. 三、Know how interdisciplinary technologies can solve the complex problems and affect our societies. 四、Discuss the pros and cons of the interdisciplinary technology. 五、Enhance students' abilities and raise their interests to read technology-related reports. 六、Develop fundamental science-knowledge to live in modern society. 七、Promote students' competencies for getting jobs.

系培育目標與核心能力以及學習目標 Development Goals, Skill Indicator, & Learning Objectives	系培育目標 Development Goal	核心能力指標編碼 Skill Indicator Code	核心能力 Skill Indicator	學習目標 Learning Objective
	1.自主管理能力	1-3-2	自主學習能力	
	1.自主管理能力	1-3-3	反思能力	
	1.自主管理能力	1-3-4	生涯規劃能力	
	2.問題解決能力	2-3-1	問題解決能力	
	2.問題解決能力	2-3-3	面對挑戰能力	
	2.問題解決能力	2-3-4	創新思維能力	
	3.倫理實踐能力	3-3-3	環境保護能力	

	3.倫理實踐能力	3-3-4	學習多元文化能力	
	4.美學素養能力	4-3-3	美的保護能力	
	4.美學素養能力	4-3-4	生命的感受能力	
	5.分析綜合能力	5-3-4	跨領域整合能力	
	6.有效溝通能力	6-3-4	自我肯定	
	7.建立關係能力	7-3-1	團隊合作能力	
	8.答覆使命能力	8-3-1	社會關懷能力	
	8.答覆使命能力	8-3-2	敬業的工作態度	
	其他(Others)			

學生先備知能 Prerequisite Knowledge Skills	Students need to be able to search websites and read journals individually. Also, strongly recommend passing English L5 before the class.
教學學理基礎 Theoretical Foundation of Instruction	This class uses the flow learning method and natural experience as the theoretical foundation. Article reading and organizing are also implied in this class.
授課資訊 Instructional Information	■課程類型(Top Down)
	一般課程(Regular course) 深碗課程(Deep-bowl course) 跨領域課程(Cross-disciplinary) 創新教學課程(Innovation teaching course) 融入生命教育議題課程(Life education)
	■教學平台
	實體教學(Face-to-face instruction)
	■主要教學策略
	講授(Lecture) 體驗(Experience) 自主學習(Learning autonomy) 校外參訪(Off-campus visits) 分組討論(Group discussion) 個案研究(Case study) 影片欣賞(Video appreciation)
評量 Student Assessm	■評量方式與評分比例分配 Evaluation Criteria

ent	Average marks (Homeworks, attendance, and attitude) 20 % midterm report 40 % final presentation 40 % 1. All the students must hand in the midterm report (group paper report). 2. To encourage self-learning, students who attend certain exhibitions or field trips mentioned in class will receive full points in average marks. Otherwise, you must hand in keywords research reports at least twice with google search results and your own opinions. 3. Students who attendance of the environmental education activities (Sika deer camp) on April 22-23 in KTNP, could replace the final presentation.
	■課堂要求 Course Requirements & Policies
	1. group discussion 2. field trip 3. keywords research Cellphone is forbidden in class. Absence must ask for leaving following school order. Midterm reports and final presentations must hand in on time and based on the prescribed guideline. Otherwise, it goes to zero point. The regulations of your report will be announced in the class.
教材 Learning Materials	「請學生務必使用正版教科書」Please respect copyright and use original textbooks. ■教科書 Textbooks
	1、書名：從搖籃到搖籃Cradle to cradle 作者：威廉麥唐諾、麥克布朗嘉 出版社：遠足文化事業 出版年： ISBN： 教材類型： 2、書名：氣候變遷地圖 作者：柯斯汀 陶，托馬斯 唐尼 出版社：聯經出版 出版年： ISBN： 教材類型： 3、書名：DNA 生命的秘密 作者：詹姆斯.華生 出版社：時報出版 出版年： ISBN： 教材類型： 4、書名：學蜘蛛人趴趴走受大自然啟發的仿生科技 作者：Peter Forvbes 出版社：遠流出版社 出版年： ISBN： 教材類型： 5、書名：上帝的魔法箱--100種最危險的生物 作者：Jeanne K Hanson 出版社：允晨文化 出版年： ISBN： 教材類型：
	■參考書目或網址 References or Websites

	1、書名：http://nr.stic.gov.tw/ejournal/nscm/v29n10/Embag/724-728.pdf 作者： 出版社： 2、書名：http://www.cabc.org.tw/gbm/HTML/website/about01_105.asp 作者： 出版社： 3、書名：http://gdn.ema.org.tw/newsletter/issue24/a3.pdf 作者： 出版社：
教學用軟體 software	付費軟體Commercial software Microsoft Office PhotoImpact PowerDirector
補充資料 Additional Remark	本科目無相關下載檔案。

貳、課程內容與進度（Course Content & Schedule）

週次 Week	上課日期 Date	單元名稱 Units	授課方式 Instructional Approaches	作業、報告、考試或其它 Assignments, Tests and Others	備註 Remarks
1	112/02/19 ～ 112/02/25	Teacher's personal leaving (will discuss the makeup class later.)			Go to the e-learning, download the class syllabus, and add to the line group.
2	112/02/26 ～ 112/03/04	National holiday (no class)	ppt, class Q&A, internet search	keyword search, homework	
3	112/03/05 ～ 112/03/11	Introduction The island you live on-- Taiwan	ppt, class Q&A, internet search, news		https://www.windenergy-asia.com/zh-tw/index.html 3/8-10 Kaohsiung exhibition center.
4	112/03/12 ～ 112/03/18	Water resource and CO2 (SDG 6,7)	ppt, class Q&A, internet search, news	homework	https://www.nstm.gov.tw/Exhibition.aspx?KeyID=b13dd74b-3ae9-4dc1-ba1d-8f18553bbc91 underwater heritage National science and technology museum
5	112/03/19 ～ 112/03/25	Water resource and CO2 (SDG 6,7)			3/25 (Sat) is the makeup class of 4/3
6	112/03/26 ～ 112/04/01	Biotech and GMO	group discussion, attendance, class Q&A, ppt		https://smartcity.org.tw/smartcity.php 3/30-4/1 Kaohsiung exhibition center.
7	112/04/02 ～ 112/04/08	National holiday Makeup class at 3/25	Campus tour		the same time and classroom.

8	112/04/09 ～ 112/04/15	Green power and city development—Offshore wind power (SDG 7)	group discussion		
9	112/04/16 ～ 112/04/22	Midterm report	individual instruction.	Hand in report in paper form. MUST attendant	Sika deer camp 04/22-23
10	112/04/23 ～ 112/04/29	Before the flood (SDG 13)	Attendance, Video watching, class Q&A, ppt		
11	112/04/30 ～ 112/05/06	Cross-field technology integration of Taiwan industry--reduce plastic (SDG 12)	Attendance, class Q&A, ppt		
12	112/05/07 ～ 112/05/13	The application of color	Attendance, class Q&A, ppt		
13	112/05/14 ～ 112/05/20	Seaspiracy (SDG 10, 14)	Attendance, class Q&A, video	class notes for bonus point.	
14	112/05/21 ～ 112/05/27	The application of color			
15	112/05/28 ～ 112/06/03	Fishing industry—problem and solution (SDG 14)	Attendance, class Q&A, ppt		

16	112/06/04 ～ 112/06/10	Bird migration and window collision.	Oral presentation, group discussion		deadline of final report (electronic form)
17	112/06/11 ～ 112/06/17	Final report			deadline of the final report (paper form)
18	112/06/18 ～ 112/06/24	Final report	Oral presentation, group discussion		deadline for all the homework or bonus report.