

105 學年度第 2 學期校課程委員會議

提案傳閱附件 目錄

傳閱附件 1--107-110 學年度校、院定架構、課程與核心能力之關聯檢核表、 關聯表及院定必修課程中英文摘要	1
傳閱附件 2-1--本校各學院所屬各系(所)課程中英文摘要-農學院.....	11
傳閱附件 2-2--本校各學院所屬各系(所)課程中英文摘要-工學院.....	15
傳閱附件 2-3--本校各學院所屬各系(所)課程中英文摘要-管理學院.....	16
傳閱附件 2-4--本校各學院所屬各系(所)課程中英文摘要-人文暨社會學院	19
傳閱附件 2-5--本校各學院所屬各系(所)課程中英文摘要-國際學院.....	22
傳閱附件 2-6--本校各學院所屬各系(所)課程中英文摘要-獸醫學院.....	23
傳閱附件 3--食品科學系「科技農業組」學士學位學程課程規劃案	27
傳閱附件 4--動物科學與畜產系 106 學年度「產學攜手計畫專班四年制課程」 規劃案.....	55
傳閱附件 5--106 學年度新增設先進材料學士學位學程課程規劃案	78
傳閱附件 6--時尚設計與管理系二技專班課程規劃案	109
傳閱附件 7--農企業管理系馬來西亞境外碩士在職專班課程規劃案	127
傳閱附件 8--觀賞魚專班課程重新規劃案	134
傳閱附件 9--105 學年度第 2 學期教師申請開授通識課程案	151

日間部大學部四年制 【共同必修科目】

「國立屏東科技大學的教育，是以『仁實』為校訓，以專業化、全人化、國際化為教育目標。」

校定共同必修課程共 29 學分，分為下列五項領域課程：

(一) 中國語文能力 (4 學分)

國文領域

說明:四技國文為一學年之課程，上、下學期應修「閱讀與寫作」各 2 學分，全學年共 4 學分。

中文名稱	學分	修別	英文名稱
國文(閱讀與寫作)(1)	2	必	Chinese(Reading and Writing) (1)
國文(閱讀與寫作)(2)	2	必	Chinese(Reading and Writing) (2)

(二) 外國語文能力 (6 學分)

英文領域:英文(4 學分)+英語聽講練習(2 學分)+外語實務(0 學分)

說明:1. 英文：(4 學分)

一年級應修「大一英文(1)」及「大一英文(2)」各 2 學分 2 小時，該 2 門課程各分四級(第一級~第四級)，依四技入學英文成績分級授課，學生應依所分級別程度上課。

2.英語聽講練習：(2 學分)

(1)入學英聽能力測驗未達 80 分者，一年級應修「英語聽講練習 101」及「英語聽講練習 102」各 1 學分 2 小時，該 2 門課程各分三級(A1~A3)，依入學英聽能力測驗成績分級授課，學生應依所分級別程度上課。

(2)入學英聽能力測驗達 80 分以上者，一年級可免修「英語聽講練習 101 及 102」。

3.英檢成績優良免修：

通過全民英檢中高級成績者(或本校「外語實務課程實施要點」所列英語檢定考試同等級成績)，免修「英語聽講練習 101~102」及「大一英文(1)和(2)」。

4.外語實務：(0 學分)

(1)本校四技學生應修讀「外語實務」課程(必修，0 學分，惟不須上課)，通過標準依本校「外語實務課程實施要點」規定辦理，其評分方式為「通過」、「不通過」。

(2)學生於三年級開學前參加二次(進修推廣部一次)具公信力之語言測驗機構舉辦之外語能力測驗仍無法通過「外語實務課程實施要點」所列測驗之一者，得於三年級起修習本校開設之「外語實務訓練(1)」(0 學分)及「外語實務訓練(2)」(0 學分)兩門課程，或繼續參加外語能力檢定測驗。

(3)修習本校開設之「外語實務訓練(1)」及「外語實務訓練(2)」兩門課程及格者視同通過「外語實務」，不及格者應重修該 2 門課程直至及格為止。

(4)「外語實務訓練(1)」未修讀或成績不及格者，不得逕修「外語實務訓練(2)」。

中文名稱	修別	學分	英文名稱
英語聽講練習 101	必	1	English Listening & Speaking Practice 101
英語聽講練習 102	必	1	English Listening & Speaking Practice 102
大一英文(1)(第一級)	必	2	Freshman English (1) (Level 1)
大一英文(1)(第二級)	必	2	Freshman English (1) (Level 2)
大一英文(1)(第三級)	必	2	Freshman English (1) (Level 3)
大一英文(1)(第四級)	必	2	Freshman English (1) (Level 4)
大一英文(2)(第一級)	必	2	Freshman English (2) (Level 1)
大一英文(2)(第二級)	必	2	Freshman English (2) (Level 2)
大一英文(2)(第三級)	必	2	Freshman English (2) (Level 3)
大一英文(2)(第四級)	必	2	Freshman English (2) (Level 4)
外語實務	必	0	Foreign Language Proficiency Test
外語實務訓練(1)	必	0	Remedial Skills for English Learning(1)
外語實務訓練(2)	必	0	Remedial Skills for English Learning(2)

(三) 公民教育-憲法 (2 學分)

中文名稱	學分	修別	英文名稱
憲法	2	必	Constitution

(四) 通識領域 (12 學分) + 通識教育講座 (1 學分)

通識領域分四大類，每門課程各為2學分，四技一年級~三年級應於通識選項課程中，修讀6門通識課程。

各學院修讀類別如下：

- 1、農學院：人文學科(2門)、社會科學(3門)、數理與應用科學(1門)。
- 2、工學院：人文學科(2門)、社會科學(3門)、自然與生命科學(1門)。
- 3、管理學院：人文學科(2門)、社會科學(2門)、自然與生命科學(1門)、數理與應用科學(1門)。
- 4、人文暨社會科學院：人文學科(2門)、社會科學(2門)、自然與生命科學(1門)、數理與應用科學(1門)。
- 5、國際學院：人文學科(2門)、社會科學(3門)、數理與應用科學(1門)。
- 6、獸醫學院：人文學科(2門)、社會科學(3門)、數理與應用科學(1門)。

(1) 第一類：人文學科 (Humanities)

- 歷史與文化
- 文學與藝術
- 哲學與宗教
- 道德判斷與推理

(2) 第二類：社會科學 (Social Sciences)

- 法律與政治
- 社會分析與心理
- 經濟與管理

(3) 第三類：自然與生命科學 (Natural and Life Sciences)

- 自然科學
- 生命科學
- 生物技術
- 環境科學

(4) 第四類：數理與應用科學 (Mathematics and Applied Sciences)

- 數理與邏輯
- 資訊科技
- 應用科學

※ 通識教育講座(1 學分) (畢業前須修畢)

1. 生命體驗與學思歷程
2. 全球化與本土化的互動
3. 人文與科技的對話

(五) 體育領域 (4 學分)

四技一年級上、下學期為原班授課之大一體育；二年級上、下學期則為體育選項(選項內容由體育室依授課教師專長，另行排定。若修讀同課程者，學分不得併計畢業學分)；另有體育特別班，供申請核准之特殊狀況學生修習。

中文名稱	修別	學分	英文名稱
大一體育(1)	必	1	Freshman P.E.(1)
大一體育(2)	必	1	Freshman P.E.(2)
體育選項	必	1	Optional P.E. for Interest
體育(特別班)	必	1	P.E. (Special P. E.)

【不分系所選修科目】

全民國防教育軍事訓練學分列計畢業學分數由各系自行認定。

(一) 軍護領域

全民國防教育軍事訓練

中文名稱	修別	學分	英文名稱
全民國防教育軍事訓練- 防衛動員	選	2	All-out Defense Education Military Training- Defense Mobilization
全民國防教育軍事訓練- 國防科技	選	2	All-out Defense Education Military Training- Defense Technology
全民國防教育軍事訓練- 全民國防	選	2	All-out Defense Education Military Training- Civil defense
全民國防教育軍事訓練- 國防政策	選	2	All-out Defense Education Military Training- National Defense Policies
全民國防教育軍事訓練- 國際情勢	選	2	All-out Defense Education Military Training- International Situations

進修部大學部四年制

【共同必修科目】

「國立屏東科技大學的教育，是以『仁實』為校訓，以專業化、全人化、國際化為教育目標。」

校定共同必修課程共 27 學分，分為下列五項領域課程：

(一) 中國語文能力 (4 學分)

國文領域

說明:四技國文為一學年之課程，上、下學期應修「閱讀與寫作」各 2 學分，全學年共 4 學分。

中文名稱	學分	修別	英文名稱
國文(閱讀與寫作)(1)	2	必	Chinese(Reading and Writing) (1)
國文(閱讀與寫作)(2)	2	必	Chinese(Reading and Writing) (2)

(二) 外國語文能力 (6 學分)

英文領域:英文(4 學分)+英語聽講練習(2 學分)+外語實務(0 學分)

說明:1. 英文：(4 學分)

一年級應修「大一英文(1)」及「大一英文(2)」各 2 學分 2 小時，該 2 門課程各分四級(第一級~第四級)，依四技入學英文成績分級授課，學生應依所分級別程度上課。

2. 英語聽講練習：(2 學分)

(1)入學英聽能力測驗未達 80 分者，一年級應修「英語聽講練習 101」及「英語聽講練習 102」各 1 學分 2 小時，該 2 門課程各分三級(A1~A3)，依入學英聽能力測驗成績分級授課，學生應依所分級別程度上課。

(2)入學英聽能力測驗達 80 分以上者，一年級可免修「英語聽講練習 101 及 102」。

3. 英檢成績優良免修：

通過全民英檢中高級成績者(或本校「[外語實務課程實施要點](#)」所列英語檢定考試同等級成績)，免修「英語聽講練習 101~102」及「大一英文(1)和(2)」。

4. 外語實務：(0 學分)

(1)本校四技學生應修讀「外語實務」課程(必修，0 學分，惟不須上課)，通過標準依本校「[外語實務課程實施要點](#)」規定辦理，其評分方式為「通過」、「不通過」。

(2)學生於三年級開學前參加二次(進修推廣部一次)具公信力之語言測驗機構舉辦之外語能力測驗仍無法通過「[外語實務課程實施要點](#)」所列測驗之一者，得於三年級起修習本校開設之「外語實務訓練(1)」(0 學分)及「外語實務訓練(2)」(0 學分)兩門課程，或繼續參加外語能力檢定測驗。

(3)修習本校開設之「外語實務訓練(1)」及「外語實務訓練(2)」兩門課程及格者視同通過「外語實務」，不及格者應重修該 2 門課程直至及格為止。

(4)「外語實務訓練(1)」未修讀或成績不及格者，不得逕修「外語實務訓練(2)」。

中文名稱	修別	學分	英文名稱
英語聽講練習 101	必	1	English Listening & Speaking Practice 101
英語聽講練習 102	必	1	English Listening & Speaking Practice 102

中文名稱	修別	學分	英文名稱
大一英文(1)(第一級)	必	2	Freshman English (1) (Level 1)
大一英文(1)(第二級)	必	2	Freshman English (1) (Level 2)
大一英文(1)(第三級)	必	2	Freshman English (1) (Level 3)
大一英文(1)(第四級)	必	2	Freshman English (1) (Level 4)
大一英文(2)(第一級)	必	2	Freshman English (2) (Level 1)
大一英文(2)(第二級)	必	2	Freshman English (2) (Level 2)
大一英文(2)(第三級)	必	2	Freshman English (2) (Level 3)
大一英文(2)(第四級)	必	2	Freshman English (2) (Level 4)
外語實務	必	0	Foreign Language Proficiency Test
外語實務訓練(1)	必	0	Remedial Skills for English Learning(1)
外語實務訓練(2)	必	0	Remedial Skills for English Learning(2)

(三) 公民教育-憲法 (2 學分)

中文名稱	學分	修別	英文名稱
憲法	2	必	Constitution

(四) 通識領域 (12 學分) + 通識教育講座 (1 學分)

通識領域分四大類，每門課程各為2學分，四技一年級~三年級應於通識選項課程中，修讀6門通識課程。

各學院修讀類別如下：

- 1、農學院：人文學科(2門)、社會科學(3門)、數理與應用科學(1門)。
- 2、工學院：人文學科(2門)、社會科學(3門)、自然與生命科學(1門)。
- 3、管理學院：人文學科(2門)、社會科學(2門)、自然與生命科學(1門)、數理與應用科學(1門)。
- 4、人文暨社會科學院：人文學科(2門)、社會科學(2門)、自然與生命科學(1門)、數理與應用科學(1門)。
- 5、國際學院：人文學科(2門)、社會科學(3門)、數理與應用科學(1門)。
- 6、獸醫學院：人文學科(2門)、社會科學(3門)、數理與應用科學(1門)。

(1)第一類：人文學科 (Humanities)

- 歷史與文化
- 文學與藝術
- 哲學與宗教
- 道德判斷與推理

(2)第二類：社會科學 (Social Sciences)

- 法律與政治
- 社會分析與心理
- 經濟與管理

(3)第三類：自然與生命科學 (Natural and Life Sciences)

- 自然科學
- 生命科學
- 生物技術
- 環境科學

(4)第四類：數理與應用科學 (Mathematics and Applied Sciences)

- 數理與邏輯
- 資訊科技
- 應用科學

※ 通識教育講座(1 學分) (畢業前須修畢)

- 1.生命體驗與學思歷程
- 2.全球化與本土化的互動
- 3.人文與科技的對話

(五) 體育領域 (2 學分)

四技一年級上、下學期為原班授課之大一體育；另有體育特別班，供申請核准之特殊狀況學生修習。

中文名稱	修別	學分	英文名稱
大一體育(1)	必	1	Freshman P.E.(1)
大一體育(2)	必	1	Freshman P.E.(2)
體育選項	必	1	Optional P.E. for Interest
體育(特別班)	必	1	P.E. (Special P. E.)

【不分系所選修科目】

全民國防教育軍事訓練學分列計畢業學分數由各系自行認定。

(一) 軍護領域

全民國防教育軍事訓練

中文名稱	修別	學分	英文名稱
全民國防教育軍事訓練- 防衛動員	選	2	All-out Defense Education Military Training- Defense Mobilization
全民國防教育軍事訓練- 國防科技	選	2	All-out Defense Education Military Training- Defense Technology
全民國防教育軍事訓練- 全民國防	選	2	All-out Defense Education Military Training- Civil defense
全民國防教育軍事訓練- 國防政策	選	2	All-out Defense Education Military Training- National Defense Policies
全民國防教育軍事訓練- 國際情勢	選	2	All-out Defense Education Military Training- International Situations

農學院 課程與核心能力之關聯檢核表

核心能力	能力指標與核心素養	對應課程	檢核機制
1. 具有農業專業知識	具備農業相關專業知識、技術及經營管理之基本能力	一、 院定必選修 ：實務專題、普通化學、普通化學實驗、普通物理學、普通物理學實驗、生物統計、生物統計實習、永續農業、永續農業國內外專業實習、專技英文寫作、進階專業英文溝通技巧、進階專技英文寫作、生物技術實習、生物資訊學、犬隻照養技術、犬隻傳染病與公共衛生、校外實習、工作犬簡介、犬隻解剖生理學、協助犬訓練技術、協助犬訓練技術實習、偵測犬訓練技術、偵測犬訓練技術實習、視覺障礙重建概論、動物福利與法令 二、 本院各系所一般課程及專業課程	本院課程委員會定期依學校與本院教育宗旨與目標，審議本院院定課程的妥適性，審核課程是否具有時代性，並能配合各系專業教育之需求，依社會變遷與就業市場情況，討論
2. 具邏輯思考、判斷、執行及創新能力	1. 應用各種工具蒐集並分析資料能力 2. 尋求解決問題方法及問題解決能力 3. 創新思考及創新研發能力	一、 院定必選修 ：實務專題、普通化學實驗、普通物理學實驗、生物統計、生物統計實習、永續農業、永續農業國內外專業實習、生物技術實習、生物資訊學、犬隻敏捷訓練與實習、犬隻服從訓練實習、犬隻行為學、犬舍設計與經營管理、工作犬產業行銷學、校外實習、定向行動概論、犬隻解剖生理學、協助犬訓練技術、協助犬訓練技術實習、偵測犬訓練技術、偵測犬訓練技術實習、視覺障礙重建概論、動物福利與法令 二、 本院各系所一般課程及專業課程	課程規劃是否符合就業市場需求及有助於學生就業競爭能力。同時組織院共同必修課程之教學小組，以協助提高教學品質及減少教師授課負擔，設置教學小組之課程為生物技術、生物統計，提供院內學生完整的學習課程體系。
3. 具溝通、協調及合作能力	1. 良好的溝通技巧及態度 2. 整合協調能力 3. 敬業合群、樂觀進取 4. 良好人際關係與自我學習 5. 團隊組織的管理與領導	一、 院定必選修 ：實務專題、永續農業國內外專業實習、專技英文寫作、進階專技英文寫作、進階專業英文溝通技巧、犬隻敏捷訓練與實習、犬隻服從訓練實習、校外實習、犬舍設計與經營管理、工作犬產業行銷學、犬隻解剖生理學、協助犬訓練技術、協助犬訓練技術實習、偵測犬訓練技術、偵測犬訓練技術實習、視覺障礙重建概論、動物福利與法令 二、 本院各系所一般課程及專業課程	
4. 具有外語能力及國際視野	1. 具備國際觀之素養 2. 瞭解國際社會與全球發展 3. 基礎外語聽說讀寫能力	一、 院定必選修 ：永續農業、永續農業國內外專業實習、專技英文寫作、進階專技英文寫作、進階專業英文溝通技巧、工作犬概論、工作犬簡介、定向行動概論 二、 本院各系所一般課程及專業課程	

農學院課程與核心能力關聯表

【院定必修】				
核心能力項目 科目名稱	具有農業專業知識	具邏輯思考、判斷、執行及創新能力	具溝通、協調及合作能力	具有外語能力及國際視野
實務專題	●	●	●	
普通化學	●			
普通化學實驗	●	●		
普通物理學	●			
普通物理學實驗	●	●		
生物統計	●	●		
生物統計實習	●	●		

農學院課程與核心能力關聯表

【院定選修】				
核心能力項目 科目名稱	具有農業專業知識	具邏輯思考、判斷、執行及創新能力	具溝通、協調及合作能力	具有外語能力及國際視野
永續農業	●	●		●
永續農業國內外專業實習	●	●	●	●
專技英文寫作	●		●	●
進階專技英文寫作	●		●	●
進階專業英文溝通技巧	●		●	●
生物技術實習	●	●		
工作犬概論				●
犬隻敏捷訓練與實習		●	●	
犬隻服從訓練實習		●	●	
犬隻服從訓練		●	●	
犬隻行為學		●		
犬隻照養技術	●			
犬舍設計與經營管理		●	●	
犬隻傳染病與公共衛生	●			
工作犬產業行銷學	●	●	●	
工作犬簡介	●			●
校外實習	●	●	●	
定向行動概論		●		●
犬隻解剖生理學	●	●	●	

協助犬訓練技術	●	●	●	
協助犬訓練技術實習	●	●	●	
偵測犬訓練技術	●	●	●	
偵測犬訓練技術實習	●	●	●	
視覺障礙重建概論	●	●	●	
動物福利與法令	●	●	●	

工學院 課程與核心能力之關聯檢核表

核心能力	能力指標與 核心素養	對應課程	檢核機制
專業知識 具備跨領域基礎科學暨各專業工程知識以及能進行工程問題分析暨解決以及溝通表達之能力	1. 具備工程相關基礎科學之知識 2. 具備各專業工程知識 3. 具備工程問題分析、解決、以及溝通表達之能力	➤ 院定必修 1.普通化學(1) 2.普通化學實驗(1) 3.普通物理學(1) 4.普通物理學實驗(1) 5.微積分(1) 6.實務專題 ➤ 校定必修 1.通識課程(自然與生命科學 2 學分) 2.通識教育講座 ➤ 各系專業必選修課程	修畢下列課程 ➤ 各系專業課程 ➤ 院定必修科目： 普通化學(1) 3 學分、普通化學實驗(1) 1 學分、普通物理學(1) 3 學分、普通物理學實驗(1) 1 學分、微積分 3 學分、工程倫理與法規 1 學分、實務專題 2 學分 ➤ 校定共同必修科目： 通識課程12學分(人文學科4 學分、社會科學6 學分、自然與生命科學2 學分)、國文、大一英文、體育4學分、英語聽講練習、憲法2學分、通識教育講座1 學分、生活服務教育、外語實務0學分
終身學習 具備持續學習科學與專業工程知識的能力	1. 具備基礎科學之知識 2. 具備各專業工程知識 3. 持續學習之能力	➤ 院定必修 1.普通化學(1) 2.普通化學實驗(1) 3.普通物理學(1) 4.普通物理學實驗(1) 5.微積分(1) 6.實務專題 ➤ 校定必修 1.國文 2.通識課程(自然與生命科學 2 學分) 3.英文 4.英文聽講練習 5.外語實務 6.通識教育講座 ➤ 各系專業必選修課程	
人文素養、社會關懷 具備對人文道德倫理、科技法律及社會公義的基本認知	1. 具備工程倫理之基本認知 2. 具備科技法律之基本認知 3. 具備社會正義之基本認知	➤ 院定必修 1.工程倫理與法規 ➤ 校定必修 1.國文 2.通識課程(人文學科 4 學分、社會科學6 學分) 3.通識教育講座 4.憲法 5.生活服務教育 6.通識教育講座	
實務技術 具備工程實務與執行能力	1. 瞭解工程實務設計與未來發展方向 2. 具備專題製作之能力	➤ 院定必修 1.實務專題	

核心能力	能力指標與 核心素養	對應課程	檢核機制
國際視野 具備接軌國際、了解國際工程技術發展趨勢之能力	1. 具備團體合作精神 2. 具備溝通與協調之能力 3. 具備組織與領導之能力 4. 具備與異文化人士溝通之能力	➤ 院定必修 1.普通化學(1) 2.普通化學實驗(1) 3.普通物理學(1) 4.普通物理學實驗(1) 5.微積分(1) ➤ 校定必修 1.通識課程(自然與生命科學2學分) 2.英文 3.英文聽講練習 101、102 4.外語實務 5.通識教育講座	

工學院大學部課程與核心能力關聯表

科目名稱 \ 核心能力項目	專業知識	終身學習	人文素養、 社會關懷	實務技術	國際視野
普通化學(1)	●	●			●
普通化學實驗(1)	●	●			●
普通物理學(1)	●	●			●
普通物理學實驗(1)	●	●			●
微積分(1)	●	●			●
工程倫理與法規			●		
實務專題	●	●		●	

管理學院_必修課程與核心能力之關聯檢核表

核心能力	能力指標與 核心素養	對應課程	檢核機制
基本經營管理 知識能力	<ul style="list-style-type: none"> ➤ 學生具備基本企業經營管理知識素養 ➤ 培養學生具備基本三計知識素養 ➤ 培養學生運用電腦資訊能力素養 	管理學、經濟學(1)、會計學(1)、電子計算機概論、統計學(1)、統計學(2)	院定必修課程：管理學(3 學分)、經濟學(1) (3 學分)、會計學(1) (3 學分)、統計學(1) (2 學分)、統計學(2) (2 學分)、電子計算機概論(0 學分)
問題解決與溝通能力	<ul style="list-style-type: none"> ➤ 學生具備問題解決之素養 ➤ 學生具備尊重與接納他人意見之素養 ➤ 學生具備組織管理之素養 	管理學、經濟學(1)、會計學(1)、電子計算機概論、統計學(1)、統計學(2)	
專業與實務應用能力	<ul style="list-style-type: none"> ➤ 學生具備專題製作能力之素養 	管理學、電子計算機概論	
社會責任與專業倫理之能力	<ul style="list-style-type: none"> ➤ 學生具備人文關懷與社會適應力素養 ➤ 學生具備健全道德觀念 	管理學	

管理學院大學部院定必修課程與核心能力關聯表

核心能力項目 科目名稱	基本經營管理知識能力	問題解決與溝通能力	專業與實務應用能力	社會責任與專業倫理之能力
管理學	✓	✓	✓	✓
經濟學(1)	✓	✓		
會計學(1)	✓	✓		
統計學(1)	✓	✓		
統計學(2)	✓	✓		
電子計算機概論	✓	✓	✓	

人文暨社會科學院 大學部 課程與核心能力關聯表

科目名稱 \ 核心能力項目	專業及實作能力	社會適應能力	問題解決及創新能力	領導溝通能力	社會關懷能力	全方位的思考能力	國際化移動能力
心理學	•	•	•	•	•	•	•
社會學	•	•	•	•	•	•	•
電子計算機概論	•	•	•		•	•	

人文暨社會科學院 大學部 課程與核心能力之關聯檢核表

核心能力	能力指標與核心素養	對應課程	檢核機制
專業及實作能力	1. 精進專業知能 2. 精熟實作能力 3. 提升實務技能	心理學、社會學、 電子計算機概論	一、修畢本院基礎課程（心理學、社會學、電子計算機概論）五學分。 二、完成各科書面及口頭報告。
社會適應能力	1. 培養自律與責任感 2. 建立融洽社會關係 3. 終身學習	心理學、社會學、 電子計算機概論	
問題解決及創新能力	1. 分析與判斷能力 2. 問題導向思考 3. 創新管理與執行力	心理學、社會學、 電子計算機概論	
領導溝通能力	1. 適當表達自我意識 2. 尊重接納他人意見 3. 培養團隊合作精神	心理學、社會學、	
社會關懷能力	1. 主動關懷社會弱勢 2. 加入社會志工行列 3. 參與社會公益活動	心理學、社會學、	
全方位思考能力	1. 啟發創意思考能力 2. 增進多元思維能力 3. 培養獨立思考能力	心理學、社會學、 電子計算機概論	
國際化移動能力	1. 拓展國際視野與移動 2. 國際化之前瞻思考 3. 建立全球意識	心理學、社會學、 電子計算機概論	

國際學院 課程與核心能力之關聯檢核表

核心能力 Core Capabilities	能力指標與核心素養 Capabilities Index and Core Accomplishment	對應課程 Related Courses	檢核機制 Evaluation
1.多元知識與優良職場能力	1. 具備多元化專業基礎知識。 2. 具備相關專業技術及經營管理之基本能力。 3. 培養自律與責任感。 4. 培養良好人際關係。	生態學、生物統計/統計學、生物統計實習/統計學實習、電子計算機概論、永續發展趨勢、實務專題、國際談判、談判與溝通	一、修畢本院院必修基礎課程（生態學、生物統計/統計、生物統計/統計實習、永續發展趨勢、實務專題）十學分。 二、修畢各系〈學程〉之系〈學程〉定必修課程。 三、修畢校定共同必修科目。 四、完成各科考試、服務以及書面及口頭報告。
2.實務應用與社會變遷適應能力	1. 具備應用實務技能及各種工具蒐集並分析資料的能力。 2. 培養尋求解決問題方法及問題解決能力。 3. 培養自我學習。	生態學、生物統計/統計學、生物統計實習/統計學實習、電子計算機概論、永續發展趨勢、實務專題、國際談判、談判與溝通	
3.溝通協調與團隊合作能力	1. 具備適當表達自我意識的能力。 2. 培養良好的溝通技巧及態度。 3. 培養尊重接納他人意見的涵養。 4. 培養敬業合群、樂觀進取、團隊合作的精神。	生態學、生物統計實習/統計學實習、永續發展趨勢、實務專題、國際談判、談判與溝通	
4.國際化視野與尊重文化差異的氣度	1. 具備國際觀之素養。 2. 培養國際化之前瞻思考。 3. 建立全球意識。	生態學、永續發展趨勢、實務專題、國際談判、談判與溝通	

國際學院 課程與核心能力關聯表

【專業必修】院定專業共同必修 Common courses required by department for specialty				
<div>核心能力項目 Courses capabilities</div> <div>科目名稱 Courses</div>	1. 多元知識與 優良職場能力	2. 實務應用與社會 變遷適應能力	3. 溝通協調與 團隊合作能力	4. 國際化視野 與尊重文化 差異的氣度
生態學 Ecology	V	V		V
生物統計/統計學 Biometry/ Statistics	V	V		
生物統計實習/統計學實習 Practice of Biometry/ Practice of Statistics	V	V	V	
電子計算機概論 Introduction to Computers	V	V		
永續發展趨勢 Trends in Sustainable Development	V	V	V	V
實務專題 Special Projects	V	V	V	V

【專業選修】院定專業共同選修 Common courses Elective by department for specialty				
<div>核心能力項目 Courses capabilities</div> <div>科目名稱 Courses</div>	1. 多元知識與 優良職場能力	2. 實務應用與社會 變遷適應能力	3. 溝通協調與 團隊合作能力	4. 國際化視野 與尊重文化 差異的氣度
永續發展趨勢 Trends in Sustainable Development	V	V	V	V
國際談判 International Negotiation	V	V	V	V
談判與溝通 Negotiation Strategies and Tactics for Business	V	V	V	V

各學院課程中英文摘要

一、農學院

實務專題

本課程在訓練學生運用適當之研究方法完成專題計畫。學生將以個人與指導老師進行討論方式進行資料蒐集、分析、論文撰寫、與專題發表。

Special Projects

This course aims to develop students ability in completing research along with discuss with instructor to finish specific experiments. Students will have to finish a study with a special topic they choose. A final oral presentation will be held later this year.

普通化學(1)

本課程開設之目標為訓練學生使熟悉各種化學之基本操作，並驗證各有關之化學原理。其內容為：1.安全及環保教育講習。 2. 混何物分離。 3.密度測量。 4. 質量守恆定律。 5. 化學式的測定。 6. 固體中水分測量。 7. 定組成定律。 8. 氧化還原反應。9. 溶液的配製。10. 氧化還原滴定。 11.化學平衡。 12.一酸及鹼之 pH 值測定。13.酸鹼滴定。 14. 滴定曲線繪製。

General Chemistry (1)

This course provides students a profound understanding of subject-matter from laboratory work and familiarity with basic laboratory technique. The outlines are as below: 1. Basic laboratory rules and safety. 2. Separation of mixtures. 3. Determination of density. 4. Law of conservation of mass. 5. Determination of empirical formula. 6. Determination of water content in solid. 7. Law of definite composition. 8. Oxidation-Reduction reactions. 9. Solution preparation. 10. Oxidation-Reduction titration. 11. Chemical equilibria. 12. Determination of pH. 13. Acid-Base titration. 14. Titration curve.

普通化學實驗(1)

本課程開設之目標為訓練學生使熟悉各種化學之基本操作，並驗證各有關之化學原理。其內容為：1.安全及環保教育講習。 2. 混何物分離。 3.密度測量。 4. 質量守恆定律。 5. 化學式的測定。 6. 固體中水分測量。 7. 定組成定律。 8. 氧化還原反應。9. 溶液的配製。10. 氧化還原滴定。 11.化學平衡。 12.一酸及鹼之 pH 值測定。13.酸鹼滴定。 14. 滴定曲線繪製。

General Chemistry Lab. (1)

This course provides students a profound understanding of subject-matter from laboratory work and familiarity with basic laboratory technique. The outlines are as below: 1. Basic laboratory rules and safety. 2. Separation of mixtures. 3. Determination of density. 4. Law of conservation of mass. 5. Determination of empirical formula. 6. Determination of water content in solid. 7. Law of definite composition. 8. Oxidation-Reduction reactions. 9. Solution preparation. 10. Oxidation-Reduction titration. 11. Chemical equilibria. 12. Determination of pH. 13. Acid-Base titration. 14. Titration curve.

普通物理學(1)

本課程旨在介紹物理的基本概念及原理，藉由例題實作演練，增進同學對物理觀念及原理之了解，並提昇同學解決問題及計算之能力，以奠定修習專業科目的基礎。課程內容

包括： 1.物理量及單位 2.直線運動 3.平面運動 4.動力學 5.功與能 6.質點系之力學。

General Physics (1)

(1)Introduction, (2)Motion along a Straight Line, (3)Motion in a Plane, (4)The Laws of Motion, (5)Work and Energy, (6)Linear Momentum.

普通物理學實驗(1)

本課程之目的為使學生藉由物理實驗過程來印證古典力學、流體力學、熱力學之理論及定律，同時培養學生實作能力。課程內容包括：(1)基本量測，(2)PASCO 軟體介紹，(3)自由落體，(4)牛頓第二運動定律，(5)單擺，(6)摩擦係數，(7)碰撞，(8)表面張力，(9)固體比熱，(10)液體比熱，(11)線膨脹，(12)熱功當量，(13)牛頓冷卻定律。

General Physics Lab. (1)

The purpose of this course is to enable students to demonstrate the theory and laws of classical mechanics, fluid mechanics and thermodynamics by means of physical experiments and to develop students' practical ability. (3) Free fall, (4) Newton's second law of motion, (5) Simple pendulum, (6) Coefficient of friction, (7) Collision, (2) Pasco software introduction, (8) surface tension, (9) solid specific heat, (10) liquid specific heat, (11) linear expansion, (12) thermal equivalent, (13) Newton's law of cooling.

生物統計

本課程內容包括數據資料之特性及分析方式，並介紹敘述統計，各種分布(包括常態、二項式、多項式、卜瓦松、t、卡方、F 等分布)、信賴區間應用、假設檢定與變方分析等。

Biometry

The course introduces data characteristics and analysis methods. Other main topics include the descriptive statistics, different distributions such as normal, binomial, polynomial, Poisson, t, chi-square, and F-distribution, confidence interval applications, hypothesis testing and analysis of variance.

生物統計實習

本實習依上課進度進行對數據整理，敘述統計及各項分布(常態，二項式，多項式，卜瓦松，t，X, F 分布)及其信賴區間等，以生物數據實例進行練習。

Practice of Biometry

This course is a practice lesson that follows the biostatistics course about data characteristics and analysis methods. Major focus will be on exercises of biological data for descriptive statistics, probability distributions (Normal, binomial, Poisson, t, chi-square, and F), confidence interval applications, hypothesis testing and analysis of variance.

院定選修

永續農學

最近的 20 年中，在創意和科技方面的顯著進展，已形成推動永續農業的良好機會。目前全球農業部門正面臨在有限的自然資源和氣候變遷的壓力下，仍必須提供足夠的食物、纖維、飼料、以及生質能源，以滿足全球不斷增加人口需求的挑戰；此外社會大眾也逐漸期待在農業生產過程中，能加強注重對環境生態、勞動人力、動物福利的維護。本課程將評論可以從環境生態和社會經濟等層面提升農業永續經營的農業栽培措施與技術和

管理系統，以及採用不同措施、技術和管理系統的優劣與得失。此外，本課程也將探討目前在提升農業永續經營上仍欠缺的知識，提供學生未來學習的方向。

In the last 20 years, there has been a remarkable emergence of innovations and technological advances that are generating promising changes and opportunities for sustainable agriculture, yet at the same time the agricultural sector worldwide faces numerous daunting challenges. Not only is the agricultural

sector expected to produce adequate food, fiber, and feed, and contribute to biofuels to meet the needs of a rising global population, it is expected to do so under increasingly scarce natural resources and climate change. Growing awareness of the unintended impacts associated with some agricultural production practices has led to heightened societal expectations for improved environmental, community, labor, and animal welfare standards in agriculture. This course reviews the state of knowledge on farming practices, technologies, and management systems that have the potential to improve the environmental,

social, and economic sustainability of agriculture, and discusses the tradeoffs and risks that might occur if more farms were to adopt those practices, technologies, and systems. This course also identifies knowledge gaps for future actions to improve agricultural sustainability.

專技英文寫作

本寫作課程專為非英文系學生設置，培養學生正確寫作觀念，能更有效率學習及自我學習英文習慣；拓過本欲笨課程指導，能藉由本課程內安排實地練習，增加寫作能力與學習自信心，進而讓學生習得全盤專技寫作能力，及修正自己論文寫作上缺失。

The course of Academic Writing is specially designed for non-English major students of NPUST. Even the most able student in a traditional classroom can feel overwhelming and unprepared in academic writing. This course aims to prepare students for the challenges of academic work by training them in effective study habits.

This course aims to guide students through the process of prewriting and writing essays, and prepare them to encounter academic writing with skills and confidence. At the end of this course, students will be able to -acquire overall knowledge of professional paper writing

-develop a capacity of publishing their professional papers

進階專技英文寫作

本 writing 寫作課程專為非英文系學生設置，培養學生正確寫作觀念，及自我學習英文習慣；能藉由本課程實地練習，增加寫作能力與學習自信心，進而讓學生習得全盤專技寫作能力，及修正自己論文寫作上缺失。

The course of Advanced Academic Writing is specially designed for non-English major students of NTPU. Even the most able student in a traditional classroom can feel overwhelming and unprepared in academic writing. This course aims to prepare students for the challenges of academic work by training them in effective study habits.

This course aims to guide students through the process of prewriting and writing essays, and prepare them to encounter academic writing with skills and confidence. At the end of this course, students will be able to...

-acquire overall knowledge of professional paper writing

-develop a capacity of publishing their professional papers

工作犬訓練學程

二、選修科目 Selective Courses

工作犬概論

2 選

陳晴惠

工作犬概論內容，廣泛介紹世界現有各項工作犬種類以及其相關知識，包括牧羊犬、雪橇犬、搜救犬、偵測犬、導盲犬、導聾犬、輔助犬及治療犬/陪伴犬等，種類眾多。雖然各工作犬項目功能及性質相異，卻均為運用犬隻優異的本能，以及其樂於服務協助人類的特性，加以培養訓練及發展出各項專長，並用以增進人類社會生活之品質。

Introduction of Working Dogs

2 E

Chen Ching Hui

The working dog summary will introduce different types of working dogs currently used over the world and relevant knowledge. This includes herding dogs, sled dogs, search and rescue dogs, detector dogs, guide dogs for the blind, hearing dogs for the deaf, service dogs for the disabled, therapy dogs and companion dogs for the sick/elderly etc. Although each work has its own unique characteristic and function, they were all based on canine's inherent abilities and willingness to provide service to men. This was utilized and developed into different fields to enhance the life quality of human society.

犬隻照養技術

2 選

夏良宙

犬隻照養包括從幼犬到成犬以致老犬的照顧方式，各時期之營養需求、疾病預防、身體清潔、毛的整理梳洗、指甲修剪和耳朵清理等照養的方法；另外也介紹如何安排一天的生活方式，有些狗住公寓，有些狗住鄉村，有些是住工作犬舍，他們活動的空間不同，就有不同帶出門散步的需求。犬舍管理這個項目針對飼養多隻的工作犬舍進行討論，包括每日犬舍打掃、新進犬隻的待遇、犬舍消毒和犬隻福利等，以及飼料儲存，廢棄物處理等項目。

Technology of Dog Care

2 E

Liang Chou Hsia

Dog care includes dietary requirements, disease prevention, grooming (such as coat brushing, nail clipping and ear cleaning), and overall healthcare throughout dogs life. There are also some basic knowledge regarding how to meet dogs' different needs appropriately according to their variable life style and environments (eg. apartment, countryside or kennels). Kennel management will cover cleaning, disinfection, maintenance of the environment, adjustment of incoming dogs, food storage, process of disposals and overall inhabitant comfort and health.

犬隻解剖生理學

2 選

劉炳燦、劉世賢、劉世華

本課程以犬隻解剖學及生理系統介紹犬隻身體各部位構造與功能，依次分別為骨骼、肌肉、神經、血管循環、呼吸、消化、吸收、代謝、排泄、內分泌及生殖等系統。

Anatomy of the dog 2 E Bing-Tsan Liu Shyh-Shyan Liu, Shyh-Hwa Liu

This course introduces the dog anatomy and physiological systems of the body structure and function of each part in turn were bones, muscles, nerves, blood vessels circulation, respiration, digestion, absorption, metabolism, excretion, endocrine and reproductive systems.

犬隻行為學

2 選

夏良宙

本課程之主要教學目的為：1.提供養狗者對狗行為之基本認識，2.做為訓練狗之基礎學門。本課程之內容包括下列各項：演化和家畜化、行為生物學、行為發育學、遺傳與行為學、攝取行為、社會行為、溝通行為、性行為、親子行為、學習行為、排糞尿行為、害

怕行為、刻板行為、破壞行為、老狗行為、品種間行為之差異、犬隻和人之關係。

Dog ethology

2 E

Liang Chou Hsia

The purpose of this class is to let students 1. understand the basic behavior of dog, 2. use this knowledge as a tool to train dogs. The content of the course include: evolution and domestication, behavior biology, behavior development, genetics and behavior, ingestive behavior, social behavior, communication behavior, sexual behavior, maternal behavior, learning behavior, eliminative behavior, fear, stereotypic behavior, destructive behavior, elderly behavior, behavior difference among breeds, relationship between dog and human beings.

犬隻服從訓練

2 選

周甫炫

服從訓練為維持人犬間良好關係理想方式之一，更是行為矯正最基本的方法，主要從狗對人及狗對其他動物的社會化入門，相處時建立適當位階、增加彼此溝通之默契，針對坐下、趴下、過來、坐下等待、趴下等待、定點休息和跟著走等項目進行訓練，讓狗能依主人口令做出正確的動作。

Obedience Training

2 E

Ju Bo Hyoun

Obedience training is an ideal way to build up good relationship between men and dogs. By doing this properly, it's not only helping to set up correct hierarchy, but also providing important foundation of any training programs. This training covers basic commands such as "sit", "down", "come", "sit and wait", "down and wait" and "heel", and requires dogs to fully understand and follow these commands.

犬隻服從訓練實習

1 選

周甫炫

服從訓練為維持人犬間良好關係理想方式之一，更是行為矯正最基本的方法，主要從狗對人及狗對其他動物的社會化入門，相處時建立適當位階、增加彼此溝通之默契，針對坐下、趴下、過來、坐下等待、趴下等待、定點休息和跟著走等項目進行訓練，讓狗能依主人口令做出正確的動作。

Obedience Training and Practice

1 E

Ju Bo Hyoun

Obedience training is an ideal way to build up good relationship between men and dogs. By doing this properly, it's not only helping to set up correct hierarchy, but also providing important foundation of any training programs. This training covers basic commands such as "sit", "down", "come", "sit and wait", "down and wait" and "heel", and requires dogs to fully understand and follow these commands.

協助犬訓練技術

2 選

陳晴惠

協助犬訓練基本學習及訓練知識實作，包括犬類行為觀察、制約訓練、導聾犬訓練、導盲犬訓練、肢輔犬訓練實作及犬舍參觀、身心障礙者活動設計。

Technology of Assistance

2

E Chen Ching HuiDog Training

Hands-on lab for Students to improve their observation skills and training skills. They will be require to train various tasks for hearing dog, guide dog and service dog work. Lab activities kennel tours and simulation exercises for students to understand How the disabled perceive the world, what the need and what they might be helped with the assistance dogs.

協助犬訓練技術實習

1 選

陳晴惠

協助犬訓練基本學習及訓練知識實作，包括犬類行為觀察、制約訓練、導聾犬訓練、導盲犬訓練、肢輔犬訓練實作及犬舍參觀、身心障礙者活動設計。

Technology of Assistance Dog Training and Practice 1 E Chen Ching Hui

Hands-on lab for Students to improve their observation skills and training skills. They will be required to train various tasks for hearing dog, guide dog and service dog work. Lab activities include kennel tours and simulation exercises for students to understand how the disabled perceive the world, what the need is and what they might be helped with by the assistance dogs.

偵測犬訓練技術 2 選 周甫炫

本課程介紹偵測犬目前的應用以及針對各項偵測犬從選擇測驗、訓練理論到訓練實務分別講解，並讓學生有實際操作訓練的機會。

Technology of Detector Dog Training 2 E Ju Bo Hyoun

The class will introduce the application of detector dog in the moment and individual part of detector dog from selection test, principle of training and give chance for students to practice.

偵測犬訓練技術實習 1 選 周甫炫

本課程介紹偵測犬目前的應用以及針對各項偵測犬從選擇測驗、訓練理論到訓練實務分別講解，並讓學生有實際操作訓練的機會。

Technology of Detector Dog Training and Practice 1 E Ju Bo Hyoun

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視覺障礙重建概論	2	選	待聘
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視覺障礙重建概論分為定向與行動、點字、職務再設計三大主軸，藉由各種輔具的介紹（人導法、手杖、點字）學習如何教導視障者在行動的過程中，利用身邊的線索如：陽光、風向、氣味等搜尋並建構地圖，瞭解方向與方位、空間概念等，使其能獨立的行動，並學習尋求他人之協助，以期安全、迅速的抵達目的地，增進視障者學習的機會，擴展視障者的生活經驗。

Introduction of Visual Barrier Reconstruction 2 E

Introduction of vocational rehabilitation is divided into orientation and mobility 、 Braille and job redesigning three major part. By introduction of assistance aids (Human-guides Techniques, white cane, Braille) learning how to teach blind people use the information such as sunshine, wind direction and smell, etc., to search and build map in his mind on the process of moving, to understand direction, position and space, etc.. The purpose is that blind people can move by himself, learn how to ask help on the process of moving, go to the destination safety and fast. Blind people will have more chance to study, and expand the experience of life.

犬隻敏捷訓練與實習 2 選 陳晴惠

犬敏捷運動可增加人狗之間的情感，提高彼此的默契，提升犬隻對人類社會的融入，使雙方擁有更多相處互動的方式與樂趣。相處時建立適當位階、增加彼此溝通之默契，針對坐下、趴下、過來、坐下等待、趴下等待、定點休息和跟著走等項目進行訓練，讓狗能依主人口令做出正確的動作；課程中會從最基本的繫牽繩訓練到高階的無牽繩伴行進行說明，並會針對各種訓練用的工具分別介紹。

Dog Agility Training and Practice **2** **E** **Chen Ching Hui**

Dog agility training can increase the emotional bonding between pet owners and their pets, improve mutual understanding, facilitate the integration of dogs into human's society, so that both sides can have better interaction with each other and enjoy the fun of companionship. It's important to teach the dogs to know their position in the hierarchy, which can increase the effectiveness of communication and facilitate the teaching and learning of the basic commands, such as sit down, get on the ground, sit down and wait, get down to wait, fixed-point rest and follow. The class will start from basic on-leash to more advanced free- of- leash training, and basic training equipment will be introduced in the course as well.

犬舍設計與經營管理

2 選

陳晴惠

目前狗旅館是很熱門的行業，也紛紛設計建造新穎豪華的犬舍，然而在設計建造時需要注意的事項是非常重要的，舉凡位置及坐落方向的選擇、電力及供水的來源、汙水的處理、陽光照射或特殊天候的預防、接待室、員工休息室、準備室、淋浴間和儲藏室等都需要在設計時列入考慮。經營管理時清掃、散放、餵食、洗澡和修爪剪毛等例行工作，或是每月要投予的心絲蟲和跳蚤預防藥，還有每年要進行的預防注射或內寄生蟲驅除等健康維護都是應妥善安排的事項。

Kennel design and management

2 E

Chen Ching Hui

Recently dog hotel has developed into a very popular industry, and many luxurious kennel have been designed and constructed. However when designing a kennel, many issues have to be taken into consideration, such as location, the source of electricity and water supply, sewage treatment, sun exposure or precautions for special weather conditions, reception rooms, staff lounges, preparation rooms, showers and storage rooms. All of these items need to be taken into account when kennels are designed. Furthermore, dog management issues and routine works such as , cleaning, dispersing, feeding, bathing and claw clipping, and the administration of monthly preventive heartworm and flea medication, and annual injections for internal parasites are also important and to should be properly arranged.

犬隻傳染病與公共衛生

2 選

待聘

犬隻傳染病病原計有病毒、細菌、黴菌、原蟲、內寄生蟲和外寄生蟲等。畜主或伴侶犬經營者應熟習這些傳染病，在公共衛生的考慮下，做好健康維護和傳染病預防，同時也兼顧人類的健康，不受愛犬少數共通傳染病病原的影響。

Dogs Infectious Diseases and Public Health

2

E

Dogs Infectious diseases include viruses, bacteria, molds, protozoa, parasites and parasites. Livestock or companion dog operators should be familiar with these infectious diseases, in public health considerations, good health maintenance and infectious disease prevention, but also take into account the health of mankind, not a small number of dogs affected by the impact of infectious diseases.

工作犬簡介

2 選

待聘

工作犬概論內容，廣泛介紹世界現有各項工作犬種類以及其相關知識，包括牧羊犬、雪橇犬、搜救犬、偵測犬、導盲犬、導聾犬、輔助犬及治療犬/陪伴犬等，種類眾多。雖然各工作犬項目功能及性質相異，卻均為運用犬隻優異的本能，以及其樂於服務協助人類的特性，加以培養訓練及發展出各項專長，並用以增進人類社會生活之品質。

Working Dogs

2 E

The purpose of this course is to study the microbiological science and to give students the basic knowledge further study of phytopathogenic microbiology. Course contents include the original of microbiology, chemical principles, microscopy and staining, morphology、structure and function of prokaryotic and eukaryotic cell, microbial growth and metabolism, microbial genetics and biotechnology, and the control of microorganisms.

工作犬產業行銷學

2 選

待聘

工作犬項目繁多，如果希望在台灣廣泛推動，必須運用行銷學的方策，針對行銷的意義、市場理念的推進、行銷的應用和管理等內容，讓學生對行銷工作犬有基本的認識。

Working Dog Industry Marketing

2 E

If we want working dog to be widely promoted in Taiwan, we must use the marketing strategy, for the marketing significance, the promotion of the market concept, the application of marketing and management and so on, so that students have a basic understanding of working dog industry marketing .

校外實習

3 選

待聘

本課程之目的在使學生在校外實務實習中，將所學理論與實際配合，在操作中學習，了解當前業界現況與職能需求。

Field practice

3 E

The purpose of this course is to enable students to study and understand the current situation and functional requirements of the industry in the practical practice field.

定向行動概論

2 選

待聘

定向行動概論分為定向與行動兩大主軸，藉由各種輔具的介紹（人導法、手杖、導盲犬、放大倍率望遠鏡）與感官功能的分析，學習如何教導視障者在行動的過程中，利用身邊的線索如：陽光、風向、氣味等搜尋並建構地圖，瞭解方向與方位、空間概念等，使其能獨立的行動，並學習尋求他人之協助，以期安全、迅速的抵達目的地，增進視障者學習的機會，擴展視障者的生活經驗。

Introduction of orientation and mobility 2 E

Introduction of orientation and mobility is divided into two major parts: 1. orientation2. mobility. By introducing assistance aids (Human-guides Techniques, white cane, guide dog, high magnifying telescope) and analyzing the other senses, the students learn how to teach blind people use the information such as sunshine, wind direction and smell, etc., to search and build mental map in the process of moving. Also they need to understand direction, position and space, etc.. The purpose is that blind people will be able to move by himself, learn how to ask for help if necessary, get to the destination safely and fast. Then they will have more chance to study, and expand their life experiences.

動物福利與法令

選

待聘

主要針對工作犬的居住空間、籠舍大小、每日飲食、運動及訓練方式進行規範，並說明動物福利的相關法令。

Animal Welfare and Law

E

Mainly to regulate living space, cottage size, daily diet, exercise and training methodse for working dogs and explain related laws and regulations of animal welfare.

二、工學院 實務專題

此課程培養學生基礎實務能力,藉由在學中所學理論與實作加以應用與實現。

Special Projects

The goal of this course is to educate thhe basiic ability of technology throughh learning theory and its applied skills.

普通化學(1)

本課程的目的在使學生習得化學之基本概念並熟悉化學的理論與計量方法,做為修讀普通化學(二)的基礎並奠定修習及研究專業科目的穩固基礎,其內容如下:1.化學概念、2.原子結構、3.化學反應中的質量關係、4.水溶液的反應性、5.氣體特性、6.熱化學、7.量子理論、8.元素的週期表關係。

General Chemistry (1)

The course is an attempt to give the students with basic concepts, principle and mathematical methods of chemistry in order to build up foundations for the study of Chemistry (2) and the other related sciences. The outlines are offered as below: 1.Chemistry conceptions, 2.Atomic structure, 3.Mass relationships in chemical reactions, 4.reactions in aqueous solution, 5.Gases, 6.Thermochemistry, 7.Quantum theory, 8.Periodic relationships among the elements.

普通化學實驗(1)

本課程之主要目的著重於基本普通化學實驗操作之培養、觀察及量測之方法並熟悉計算之原則,藉由觀察與量測以驗證各項化學定律與原則,做為修讀普通化學實驗(二)的基礎並奠定相關實驗操作的基礎,其內容如下:1.混合物分離、2.密度的測量、3.固體中水含量之測定、4.質量守恒定律、5.化學計量、6.定組成定律、7.氧化還原反應、8.標準溶液配置、9.氧化還原滴定、10.氣體定律、11.利用蒸氣密度測定分子量、12.反應熱的測定、13.分子模型。

General Chemistry Lab. (1)

The purpose of this course emphasizes the skill of basic chemical experiment, methods of observations, measurement and basic calculation. Attempts to give the students identify the theory corresponding with observations and measurement. In order to build up foundations for the study of General Chemistry experiment (2) and the other related sciences. The outlines are offered as below: 1. The separation of mixtures, 2.Measurement of density, 3.Water content of solid, 4.Law of conservation of mass, 5.Stoichiometry, 6.Law of definite proportions, 7.Redox reaction, 8.Dilution of solutions, 9.Redox titration, 10.The gas laws, 11.Determinate the molar mass of a gas by its density value, 12.Measuring the enthalpy of reaction, 13.Molecular models.

普通物理學(1)

本課程旨在介紹物理的基本概念及原理,藉由例題實作演練,增進同學對物理觀念及原理之了解,並提昇同學解決問題及計算之能力,以奠定修習專業科目的基礎。課程內容包括: 1.物理量及單位 2.直線運動 3.平面運動 4.動力學 5.功與能 6.質點系之力學。

General Physics (1)

(1)Introduction, (2)Motion along a Straight Line, (3)Motion in a Plane, (4)The Laws of Motion, (5)Work and Energy, (6)Linear Momentum.

普通物理學實驗(1)

本課程之目的為使學生藉由物理實驗過程來印證古典力學、流體力學、熱力學之理論及定律，同時培養學生實作能力。課程內容包括：(1)基本量測，(2)PASCO 軟體介紹，(3)自由落體，(4)牛頓第二運動定律，(5)單擺，(6)摩擦係數，(7)碰撞，(8)表面張力，(9)固體比熱，(10)液體比熱，(11)線膨脹，(12)熱功當量，(13)牛頓冷卻定律。

General Physics Lab. (1)

The purpose of this course is to enable students to demonstrate the theory and laws of classical mechanics, fluid mechanics and thermodynamics by means of physical experiments and to develop students' practical ability. (3) Free fall, (4) Newton's second law of motion, (5) Simple pendulum, (6) Coefficient of friction, (7) Collision, (2) Pasco software introduction, (8) surface tension, (9) solid specific heat, (10) liquid specific heat, (11) linear expansion, (12) thermal equivalent, (13) Newton's law of cooling.

微積分(1)

本課程希望在一學期中，能使學生對微分及積分有充分的瞭解、培養邏輯推理、啟發思考創造、強化計算演繹並注重應用與作圖，以建立同學未來學習工程數學及相關專業課程之數學基礎，充分達到學以致用的目的。課程內容包括：1.極限與連續，2.導數及其應用，3.不定積分與定積分，4.超越函數及其反函數，5.積分法則，6.不定型與瑕積分，7.定積分的應用，8.重積分。

Calculus (1)

This course aims at developing comprehension of Derivation and Integral、activating capabilities of Logic Inference and Induction、enlightening confidence and independence、strengthening calculating abilities with an emphasis on its application and diagram、furnishing a sound basis for future specialty. The content includes: 1.Limits and Continuity, 2.Derivative and Application, 3.Indefinite and Definite Integral, 4.Transcendental Functions and their Inverses, 5.Techniques of Integration, 6.Indeterminate Forms and Improper Integral, 7.Application of Integration, 8.Multiple Integration.

工程倫理與法規

課程在於教授未來之工程師如何權衡工程設計與倫理的衝突與矛盾。主要內容如下:本國際工程趨勢剖析、採購法、商標法、專利法、專利鑑定與侵權處理、環境倫理與法規、資訊/基因倫理及其法規、學術/職場倫理及其法規。

Ethics and Law in Engineering

The course is focused on how to address the opposite issues between the engineering design and ethics for the future engineering. The content includes international trends, law of procurement act, patent application, identification, right treatment and relative laws, environmental ethics and laws, information/gene ethics and laws, and academic/job ethic and laws.

三、管理學院

管理學

本課程旨在使學生獲得組織與管理之理論及實務之相關知識。內容包括：1.管理思潮之演進 9.領導 2.外在環境 10.控制 3.決策 11.溝通 4.規劃 12.變革 5.組織設計 13.衝突 6.職權 14.壓力 7.權力 15.組織文化 8.激勵 16.國際管理

Management

The objective of this course is designed to teach the related knowledge of the theory and practice of organization and management. The main subjects are summarized as follows:
1.The evolution of Management Thought 2.Environment 3.Decision 4.Planning
5.Organization Design 6.Authority 7.Power 8.Motivation 9.Leadership 10.Control
11.Communication 12.Change 13.Conflict 14.Stress 15.Organizational Culture
16.International Manag

經濟學(1)

經濟學通常被歸類為社會科學，它是研究人類經濟行為的科學。經濟行為就是選擇的行為，人們要做選擇，是因為人們所擁有的資源是有限的，而且每種資源都有多種用途。本科目的教學目標在協助學生如何研究消費、生產、交易、分配等日常生活的經濟問題，並運用經濟學的基本原理與分析方法，俾能在錯綜複雜的經濟社會中，權衡替選方案的輕重，決定取捨。本課程內容可分為個體經濟學與總體經濟學。個體經濟學是研究個別經濟決策者的行為，包括家戶單位與廠商的決策及其相互作用，以及由此所決定的市場價格及資源配置。總體經濟學是研究和整體經濟有關的變數間的關係與政府政策，如物價水準與就業水準、國民所得與經濟成長、貨幣與財政政策、以及金融機構的功能等。

Economics (1)

Economics is usually classed as a social science. It studies the humanly economic behavior, which is called as the choice behavior. Human beings need to make decisions because each kind of resources is scarce, and it also has competing uses. The purpose of this course is to introduce students to study the daily economic problems about consumption, production, transaction and distribution by applying the basic principle and analysis method of economics in order to make decisions from the different alternatives. The study of economics is divided into microeconomics and macroeconomics. Microeconomics describes the relation of individual market interactions, focusing on production and consumption by the individual consumer, firm, or industry. Macroeconomics studies the behavior of variables that describe the whole economy. And it also examines the behavior of such aggregates as the price level and employment level, national income and economic growth, monetary and fiscal policy, and the function of financial intermediaries et al.

會計學(1)

本課程之目標在於使學生瞭解財務會計及財務報表之重要性，目標在使學生瞭解會計報表之內涵及其分析方法，並瞭解如何運用財務報表進行企業決策。主要內容包括會計報表與企業決策、投資、融資決策與資產負債表、營運決策與損益表、調整程序、會計科目之闡釋與報告以及財務報表分析等。

Accounting (1)

The goals of this course are as follows: 1.To introduce to the students the importance of financial accounting and financial statements. 2.To help students learn how the investing, financing and operating decisions are reflected in the financial statements. 3.To help students understand how to apply these statements to business decisions. The major contents include financial statements and business decisions, investing and financing decisions and the balance sheet, operating decisions and the income statement, the adjustment process, reporting and interpreting assets, liabilities, sales, costs, owners' equity and financial statements analysis.

統計學(1)

本課程將教授統計學的基本概念、理論與應用，以期學習者可以利用統計學的觀念和方法，獲得合理的結論以解決問題，並透過實例，進行資料整理、分析並利用各種不同統計的方法以及適時使用統計軟體輔助資料分析。本課程的主要內容包含： 1.緒論 2.統計資料的性質與蒐集 3.統計資料的整理與分析 4.統計圖 5.平均數及差異量數 6.偏態與峰態 7.機率論 8.常用的機率分配

Statistics (1)

The major goal of the course is to help students construct the ability of using statistical method to solve problems under limited data and under uncertainty. The principle of statistics will be introduced in the course. Statistical software will be used in the course. Outline of the course include: 1.Introduction 2.Statistical data suchness and compile 3.Statistical data processing and analysis 4.Statistical Chart 5.Means or average and dispersion measure 6.Skewness and Kurtosis 7.Probability 8.Probability distribution 9.The normal distribution 10.Estimation 11.Hypothesis Testing 12.Analysis of Variance 13.Correlation and Regression Analysis

統計學(2)

本課程將教授統計學的基本概念、理論與應用，以期學習者可以利用統計學的觀念和方法，獲得合理的結論以解決問題，並透過實例，進行資料整理、分析並利用各種不同統計的方法以及適時使用統計軟體輔助資料分析。本課程的主要內容包含： 1.抽樣 2.抽樣分配 3.常態分配 4.估計 5.檢定 6.變異數分析 7.迴歸與相關分析

Statistics (2)

The major goal of the course is to help students construct the ability of using statistical method to solve problems under limited data and under uncertainty. The principle of statistics will be introduced in the course. Statistical software will be used in the course. Outline of the course include: 1.Sampling 2.Sampling Distribution 3.The normal distribution 4.Estimation 5.Hypothesis Testing 6.Analysis of Variance 7.Correlation and Regression Analysis

電子計算機概論(資管系免修)

本課程目的是要透過循序漸進的方式，引導學生習得電腦相關基本觀念與實務、多媒體互動程式設計，課程內容包含：文書處理軟體 Word 操作、簡報軟體 PowerPoint 操作、與試算軟體 Excel 操作 Scratch 軟體介紹、程式設計基本概念（循序結構、重複結構、選擇結構、變數、運算式）、遊戲技巧解析、腳本設計、音效錄製與編輯、與遊戲實作。

Introduction to Computers

This course intends to help students learn fundamental concepts and skills about computer related hardware and software. The topics covered include computer history, introduction of computer, digital system, multimedia, concepts about data and information management, operation systems, the Internet, Internet application, information safety and related laws, Microsoft Word, Excel, and PowerPoint software.

四、人文學院

心理學

本課程目的在於幫助學生探討人類行為與心智歷程；了解心理學的基本問題、理論、研究方法以及重要研究發現，俾使學生獲得一般心理學知識，並以為自修或研修其他行為科學的基礎。教學內容包括：心理的生理基礎，感覺與知覺，學習心理，身心發展，個別差異，動機與情緒，社會心理以及異常行為與心理治療。教學方式採講授、討論及分組撰寫報告三種同時進行。

Psychology

The purpose of this course is to study the human behaviors, personality and the mental processes. Fundamental problems, theories, research methods and major findings in psychology will be discussed. This introductory psychology course will develop basic knowledge and skills for further research in the social sciences. This course includes psycho-physiological foundation, sensation and perception, motivation and emotion, learning, human development, individual differences, social psychology, abnormal behaviors and psychotherapy. The teaching method includes lectures, discussions and group reports.

社會學(1)

此課程介紹社會學的觀點與理論，引導學生運用社會學觀點來分析日常的生活。課程重點包括：文化、社會化、社會不平等、偏差、社會控制、人口、集體行為、社會運動、社會變遷等。

Sociology (1)

This course is an introduction to the basic concepts and theories of sociology. It enables students to apply the sociological perspective to their daily lives. Topics include culture, socialization, social inequality, deviance, social control, population, collective behavior, social movement and social change.

電子計算機概論

本課程目的是要透過循序漸進的方式，引導學生習得電腦相關基本觀念與實務、多媒體互動程式設計，課程內容包含：文書處理軟體 Word 操作、簡報軟體 PowerPoint 操作、與試算軟體 Excel 操作 Scratch 軟體介紹、程式設計基本概念（循序結構、重複結構、選擇結構、變數、運算式）、遊戲技巧解析、腳本設計、音效錄製與編輯、與遊戲實作。

Introduction to Computers

This course intends to help students learn fundamental concepts and skills about computer related hardware and software. The topics covered include computer history, introduction of computer, digital system, multimedia, concepts about data and information management, operation systems, the Internet, Internet application, information safety and related laws, Microsoft Word, Excel, and PowerPoint software.

五、國際學院

實務專題

本課程在訓練學生運用適當之研究方法完成專題計畫。學生將以團隊合作方式進行資料蒐集、分析、論文撰寫、與專題發表。

Special Projects

This course aims to develop students' ability in completing research as well as cooperation work. Students will have to work as a group to finish a study with a special topic they choose. A final oral presentation will be held later this year.

生態學

課程講授生態學的基本概念，內容包含緒論、生態系統、生物與環境、族群生態、群落生態以及應用生態等項目。

Ecology

The purpose of this course is to study the basic concepts of ecology. Course contents include topics of ecosystems, organisms and environments, population ecology, community ecology, as well as applied ecology.

生物統計

本課程內容包括數據資料之特性及整理方式，並介紹敘述統計，各種分佈（包括常態、二項式、多項式、卜瓦松、t、F 分佈），信賴區間應用，各分佈之測試與應用，變方分析，迴歸與相關。

Biometry

The course first introduces data characteristics and management methods. Other main topics include the descriptive statistics, different distributions such as normal, binomial, polynomial, Poisson's, t, and F-distribution, confidence interval, comparing two means, analysis of variance, as well as regression and correlation analysis.

生物統計實習

本實習依上課進度進行對數據整理，敘述統計及各項分布（常態，二項式，多項式，卜瓦松，t，X，F 分布）信賴區間，以生物數據實例進行練習。變方分析應用，迴歸及相關利用。

Practice of Biometry

The lab. proceeds with the lecture of biostatistics, major focus will be on exercises of biological data management descriptive statistics and all distributions (Normal, binomial, polynomial, Poisson, t, X, and F). Application on confidence limits tests between population of different distribution analysis of variance, regression and correlations

統計學

本課程旨在使學生獲得機率與統計之相關知識，使其具有分析資料之能力。內容包括：統計概念、敘述統計、機率、機率分配、抽樣、估計、假設檢定、卡方檢定、迴歸分析、相關資料、變異數分析。

Statistics

The objective of this course is designed to teach the related knowledge of probability and statistics, and let students have the ability to analyze data. The main subjects are summarized as follows: Descriptive statistics, Probability, Probability distribution, Sampling, Estimation, Hypothesis test, Chi-square test, Analysis of variance, Regression analysis. Correlation analysis.

統計學實習

本實習目的係配合統計學教授課程內容與進度，學習資料搜集、轉換、軟體使用及統計推論等，利用電腦練習資料統計的分析過程，使學生有實際操作電腦使用軟體分析研究之資料。

Practice of Statistics

The objective of this practice is designed for students to use computer or electrical calculator for statistical analysis of investigation data. It includes the practice of data collection, transformation, statistical package used and statistical inference.

電子計算機概論

本課程目的是要透過循序漸進的方式，引導學生習得電腦相關基本觀念與實務、多媒體互動程式設計，課程內容包含：文書處理軟體 Word 操作、簡報軟體 PowerPoint 操作、與試算軟體 Excel 操作 Scratch 軟體介紹、程式設計基本概念（循序結構、重複結構、選擇結構、變數、運算式）、遊戲技巧解析、腳本設計、音效錄製與編輯、與遊戲實作。

Introduction to Computers

This course intends to help students learn fundamental concepts and skills about computer related hardware and software. The topics covered include computer history, introduction of computer, digital system, multimedia, concepts about data and information management, operation systems, the Internet, Internet application, information safety and related laws, Microsoft Word, Excel, and PowerPoint software.

永續發展趨勢

永續發展始終是在世界各地的一個大問題，尤其是在已發展國家。通過本課程，學生將學習永續發展概念和透過一些永續發展的關鍵問題而有不同的永續發展的觀點。學生將收集數據和資料，並群組討論有關永續發展在五大州地區和其它特定國家的情況。在這個課程過程中，學生將學習在世界各地的經濟、環境和社會方面的永續發展。

Trends in Sustainable Development

Sustainable development is always a big issue around the world, especially in the developed countries. Through this course, still will learn the concepts and different aspect of sustainable development through some key issues of sustainable development. Students will also collect data and information, they will discuss in group about situation of sustainable development in the continent level and also for a specific country. During this course, student will learn the economic, environmental and social aspects of sustainable development around the world.

六、獸醫學院

實務專題

本課程由教師輔導學生選定其有興趣之作物及試驗題目，進行田間栽培管理調查、植體分析或生產技術之操作或實驗室內之試驗、分析，並將實驗結果撰寫報告。

Special Projects

The students will select their crops (horticulture or agronomy) of interest and advisor with the speciality to instruct him. Course contents include either a laboratory research or cultural practice year round in the field for practical production, management, plant growth analysis techniques and the analysis of final results, report writing

普通化學(1)

本課程開設之目的為使學生學得化學之基本概念並熟悉化學的理論與計量方法，以奠定修習及研究後續相關科目的穩固基礎。其內容為：1.化學世界。 2.原子、分子及化合物。3.化學組成。4.化學反應。5.元素之週期性質。6.化學鍵結。7.氣體及液體特性。8.溶液。9.酸鹼平衡。10.氧化還原。

General Chemistry (1)

The course offers students basic concepts of chemistry and to enable them to know well the principles and methods of chemistry in order to build up the foundation of the other related sciences. The outlines are as below:1. The chemical world. 2. Atom, molecules, and compounds. 3. Chemical compositions. 4. Chemical reactions. 5. Periodic relationships among the elements. 6. Chemical bonding. 7. Properties of liquids and solids. 8. Solutions. 9. Acids and bases. 10. Oxidation and reduction.

普通化學實驗(1)

本課程開設之目標為訓練學生使熟悉各種化學之基本操作，並驗證各有關之化學原理。其內容為：1.安全及環保教育講習。 2. 混何物分離。 3.密度測量。 4. 質量守恆定律。 5. 化學式的測定。 6. 固體中水分測量。 7. 定組成定律。 8. 氧化還原反應。9. 溶液的配製。10. 氧化還原滴定。 11.化學平衡。 12.一酸及鹼之 pH 值測定。 13.酸鹼滴定。14. 滴定曲線繪製。

General Chemistry Lab. (1)

This course provides students a profound understanding of subject-matter from laboratory work and familiarity with basic laboratory technique. The outlines are as below: 1. Basic laboratory rules and safety. 2. Separation of mixtures. 3. Determination of density. 4. Law of conservation of mass. 5. Determination of empirical formula. 6. Determination of water content in solid. 7. Law of definite composition. 8. Oxidation-Reduction reactions. 9. Solution preparation. 10. Oxidation-Reduction titration. 11. Chemical equilibria. 12. Determination of pH. 13. Acid-Base titration. 14. Titration curve.

生物統計

本課程內容包括數據資料之特性及分析方式，並介紹敘述統計，各種分布(包括常態、二項式、多項式、卜瓦松、t、卡方、F等分布)、信賴區間應用、假設檢定與變方

分析等。

Biometry

The course introduces data characteristics and analysis methods. Other main topics include the descriptive statistics, different distributions such as normal, binomial, polynomial, Poisson, t, chi-square, and F-distribution, confidence interval applications, hypothesis testing and analysis of variance.

生物統計實習

本實習依上課進度進行對數據整理，敘述統計及各項分布(常態，二項式，卜瓦松，t，卡方，F分布)及其信賴區間，假設檢定以及變方分析，並以生物數據實例進行練習。

Practice of Biometry

This course is a practice lesson that follows the biostatistics course about data characteristics and analysis methods. Major focus will be on exercises of biological data for descriptive statistics, probability distributions (Normal, binomial, Poisson, t, chi-square, and F), confidence interval applications, hypothesis testing and analysis of variance.

生物技術

本課程旨在加強學生對生物技術之了解、其範圍涵蓋遺傳工程技術、細胞融合技術和蛋白質工程技術等三大領域的理論和臨床上應用等方面的學習，培養生物技術相關人才為目的。

Biotechnology

The curriculum will emphasize three major areas, including genetic engineering, hydridoma techniques and protein engineering. The purpose is to train students understanding the concept of biotechnology and their applications.

動物學

本課程之設計主要是幫助學生了解動物之演化、分類與生理功能，內容包括器官的發育、細胞分裂與遺傳、動物行為與生態、原生生物、假體腔動物、軟體動物、環節動物、節肢動物、昆蟲、魚類、兩生類、爬蟲類、鳥類、哺乳類。

Zoology

The object of this course is helping the students to understand the evolution, classification and physiological function of the animal. The contents include: development of tissue, organ, system, cell division and inheritance, animal behavior and ecology, protozoa, pseudocoelomate body plan, molluscan, annelida, arthropod, hexapod, fish, amphibian, reptile, bird and mammal.

動物學實習

本課程之設計主要是幫助學生學習動物的一般構造及功能，內容包括光學顯微鏡使用、動物細胞及原生生物外部構造之觀察、蚯蚓及蝦解剖構造之觀察、以及脊椎動物之循環、呼吸、排泄、生殖、肌肉、消化與骨骼等系統解剖構造的瞭解。

Practice of Zoology

The object of this course is helping the students to learn the general structure and function of animal. The contents include: utilization of light microscopy, observing the external features of animal cells and protozoas, observing the anatomic structures of pheretima, and crayfish, understanding the anatomic structures of circulatory, respiratory, excretory, reproduction, digestive, muscle and skeleton systems of vertebrates.

電子計算機概論

本課程目的是要透過循序漸進的方式，引導學生習得電腦相關基本觀念與實務、多媒體互動程式設計，課程內容包含：文書處理軟體 Word 操作、簡報軟體 PowerPoint 操作、與試算軟體 Excel 操作 Scratch 軟體介紹、程式設計基本概念（循序結構、重複結構、選擇結構、變數、運算式）、遊戲技巧解析、腳本設計、音效錄製與編輯、與遊戲實作。

Introduction to Computers

This course intends to help students learn fundamental concepts and skills about computer related hardware and software. The topics covered include computer history, introduction of computer, digital system, multimedia, concepts about data and information management, operation systems, the Internet, Internet application, information safety and related laws, Microsoft Word, Excel, and PowerPoint software.

各系(所)新增課程中英文摘要

一、 農學院

(一) 農園生產系：

作物栽培原理 2 選

本課程目的在於使學生瞭解作物生長發育與環境因子之關係，及栽培管理技術。內容包括作物之起源、分類、生長環境與分佈、栽培制度，以及栽種、施肥、灌溉、雜草、病蟲害及繁殖、採收、貯藏等栽培管理技術。

Principle of Crop Cultivation 2 E

The course is aimed at giving student a thorough understanding of the impacts of environmental factors and culture management technology on plant growth and development. Topics covered include the origin, classification, distribution of crops and their environmental requirements and cultural systems. Propagation, fertilization, irrigation, pest management, disease control, and post-harvest techniques will be introduced about each individual crop.

作物栽培實習 1 選

本課程係透過實地操作，使學生熟悉作物栽培之基本技能，諸如：作物種類及栽培方法之選定、農地整備、堆肥製作、生長管理、病蟲害及雜草防治實務等，使學生具備作物栽培之基本能力。

Principle of Crop Cultivation and Practice 1 E

The purpose of the course is to familiarize students with the basic farming techniques through hand-on field training, including the selection of crops and culture methods, land tilling, manure preparation, crop management, disease and weed control etc.

作物基因體工程入門 2 選

本課程目的讓學生入門瞭解作物性狀、發育、環境變化與栽培管理與作物核酸序列之間的關聯性，並了解作物基因組大數據之建立方式與應用情形。進而介紹作物基因組精確育種、栽培流程控制、品種與性狀檢定等應用之概念，且與基改作物比較兩者之發展現況。

Introduction of Genome Engineering in Crop 2 E

The course is aimed at giving student a thorough understanding about the relationship between genome and traits, environmental changes and culture management of crop, and to understand the establishment and application from the big data of genomic sequence. The concept of crop genome precision breeding, cultivation process control, variety and character verification are introduced through the genome engineering that compared with GM crop for the world development.

作物基因體工程實習 1 選

本課程係透過實地操作，使學生熟悉作物基因體工程之基本技能，諸如：作物性狀與遺傳分析方法之選定、核酸之萃取、資料庫建立與資料分析、生物資訊軟體操作、各項序列檢測分析、品種與性狀之鑑定以及相關性統計分析等，使學生具備作物基因體工程入門之基本能力。

Practice of Genome Engineering in Crop 1 E

The purpose of the course is to familiarize students with the basic genome engineering techniques through the selection of crop traits and genetic analysis methods, extraction of nucleic acids, database construction and data analysis, biological information software operation, the sequence detection analysis, traits identification and correlation statistical analysis etc.

花藝設計與應用

2 選

本課程目的:農園藝產品除了在傳統的用途，以目前現今社會發展的趨勢，有更多以人為出發點不同面向的應用；花藝設計的廣泛應用提高對於生活品質及美感的要求；植物抒壓的概念撫慰現今忙碌社會大眾的心靈，目前提倡的綠建築室內設計與我們在學校內的專業知識習習相關，讓學習知識轉化成商業化的應用，提升進入就業市場不同面向的優勢能力。

主要面向:

- 1.培養在農園藝產品商業行銷的市場敏感度。
- 2.激盪創新科技農業多面向思考範疇。
- 3.強化美學及人文素養。
- 4.學習新知識環境判斷思考連結的能力。

Floral Design and Application

2 E

As modern society evolves, the understanding of agriculture and horticulture has seen a shift from traditional utility view to a series of broader and more diversified approaches, focusing on people: the broader application of Flora Design to level one's view of living and aesthetic qualities; the interacting and soothing experience from plant ; or the increasingly popular concept of green architecture and designs. All these applications are deeply rooted in the professional knowledge we learned in the universities. This class aims at cultivating the ability to combine the horticulture profession with broader business sense, to prepare students with multi-dimensional vision in facing future careers. Main goals of the class:

- 1.To cultivate market sensibilities in business marketing of agriculture and horticulture products.
- 2.To encourage multi-dimensional thinking in combining technology innovation and agriculture
- 3.To enhance the sense of aesthetic and humanity, in seeing horticulture as a profession
- 4.To challenge and expose students to learning and linking new knowledge in different fields.

(二) 水產養殖系：

科技論文寫作專論

2 選

本課程將針對水產養殖科學領域，教導研究生科技論文寫作方法，以增進學生科技論文的寫作技巧，並應用於未來論文撰寫和成果發表。課程中，將著重論文寫作的準備及發表等，並教導學生如何有效、精確，且清楚的寫作，包括寫作的風格、策略及論文的結構等。另外，課堂中亦會教導學生搜尋文獻及回顧整理，並練習完成自定題目之科學文章寫作等。

Scientific Writing

2 E

This course aims to teach the fundamentals of effective scientific writing focused on the field of aquaculture in order to enhance skills of graduate students for writing scientific articles and future thesis, and research publication. Instruction will focus primarily on the process of writing and publishing scientific manuscripts. Therefore, students will be trained how to write effectively, concisely, and clearly, including the style, strategy and structure of article. Additionally, literature search and review are also introduced, and students will be

asked to complete an actual scientific manuscript of their choice in this course.

(三) 生物科技系：

植物細胞與組織培養

2 選

本課程主要介紹植物細胞與組織培養的常用操作技術及其應用方向，建立無菌培養的觀念及技術，以培育產業發展應用的人才。課程內容包括細胞全能性與型態發生、微體繁殖原理、遺傳與變異、基本植物組織培養技術、常用植物組織及器官培養方法、細胞培養方法、原生質體培養方法、原生質體融合、雜種細胞篩選與鑑定、雜交技術之應用、人工種子原理、技術與應用、超低溫保存原理、方法與檢測以及植物基因轉殖技術與應用等。

Plant Cell and Tissue Culture

2 E

This course is designed to introduce useful techniques and applications of plant cell and tissue culture. The sterile concepts and industrial application techniques are intended to be established in this course. The content includes totipotency and morphogenesis, the principles of micropropagation, genetics and variations, basic techniques of plant tissue culture, common techniques of plant tissue and organ culture, cell culture, protoplast culture and fusion, hybrid cell selection and identification, applications of hybrid cells, principles, techniques, and applications of artificial seeds, principles and techniques of cryopreservation, and techniques and applications of transgenic plants.

植物細胞與組織培養實驗

1 選

本課程主要為配合植物細胞與組織培養的實驗課程，實際操作常用之技術，同時建立無菌培養的觀念，以達到培育產業發展應用的人才的目的。課程內容包括無菌技術、培養基配製、癒合組織誘導、繼代培養、莖頂及根端培養、胚珠、胚芽、子房培養、花藥及花粉培養、細胞培養及原生質體培養、體細胞雜合及基因轉殖法等。

Experiment in Plant Cell and Tissue Culture

1 E

This experiment course is designed to practice commonly used techniques and to establish the sterile concepts of plant cell and tissue culture for incubation of talents in this field. The content includes aseptic techniques, medium preparation, callus induction, subculture, stem tip and root tip culture, ovule, embryo, and ovary culture, anther and pollen culture, cell culture, protoplast culture, somatic cell hybrid, and transgenic techniques.

(四) 動物科學與畜產系：

肉用草食家畜飼養管理實習

1 選

本課程主要提供學生更多肉用草食家畜之飼養管理實習機會。內容包括兔與羊之主要品種特性、營養與飼養、管理與設備、遺傳育種與繁殖技術、疾病防治與產品利用，畜舍規劃與市場經營等主題，並特別強調在本省地區之特殊環境下，如何經由學理與技術之應用，以調適經營及管理方法，提昇生產效率。

Practice of Meat-production Herbivorous Farm Animals Feeding and Management

1 E

The objective of this course is to provide students more practice opportunity for meat-production herbivorous farm animals. The major concepts of this course include: major breeds of rabbits and goats, their characteristics, principles of genetics, nutrition,

feeds and feeding, herd and reproductive managements, reproductive techniques, disease control, marketing, and management of products. The topics being put in the priority are those factors and techniques that are capable of being used for improving the efficiency of rabbits and goats production under the adverse environmental conditions.

二、 工學院

(一)機械工程系：

進階校外實習

9 選

為促進產學間技術與人才之交流，提升產學合作研發能量，增加學生校外實習機會，並為企業培育未來人才，特開設本課程。以期學生在畢業以前能深入了解業界生態，培養就業技能，並增進其職場競爭力。

Advanced Practice outside

9 E

The objective of the course is to promote the communication between business and school, increase students' opportunities of extracurricular intern and educate future engineers. We hope the students can comprehend the business environment, incubate their technological talents and improve their competitiveness before their education.

(二) 車輛工程系：

車輛振動力學

3 選

本課程旨在介紹如何以力學觀念來分析車輛結構的振動行為，使學生了解振動現象的原理與振動信號分析的方法，進而應用其理論與技術解決車輛工程的振動問題。課程內容包括：自由振動、強迫振動、離散系統模型、連續系統模型、時間與頻率響應、傅利葉分析以及結構穩定分析。

Mechanics of Vehicle Vibration

3 E

Mechanics of Vehicle Vibration will be investigated in this lecture. This course will introduce how to analyze the vibration behaviors on the concept of mechanics, and further be applied to solve the problems associated with the vibration of vehicle systems. Theoretical analysis includes free vibration, forced vibration, discrete system model, continuous system model, time and frequency responses, Fourier analysis and structural stability analysis.

三、 管理學院

(一)企業管理系：

企業資源規劃(1)

3 選

企業資源規劃系統(Enterprise Resource Planning System，簡稱 ERP 系統)，是一個以會計為導向的資訊系統，ERP 系統將企業內部所有資源整合在一起，對採購、生產、成本、庫存、分銷、運輸、財務、人力資源進行規劃，從而達到資源配置優化。ERP 系統整合整個企業資源，將原本企業功能導向的組織部門轉化為流程導向的作業整合，進而將企業營運的數據，轉化為有價值的資訊，以協助管理人員制定企業經營決策。本課程主要讓學生了解 ERP 系統的運用並實際操作 ERP 軟體，藉此讓學生具備運用 ERP 系統的能力，幫助學生增進職場競爭力。

Enterprise Resource Planning System(1)

3 E

The Enterprise Resource Planning System (ERP) is an accounting-oriented information system. The ERP system integrates all the resources within the enterprise. It integrates various business functions, such as purchasing, production, cost, inventory, distribution, transportation, accounting, finance and Human resources into one complete system, so as to achieve optimal allocation of resources. The ERP system transforms the original enterprise functional-oriented business unit into process-oriented operation integration, and then transform the data of business operations into valuable information to assist managers in making business decisions. This course addresses the utilization of ERP systems. It designs mainly for students to understand the use of ERP systems and the actual operation of ERP software, so that students have the ability to use ERP systems to improve their competitiveness in the workplace

企業資源規劃 (2)

3 選

企業資源規劃系統(Enterprise Resource Planning System，簡稱 ERP 系統)，是一個以會計為導向的資訊系統，ERP 系統將企業內部所有資源整合在一起，對採購、生產、成本、庫存、分銷、運輸、財務、人力資源進行規劃，從而達到資源配置優化。ERP 系統整合整個企業資源，將原本企業功能導向的組織部門轉化為流程導向的作業整合，進而將企業營運的數據，轉化為有價值的資訊，以協助管理人員制定企業經營決策。本課程主要讓學生了解 ERP 系統的運用並實際操作 ERP 軟體，藉此讓學生具備運用 ERP 系統的能力，幫助學生增進職場競爭力。

Enterprise Resource Planning System(2)

3 E

The Enterprise Resource Planning System (ERP) is an accounting-oriented information system. The ERP system integrates all the resources within the enterprise. It integrates various business functions, such as purchasing, production, cost, inventory, distribution, transportation, accounting, finance and Human resources into one complete system, so as to achieve optimal allocation of resources. The ERP system transforms the original enterprise functional-oriented business unit into process-oriented operation integration, and then transform the data of business operations into valuable information to assist managers in making business decisions. This course addresses the utilization of ERP systems. It designs mainly for students to understand the use of ERP systems and the actual operation of ERP software, so that students have the ability to use ERP systems to improve their competitiveness in the workplace

國際貿易實務

3 選

本課程以國際間商品買賣的原理及原則為核心，針對貿易實務的貿易條件的解釋、交易條件的內涵、契約成立的過程、契約條款的訂定要領等，使初學學生得以從國際交易的

接洽、報價、接受、訂約，通關、交貨、付款等過程能有一完整的觀念與實務能力，並於課程後具備基本國際貿易實務操作能力。

International Trade Practice 3 E

This course fundamentally aims to use international merchandise sell and purchase principle to introduce international trade terms, terms and condition of transaction, contract establishment, and contract conditions. It furthers will use the international trade concepts to introduce international trace contact, price inquiry/quotation, dealing with import/export contract, custom formalities, shipping and payment processes. Students are expected to have basic international trade practical skills after this course.

實務專題(1) 3 選

此課程培養學生基礎實務能力,藉由在學中所學理論與實作加以應用與實現。

Special Projects(1) 3 E

The goal of this course is to educate thhe basiic ability of technology throughh learning theory and its applied skills.

實務專題(2) 3 選

此課程培養學生基礎實務能力,藉由在學中所學理論與實作加以應用與實現。

Special Projects(2) 3 E

The goal of this course is to educate thhe basiic ability of technology throughh learning theory and its applied skills.

大數據分析的行銷應用 3 選

本課程目的在使學生了解商業數據分析的基礎概念與資料庫行銷的應用，以掌握行銷市場預測的有效前測，透過跨產業資料探勘標準流程與模式的建立，進行有效的模式效能評估，提供即時的商業分析以支援精準的目標行銷，建立預防顧客流失的預測模式，有助於社群網站與口碑行銷的有效經營。本課程實務與理論並重，學理部分將說明資料探勘技術在商管領域的應用，其中包含購物籃分析(網拍購物車)、分群技術(消費傾向分群)、決策樹演算法(信用卡申請預測)、鑑別分析(消費者指紋辨識)、資料預測與羅吉斯迴歸(線上零售業)、文字探勘與網頁探勘(時事議題分析)等商業應用。實務部分將以上機實作方式進行個案公司的實際數據分析，以熟悉資料探勘軟體的應用及 R 語言程式的撰寫練習，並以社群口碑資料庫進行網路口碑及線上輿情分析的資料探勘。

Big Data Analysis in Marketing Application 3 E

The purpose of this course is to help students to understand the basic concepts of business data analysis and applications in marketing. In order to get effective marketing forecast, through creating a standard process of data exploration industry and effective assessment method of model, providing real-time business analysis to support marketing target, preventing customers' loss, contributing to the community website and effective word of mouth marketing. This course has both theory and practice. The theoretical part will explain the applications of data exploration technology in business management field, including shopping cart analysis (shopping cart), clustering analysis (grouping consumption tendency), decision tree algorithm (credit card application), identification analysis (consumer fingerprint identification), regression analysis (online retail), text survey and web exploration (current affairs issues analysis) and other commercial applications. The practical part is analysis implementation of actual cases

of company's database, familiar with applications of data exploration software and R program software. And, applications in database of online community reputation and online data exploration will be mentioned.

(二)資訊管理系：

計算機結構

3 選

課程由了解指令集架構(instruction set architecture)的設計開始，分辨簡單指令集電腦(RISC)和複雜指令集電腦(CISC)的不同與優劣之處。進一步再去學習電腦中各個部份的設計原理，各個部份之間的相互關係，以及電腦整體運作的效能。從電腦的運作原理進而了解軟硬體各部分的機能，軟硬體模組之間的互動和影響，延伸理解行動裝置和雲端系統的設計方式，進而學習如何針對一般或特定應用設計出最佳的計算機系統。課程內容將涵蓋向量處理器結構(Vector Architecture)、單指令流多數據流結構(SIMD Architecture)、和圖形晶片的硬體架構(GPU Architecture)，到提高執行緒層次平行度(Data-Level Parallelism)的多核心架構並說明多核心架構下共享記憶體所面臨的問題，以及解決策略。

Computer Architecture

3 E

The course begins by understanding the design of the instruction set architecture and the differences between the reduced instruction set computing (RISC) and the complex instruction set computing (CISC). And then go to learn the various design principles of the computer, the relationship between the various parts, as well as the overall operation of the computer's performance. From the understanding of computer design principles, the various parts of the hardware and software functions, and hardware and software modules, the student can learn the design of mobile devices and cloud system. Moreover, they can learn how to design the best computer system for general or specific applications. The course includes vector architecture, SIMD architecture, multi-core architecture under data level parallelism, the problems of the shared memory under the multi-core architecture, as well as the solution strategy.

(三)時尚設計與管理系：

原住民文化創作保護與設計應用

3 選

原住民族傳統文化與藝術，如：宗教祭儀、音樂、舞蹈、歌曲、雕塑、編織、圖案、服飾、民俗技藝等，深具特色。這課程主要教導學生如何保護原住民傳統文化，以及將其運用在時尚設計。課程內容包含：原住民文化、智慧財產權、文化資產保護、文化創意產業、織品設計、服裝設計、彩妝設計等。

Protection of Aboriginal Culture Creation and Design Application

3 E

Aboriginal traditional culture and art have unique characteristics. Such as religious rituals, music, dance, songs, sculpture, weaving, patterns, clothing, folk art and so on. This course aims to help students learn how to protect Aboriginal traditional culture and use it in fashion design.

The course contains: Aboriginal culture, intellectual property rights, cultural asset protection, cultural and creative industries, fabric design, costume design, and makeup design.

四、 人文暨社會科學院

(一)人文暨社會科學院：

手機應用程式設計

2 選

本課程是要幫助學生學習如何發展智慧型手機程式設計，發展工具採用 Android APP Inventor 引導學生創建簡單的應用程式。課程內容包括：手機應用程式設計、圖控式語法、APP 專題實作。

Mobile Application design

2 E

This course is to help students learn how to development of smartphone programing. The development is using Android App Inventor allows students to create simple applications. The course contains: Mobile App design, blocks language, APP topics implementation.

(二)幼兒保育系：

兒童產業教材實務

2 選

本課程旨在探討兒童產業之相關實務教材及教保活動運用，除了引導學生瞭解多元化的兒童產業實務教材，並進一步探析兒童產業多元教材特色與運用方式，進而學習選擇與組織適切的兒童產業教材、教具及素材，於教保活動實務中運用。期能引導學生探討、發掘兒童產業多元教材與運用之相關實務議題及其發展趨勢。

Practice of Children Industry Teaching Materials

2 E

In this course we will be exploring the multiple teaching materials for the children industry as well as to learn how to choose and organize appropriate teaching materials in teaching activities. In this course we will also help students to understand the trends of children industry multiple teaching materials.

(三)社會工作系：

論文寫作與學術研究倫理

2 選

社會工作研究是一種應用社會研究的方法來探討瞭解社會問題，進而解決或舒緩問題對於社會工作服務對象的影響，改善並提升其生活品質，以達社會正義之目的。因此，社會工作研究屬於行為社會科學研究領域，其所運用的研究方法及研究倫理規範亦受到行為及社會科會所影響。教育部於 2014 年起推動「校園學術倫理教育與機制發展計畫」，為培養高等教育師生良好的學術倫理涵養，確保學術活動的合宜性及合法性，以精進學術研究品質，藉此亦可減少並避免違返學術倫理的事件產生。有鑑於此，本課程著重於如何導引學生透過近幾年的案例來提昇學生重視學術倫理並瞭解其引發的後續問題，同時藉由帶領學生書寫／評論論文，培養其具備科學性論文計畫撰寫之基礎能力。

Thesis Writing and Academic/Research Ethics

2 E

This course would help research students to understand the standards of integrity and accountability in the conduct of academic research and is keen to embed and endorse a culture of honesty and transparency in all its institutional activities. In addition, the students can learn how to access information and search the scholarly literature, cite and document sources properly and prepare a formal research thesis

性別與醫療：

2 選

本課程目標為幫助學生認識多元性別文化，及了解醫療專業中的性別關係，教學內容以性別教育為橫軸，以醫療議題為縱軸，藉由探析性別意識型態，幫助學生能覺察自我如何在習焉不察、理所當然的社會常規、文化風俗和社會結構之中運作與影響。本課程著重學生日常生活經驗中人

與人，人與環境，文化與文化之間的差異中各種研究議題。

Gender and Medicine

2 E

The goal of this course is to help students recognize the multivariate gender culture and understand gender relations within medical professions; the content of this course is focusing on gender education and medical issues via exploring gender awareness patterns, which help students to be able to perceive self judgment without the culture custom influences, social practices, community assumptions. This course focuses on the students' daily integrations between people, the environment, culture and cultural differences as the research topics.

預防醫學

2 選

正確的醫學知識是做為一個現代化知識分子所必須具備的。本課程請各方面的專家，就日常生活保健或容易碰到的健康問題，從生理及心理層面，做深入淺出的介紹，以期大學生能獲得正確的醫學觀念。

Preventive Medicine

2 E

The correct medical knowledge is a must have as a modern intellectuals. This course please experts in various fields, the care of their daily lives or likely to encounter health problems, from physical and psychological, to do simple introduction to university students can get proper medical concepts.

(四)休閒運動健康系：

水中有氧運動與指導

2 選

本課程之目的在於教導學生能安全並有效之水中有氧訓練介入方式。讓學生了解水中有氧的運動特性、強度、能量消耗、持續時間、水中有氧基礎動作、與課程安排，並有助於日後開立針對老人運動介入之訓練活動設計與實務技能。

Practice and Guidance for Aqua Aerobics

2 E

The purpose of this course is to guide students to be able to teach aqua aerobic courses safely and effectively. Also, students have to understand the characteristics, intensity, duration, basic movements, and course arrangement of aqua aerobic. By doing so, students will be able to have the capacities of designing and practicing aqua aerobic courses for elderly.

單車領隊導遊實務

2 選

單車旅遊是最能夠體驗在地風情的方式之一，本課程的目的在使學生了解單車遊程的規劃、基礎的維修能力及行前準備等單車領隊導遊實務事宜。

Practice for Bike Leader and Guide

2 E

Bike tourism is one of the best ways to experience the local customs. This course is to help students learning the bike leader and guide's practice to plan a bike tour, basic maintenance capability and the preparation of various matters before tour starts.

單車保養與維修實務

2 選

單車早期為代步用的工具，發展至今已經成為一項多元的運動器材，本課程的目的在使學生了解如何選擇單車與騎乘設定、單車機械運作的原理以及保養維修。

Practice for Bike Maintenance and Repair

2 E

Bikes were used as transport means in early days. Nowadays, it has become one type of diverse sports equipment. The purpose of this course is to enable students to learn how to choose bikes, fittings, the theory of mechanical operation and the maintenance.

(五)應用外語系：

進階英語檢定訓練 0 選

本課程旨在透過密集的英語能力檢定模擬測驗，提升學生英語能力及強化學生應試技巧，以期學生於畢業前順利通過本系之英文門檻。

English Proficiency Training 0 E

This course aims to enhance students' English proficiency and exam-taking skills through intensive simulation tests in class. By the end of the course, students are expected to be able to meet the English proficiency requirement for graduation.

英語檢定訓練： 0 選

本課程旨在幫助學生通過系上英檢門檻。

Advanced English Proficiency Training 0 E

This course aims to help students prepare for English proficiency exams, a postgraduate English graduation threshold required by the Department of Modern Languages.

傳閱附件 2-5--本校各學院所屬各系(所)課程中英文摘要-國際學院

五、 國際學院

(一)國際學院：

進階專技英文寫作

2 選

為提升學生閱讀英文專業文獻及專作英文摘要之能力而設計此一課程。內容分兩部分，先自國內學子易犯之造句錯誤著手，繼而要求短句之寫作練習，第二部分則是文獻之分析式導讀，期使學生修完課後極易瞭解英文專業文獻並能述寫短文。

Advanced Scientific Writing in English for Chinese Authors

2 E

To enhance students' ability accurately and clearly understand scientific papers published in English language journals. Particular emphasis will be given to the analysis of subject and verb use in the sentences. Short writing assignments will be given to assess student understanding.

傳閱附件 2-6--本校各學院所屬各系(所)課程中英文摘要-獸醫學院

六、 獸醫學院

(一) 獸醫學系：

實用外科學

2 選

本課程為小動物外科學的延伸課程，教學目的在於讓學生能將課堂上習的知識融會貫通，並以實際臨床病例進行實務教學。

Apply Surgery

2 E

This course is the extension of small animal surgery. The purpose is to help the students achieve mastery through a comprehensive study of the subject. Besides, the clinical cases will be utilized for teaching in class.

臨床禽病學(1)

2 選

本課程為家禽醫學專科醫師養成教育之第一年基礎課程。本課程進行家禽健康管理相關知識與技術之講授與討論。授課內容包括家禽傳染及非傳染性疾病診療、家禽群體健康管理、家禽生產及現場群體健康診療等技術之基礎訓練。

Clinical Poultry Medicine (1)

2 E

This course is designed for the first-year graduate students planning to specialize in poultry medicine. Participants will be provided with lectures and discussion regarding the knowledge and skills in poultry health management. The contents of this course include the clinical training in the diagnosis, treatment and control of individual infectious and non-infectious poultry disease, poultry flock health management, poultry production, and on-farm poultry flock health and disease control program.

臨床禽病學(2)

2 選

本課程為家禽醫學專科醫師養成教育之第一第一年基礎課程。本課程進行家禽健康管理相關知識與技術之現場實習、講授與討論。授課內容包括家禽傳染及非傳染性疾病診療、家禽群體健康管理、家禽生產及現場群體健康改善等新技术之訓練課程。

Clinical Poultry Medicine (2)

2 E

This course is designed for the first-year graduate students planning to specialize in poultry medicine. Participants will be provided with lectures and discussion regarding the knowledge and skills in poultry health management. The contents of this course include the clinical training in the diagnosis, treatment and control of individual infectious and non-infectious poultry disease, poultry flock health management, poultry production, and on-farm poultry flock health and disease control program.

臨床禽病學特論(1)

2 選

本課程為家禽醫學專科醫師養成教育之第二年課程，本課程進行家禽健康管理相關知識與技術之講授與討論。授課內容著重於教導學生獨立從事禽病診療及群體健康管理工作、特定新浮現或重要禽病之診斷與預防控新技術。

Special Topics in Clinical Poultry Medicine (1)

2 E

This course is designed for the second-year graduate students planning to specialize in poultry medicine. Participants will be provided with lecture and discussion regarding the knowledge and skills in poultry health management. The contents of this course will be emphasized on the training of the specialists in independently conducting the diagnosis, treatment and control of poultry diseases, familiar with the new technology in flock health management, and the diagnosis and control of the newly emerged or important poultry diseases.

臨床禽病學特論(2)**2 選**

本課程為家禽醫學專科醫師養成教育之第二年課程，本課程進行家禽健康管理相關知識與技術之講授與討論。授課內容著重於教導學生獨立從事禽病診療及群體健康管理工作、特定新浮現或重要禽病之診斷與預防控制新技術。

Special Topics in Clinical Poultry Medicine (2)**2 E**

This course is designed for the second-year graduate students planning to specialize in poultry medicine. Participants will be provided with lectures and discussion regarding the knowledge and skills in poultry health management. The contents of this course will be emphasized on the training of the specialists in independently conducting the diagnosis, treatment and control of poultry diseases, familiar with the new technology in flock health management, and the diagnosis and control of the newly emerged or important poultry diseases.

家禽醫學診療實習(1)**1 選**

本課程為家禽醫學專科醫師養成教育之第一年基礎課程，以本校動物疾病診斷中心及台灣各養禽場之家禽為實習對象，進行家禽健康管理相關知識與技術之現場實習。授課內容包括家禽傳染及非傳染性疾病診療、家禽群體健康管理、家禽生產及現場群體健康診療等技術之基礎訓練。

Clinical Practice in Poultry Medicine (1)**1 E**

This course is designed for the first-year graduate students planning to specialize in poultry medicine. Participants will be provided with clinical practice regarding the knowledge and skills in poultry health management. Animals involved in the clinical practice include the poultry registered in the Animal Disease Diagnostic Center at NPUST and the animals from poultry farms in Taiwan. The contents of this course include the clinical training in the diagnosis, treatment and control of individual infectious and non-infectious poultry disease, poultry flock health management, poultry production, and on-farm poultry flock health and disease control program.

家禽醫學診療實習 (2)**1 選**

本課程為家禽醫學專科醫師養成教育之第一年基礎課程，以本校動物疾病診斷中心及台灣各養禽場之家禽為實習對象，進行家禽健康管理相關知識與技術之現場實習。授課內容包括家禽傳染及非傳染性疾病診療、家禽群體健康管理、家禽生產及現場群體健康診療等技術之基礎訓練。

Clinical Practice in Poultry Medicine (2)**1 E**

This course is designed for the first-year graduate students planning to specialize in poultry medicine. Participants will be provided with clinical practice regarding the knowledge and skills in poultry health management. Animals involved in the clinical practice include the poultry registered in the Animal Disease Diagnostic Center at NPUST and the animals from poultry farms in Taiwan. The contents of this course include the clinical training in the diagnosis, treatment and control of individual infectious and non-infectious poultry disease, poultry flock health management, poultry production, and on-farm poultry flock health and disease control program.

家禽醫學診療實習(3)**1 選**

本課程為家禽醫學專科醫師養成教育之第二年課程，以本校動物疾病診斷中心及台灣各養禽場之家禽為實習對象，進行家禽健康管理相關知識與技術之現場實習。授課內容包括家禽傳染及非傳染性疾病診療、家禽群體健康管理、家禽生產及現場群體健康改善等新技術之訓練課程。學生亦參與獸醫學系大學部學生「診療實習」之教學訓練。

Clinical Practice in Poultry Medicine (3)**1 E**

This course is designed for the second-year graduate students planning to specialize in poultry medicine. Participants will be provided with clinical practice regarding the knowledge and skills in

poultry health management. Animals involved in the clinical practice include the poultry registered in the Animal Disease Diagnostic Center at NPUST and the animals from poultry farms in Taiwan. The contents of this course include the advanced clinical training in the diagnosis, treatment and control of individual infectious and non-infectious poultry disease, poultry flock health management, poultry production, and on-farm poultry flock health and disease control program. The graduate students will be expected to participate in the teaching of the undergraduate course of clinical practice in poultry diseases.

家禽醫學診療實習 (4)

1 選

本課程為家禽醫學專科醫師養成教育之第二年課程，以本校動物疾病診斷中心及南部各家禽場之家禽為實習對象，進行家禽健康管理相關知識與技術之現場實習。授課內容包括家禽傳染及非傳染性疾病診療、家禽群體健康管理、家禽生產及現場群體健康改善等新技术之訓練課程。學生亦參與獸醫學系大學部學生「診療實習」之教學訓練。

Clinical Practice in Poultry Medicine (4)

1 E

This course is designed for the second-year graduate students planning to specialize in poultry medicine. Participants will be provided with clinical practice regarding the knowledge and skills in poultry health management. Animals involved in the clinical practice include the poultry registered in the Animal Disease Diagnostic Center at NPUST and the animals from poultry farms in Taiwan. The contents of this course include the clinical training in the diagnosis, treatment and control of individual infectious and non-infectious poultry disease, poultry flock health management, poultry production, and on-farm poultry flock health and disease control program. The graduate students will be expected to participate in the teaching of the undergraduate course of clinical practice in poultry diseases.

臨床病例討論(1)

2 選

本課程將進行實際臨床病例之討論，並輔以最新文獻或研討會之資訊，幫同學增進小動物臨床之概念。

Clinical case discussions (1)

2 E

The course is aim to improve the practical knowledge of small animal medicine, including internal medicine, surgery, and diagnostic imaging.

臨床病例討論(2)

2 選

本課程將進行實際臨床病例之討論，並輔以最新文獻或研討會之資訊，幫同學增進小動物臨床之概念。

Clinical case discussions (2)

2 E

The course is aim to improve the practical knowledge of small animal medicine, including internal medicine, surgery, and diagnostic imaging.

臨床病例特論(1)

2 選

本課程以討論本校動物醫院臨床病例的方式，從區別診斷、治療方式及預後的追蹤讓學生對疾病治療有充分的瞭解。

Special topics in clinical cases (1)

2 E

This lecture will discuss the clinical cases from veterinary medical teaching hospital, NPUST. By realizing the complete procedures of differential diagnosis, treatment strategy selecting, and prognosis following, the students can understand how to treat the disease practically.

臨床病例特論(2)

2 選

本課程以討論本校動物醫院臨床病例的方式，從區別診斷、治療方式及預後的追蹤讓學生對疾病治療有充分的瞭解。

Special topics in clinical cases (2)

2 E

This lecture will discuss the clinical cases from veterinary medical teaching hospital, NPUST. By realizing the complete procedures of differential diagnosis, treatment strategy selecting, and prognosis following, the students can understand how to treat the disease practical.

伴侶動物診療技術特論

2 選

本課程以互動方式討論臨床伴侶動物診療技術，並藉由參與研討會的方式進行校外教學，會後小組討論的方式將最新臨床知識活用於實際的診療工作上。

Special topics in companion animal' s therapy

2 E

This lecture will discuss the companion animal' s therapy with students interactively. Besides, the field trip will be done by attending the conference. After the conference, the group discussion will be preceded and the latest clinical information could be applied on daily practice.

傳閱附件 3--食品科學系「科技農業組」學士學位學程課程規劃案

四年制 食品科學系科技農業組

(一)教育目標

- 一、培育食品科學理論與實務並重的專業人才為重心，並促進多元文化學習，提升學生學習效率與品質，加強學生基礎學科及語文能力，促進國際學習交流，使其畢業後即可投入職場。
- 二、以果樹、蔬菜、花卉、農藝、特藥用作物及園林景觀為主軸，建立熱帶農業科技基礎能力。配合產業趨勢、培育學生具備栽培管理、生理、育種改良、生物科技及園產品處理等基本專業技術。培育兼具現代科學基礎理論、應用、生產技術及永續經營之專業實務人才。
- 三、配合國內、外水產養殖相關產業脈動、國家教育目標與政策及本校發展計畫，規劃聯貫性課程，培育學生具有社會道德倫理與專業素養、訓練學生具有水產繁養殖與育種、飼料與營養、產銷經營管理、資源保育與永續利用等專業知識與應用技能，使學生具有創業或服務相關產業之能力。
- 四、培育學生農企業管理之基本專業知識與技能，訓練學生農企業理論與實務相互配合之能力，培育具備企業倫理與團隊合作精神之農企業管理人才，培養學生國際觀，增進未來就業潛能。

(二)校定共同必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
通識課程 General Education	12	2	2	2	2	2	2			
通識教育講座 Lectures on General Education	1			1						各系依序開課，開課學期不定
國文(閱讀與寫作)(1) Chinese(Reading and Writing)(1)	2	2								
國文(閱讀與寫作)(2) Chinese(Reading and Writing)(2)	2		2							
憲法 Constitution	2		2							
外語實務 Foreign Language Proficiency Test	0	0								
大一英文(1) Freshman English(1)	2	2								
大一英文 (2) Freshman English(2)	2		2							
大一體育(1) Freshman P.E.(1)	1	1								
大一體育(2) Freshman P.E.(2)	1		1							
英語聽講練習 101~102 English Listening & Speaking Practice 101~102	2	1	1							
合 計	27	8	10	3	2	2	2	0	0	

(三)學院共同必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
普通化學(1) General Chemistry (1)	3	3								
普通化學實驗(1) General Chemistry Lab (1)	1	1								
生物統計 Biometry	2			2						
生物統計實習 Biometry Lab.	1			1						
實務專題 Practical Projects	2							1	1	
合 計	9	4	0	3	0	0	0	1	1	

(四)專業必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
園藝學 Introduction to Horticultural Science	2		2							農園生產系
作物病蟲害管理與診斷 Management and Identification Techniques of Plant Diseases and Insect Pests on Crop Plant	2					2				農園生產系
作物病蟲害管理與診斷實習 Management and Identification Techniques of Plant Diseases and Insect Pests on Crop Plant Lab.	1					1				農園生產系
農業機械 Agricultural Machinery Operation	2	2								農園生產系
農業機械實習 Practice of Agricultural Machinery Operation	1	1								農園生產系
作物學 Science of Field Crops	2	2								農園生產系
水產養殖學 Introduction to Aquaculture	2			2						水產養殖系
水產繁殖學 Fish Breeding & Propagation	2					2				水產養殖系
水產飼料學 Fish Feed Formulation and Processing Techniques	2						2			水產養殖系
食品加工 Food Processing	2		2							食品科學系
食品加工實習 Food Processing Lab.	1		1							食品科學系
微生物學 General Microbiology	2				2					食品科學系
微生物學實習 General Microbiology Lab	1				1					食品科學系
食品衛生與安全 Food Hygiene and Safety	3					3				食品科學系
農企業管理 Agribusiness Management	2		2							農企業管理系
休閒農業 Leisure Agriculture	2				2					農企業管理系
農產行銷 Marketing of Agricultural Products	2				2					農企業管理系

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
農業生物科技產業概論 Introduction to Agricultural Biotechnology industry	2				2					農企業管理系
農業發展與政策 Taiwan Agricultural Development and Policy	2					2				農企業管理系
農業自動化 Agricultural Automation	2					2				農企業管理系
農業概論 Introduction to agriculture	2	2								農企業管理系
農場實習	6	1	1	1	1	1	1			農企業管理系
財務分析及診斷	2				2					農企業管理系
農場簿記	2					2				農企業管理系
自家農場實習 Practice of Home Farm	16							8	8	
合 計	65	8	8	3	12	15	3	8	8	

(五)專業選修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
糧食作物學 Food Crop	2	2								農園生產系
糧食作物學實習 Practice of Food Crop	1	1								農園生產系
蔬菜學 Olericulture	2		2							農園生產系
蔬菜學實習 Practice of Olericulture	1		1							農園生產系
設施園藝 Horticultural Production under Structures	2			2						農園生產系
設施園藝實習 Practice of Horticultural Production under Structures	1			1						農園生產系
果樹學 Pomology	2				2					農園生產系
果樹學實習 Practice of Pomology	1				1					農園生產系
花卉學 Floriculture	2					2				農園生產系
花卉學實習 Practice of Floiriculture	1					1				農園生產系
遺傳學 Genetics	2					2				農園生產系
遺傳學實習 Practice of Genetics	1					1				農園生產系
特用作物學 Special Crops Science	2						2			農園生產系
特用作物學實習 Practice of Special Crops Science	1						1			農園生產系
農業氣象 Agricultural Meteorology	2						2			農園生產系
土壤與肥料 Soil and Fertilizer	2				2					農園生產系
有機農業概論 General Discussion of Organic Farming	2			2						農園生產系
農園產品處理學 Postharvest Technology of Agricultural Products	2					2				農園生產系

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
農園產品處理學實習 Practice of Postharvest Technology of Agricultural Products	1					1				農園生產系
植物繁殖技術 Plant Propagation Techniques	2						2			農園生產系
植物繁殖技術實習 Practice of Plant Propagation Techniques	1						1			農園生產系
水質學 Analysis of Water Quality	2		2							水產養殖系
水質學實習 Water Quality Analysis in Aquaculture Lab.	1		1							水產養殖系
水產養殖學實習 Practice of Aquafarm	1		1							水產養殖系
餌料生物學 Cultivation of Living Organisms	2			2						水產養殖系
餌料生物學實習 Cultivation of Living Organisms Lab.	1			1						水產養殖系
水產繁殖學實習 Fish Breeding & Propagation Lab.	1				1					水產養殖系
水產飼料學實習 Fish Feed Formulation and Processing Techniques Lab.	1					1				水產養殖系
魚病學實習 Practice of Fish Diseases	1						1			水產養殖系
觀賞魚養殖與管理 Culture and Management of Ornamental Fish	2					2				水產養殖系
觀賞魚養殖與管理實習 Practice of Culture and Management of Ornamental Fish.	1					1				水產養殖系
食品行銷 Food Marketing	2				2					食品科學系
發酵學 Fermentation	2						2			食品科學系
發酵學實驗 Fermentation Lab	1						1			食品科學系
食品生鮮處理技術 Post-harvest Technology	2					2				食品科學系

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
食品生鮮處理技術實習 Post-harvest Technology Lab.	1					1				食品科學系
農企業管理資訊系統 Agribusiness Management Information Systems	2					2				農企業管理系
畜牧經營	2			2						農企業管理系
畜牧經營實習	1			1						農企業管理系
溝通與領導 Communication and Leadership	2						2			農企業管理系
農企業營運計畫撰寫 Writing for Agribusiness Operate Prospectus	2						2			農企業管理系
大陸經貿與農企業 The Economy and Agribusiness in Mainland China	2						2			農企業管理系
農產品貿易實務 Agricultural Products Trade Practice	2						2			農企業管理系
合 計	67	3	7	11	8	18	20	0	0	

六、課程中英文摘要

(一)院訂必修課程

62001 普通化學 (1) (3 必)

普通化學教學小組，下

本課程開設之目的為使學生學得化學之基本概念並熟悉化學的理論與計量方法，以奠定修習及研究後續相關科目的穩固基礎。其內容為：1.度量，有效數字及其運算。2.原子、分子及離子。3.質量關係。4.水溶液中之反應。5.氣體。6.熱化學。7.量子學說及原子電子結構。8.元素之週期性質。

362001 General Chemistry (1) (3R) General Chemistry Teaching Group, S

The course offers students basic concepts of chemistry and to enable them to know well the principles and methods of chemistry in order to build up foundation for study of the other related sciences. The outlines are as below:1.The study of change. 2.Atom,molecules, and ions. 3.Mass relationships in chemical reactions. 4.Reactions in aqueous solution. 5.Gases. 6.Thermochemistry. 7.Quantum theory and the electronic structure of atoms .8.Periodic relationships among the elements.

362002 普通化學實驗 (1) (1 必)

普通化學實驗教學小組，下

本課程開設之目標為訓練學生使熟悉各種化學之基本操作，並驗證各有關之化學原理。其內容為：1.實驗室安全規則。2.玻璃加工。3.密度測定。4.固液分離。5.加熱法。6.質量不減定律。7.混合物中各成分的分離。8.定組成定律。9.化學式的測定。10.化學計量。11.固體中水份的測定。12.利用蒸氣密度測定分子量。13.固體溶解度與溫度的關係。14.氣體定律。15.空氣中主要成分的測定。

362002 General Chemistry Lab (1) (1R) General Chemistry Lab Teaching Group, S

This course provides students a profound understanding of subject-matter from laboratory work and familiarity with basic laboratory technique. The outlines are as below:1.Safety in laboratory. 2.Glass working. 3.Determination of density.4.Separation of liquid and solids. 5.Heating. 6.Separation and purification by physical methods. 7.Law of conservation of mass. 8.Law of definite composition. 9.Determination of molecular formula. 10.Stoichiometry. 11.Water of hydration. 12.Molecular weight of a vapor by the Dumas method. 13.Solid solubility and temperature. 14.The gas law. 15.Determination of air components.

012009 生物統計 (2 必)

陳兆鉞、謝清祥、楊月玲

本課程內容包括數據資料之特性及整理方式，並介紹敘述統計，各種分佈(包括常態、二項式、多項式、卜瓦松、 t 、 F 等分佈)，信賴區間應用，各分佈之測試與應用，變方分析，迴歸與相關。

012009 Biometry Yang (2R)

C. Y. Chen、C.H. Hsieh Y. L.

The course first introduces data characteristics and management methods. Other main topics include the descriptive statistics, different distributions such as normal, binomial, polynomial, Poisson's, t , F , and F -distribution, confidence limits applications, tests and applications of all distributions, analysis of variance, as well as regression and correlation analysis.

012010 生物統計實習 (1 必)

謝清祥、楊月玲、陳兆鉞

本實習依上課進度進行對數據整理，敘述統計及各項分布(常態，二項式，多項式，卜瓦松， t ， X ， F 分布)信賴區間，以生物數據實例進行練習。變方分析應用，迴歸及相關利用。

012010 Practice of Biometry (1R)

C. Y. Chen、C. H. Hsieh、Y. L. Yang

The lab. proceeds with the lecture of biostatistics, major focus will be on exercises of biological data management descriptive statistics and all distributions (Normal, binomial, polynomial, Poisson, t , X , and F). Application on confidence limits tests between population of different distribution analysis of variance, regression and correlations.

012013 實務專題 (2 必)

本課程由教師輔導學生選定其有興趣之作物及試驗題目，進行田間栽培管理調查、植體分析或生產技術之操作或實驗室內之試驗、分析，並將實驗結果撰寫報告。

012013 Special Project (2R)

The students will select their crops (horticulture or agronomy) of interest and advisor with the speciality to instruct him. Course contents include either a laboratory research or cultural practice year round in the field for practical production, management, plant growth analysis techniques and the analysis of final results, report writing.

自家農場實習 Practice of Home Farm

本課程係透過自家農場實地操作，使學生熟悉農場生產、加工、銷售等之基本技能，諸如：作物種類及栽培方法之選定、農地整備、堆肥製作、生長管理、病蟲害、防治及畜牧場的管理實務等，使學生具備農場經營管理(產、製、銷)之基本全備能力，以建立學生對未來從事農業所需知識技能的最好準備。

Students learn the basic farming techniques through field training, such as the selection of crops and culture methods, land and manure preparation, crop management, disease and weed control etc. Students will also enrich their knowledge in clean culture, management and market.

(二)農園生產系 Department of Plant Industry

(1)必修科目 Required Courses

112001 園藝學 (2 必)

何韻詩、陳麗筠劉、福隆

這是門概論課程，介紹園藝作物：果樹、蔬菜、花卉的生產、處理、和利用原理；觀賞植物在景觀和環境上的運用。認識相關的科技與產業，它們在經濟上的重要性和在國內的分布情況。了解園藝栽培在世界上對於提供養分和食物，改善環境生活品質，美化景觀，及醫藥利用上所扮演的角色。

112001 Introduction to Horticultural Science (2R)

**Y. S. Ho, L. Y. Chen,
F. L. Liou**

Basic principles of production, processing and utilization of fruit, vegetable, flower and ornamental crops are introduced in this course. The economic importance and distribution of horticultural enterprises, roles of horticulture in world nutrition and food supply, improvement of environmental quality in the landscape, aesthetic values, and medicinal uses are also covered.

112002 作物學 (2 必)

古明萱

本課程主要在使學生對農藝作物之生長發育與環境因子之關係及對栽培管理技術有一整體性之瞭解。內容包括介紹農藝作物之分類、生理、生長與環境之關係，以及栽培與管理技術，包括繁殖、施肥、灌溉、病蟲害及採收貯藏等。

112002 Science of Field Crops (2R)

M. S. Guu

The major objectives of this course are to introduce the growth and development of different agronomic crops and their relationships with different environmental factors. Also, the cultural system for each crop including propagation, fertilizing, irrigation, pest management and postharvest techniques etc, will be introduced.

112030 作物病蟲害管理與診斷技術 (3 必)

鄭光哲、華真

課程目的在讓學生瞭解各種作物病原及害蟲之診斷及管理技術，其內容包括作物病蟲害種類特性、

病原、害蟲為害症狀、致病機制以及管理方法，並以數種具有代表性的病蟲害，討論病原及害蟲特性、致病與為害過程、管理方法選擇、使用及效果評估等。

**112030 Management and Identification (3 R)
Techniques of Plant Diseases
and Insect Pests on Crop Plant**

K. C. Cheng. 、T. Hua.

The purpose of the course is to offer knowledge on techniques of plant disease and insect pests management and identification. The topics cover different kinds of plant diseases and insect pests, pathogen, symptoms, mechanism of pathogenesis and injury of insect pests. Representative plant diseases and insect pests are used as examples to explain the above topics.

112031 作物病蟲害管理與診斷技術實習 (1 必)

鄭光哲、華 真

主要配合正課安排實習內容，期能以實際操作了解病原菌與害蟲的為害及診斷與管理技術的效果。內容包括室內的基本操作、病蟲害辨識、網室內的接種及防治實驗，以及田間的作物病害蟲診斷與管理方法等。

**112031 Management and Identification (1 R)
Techniques of Plant Diseases
and Insect Pests on Crop Plant Lab.**

K. C. Cheng. 、T. Hua.

The purpose is to cope with the lecture course, to learn the practice and techniques of management and identification on plant pathogen and insects pests The topics include basic operation, identification and control techniques of plant diseases and insect pests on crop. realize current status of agricultural industry.

112039 農業機械 (2 選)

洪辰雄

本課程內容是使學生瞭解各種農業機械的特性及用途，內容包括農業動力與作業機二部份，農業動力主要介紹發動機、耕耘機，曳引機及電力馬達。作業機則介紹整地播種、灌溉、病蟲害防治、施肥、收穫等機具及農產品處理加工機具，另外其他工程機械在農業上應用的介紹。

**112039 Agricultural Machinery (2 E)
Operation**

C. H. Hung

This course is for students to understand the character and use of all kinds of Farm-machinery. This Farm-machinery course includes two parts: Farm-power and their implements. Farm power introduces engine, power tiller, tractors and electric motor; The implements introduce tillage planting, irrigation, insect and disease protection, fertilizer and harvesting equipment and agricultural products processing equipment, as well as other machines used in farm-land.

112040 農業機械實習 (1 選)

洪辰雄

本實習是讓學生實際瞭解各種農業機械的構造與功能，並學習農機的操作與維護保養。內容包括引擎耕耘機，曳引機，馬達及整地、播種、灌溉、病蟲害防治，施肥、收穫等，農產品處理加工機械及工程機械在農場上的利用。

**112040 Practice of Agricultural (1 E)
Machinery Operation**

C. H. Hung

This practice is for student to understand the structure and performance of all kinds of farm-machinery. and learn to operate and maintain ,including engine, power-tiller, tractor, electric motor and tillage, planting irrigation, plant protection, fertilization and harvesting of produces and other machines used in farm.

(2)選修科目 Selective Courses

112028 糧食作物學 (2 必)

蔡秀隆

使學生瞭解食用作物之意義、種類、起源、分佈、產銷供需情形、生理、生態、生育之環境、栽培之方法、輪作制度、收穫調製、儲藏及利用之方法，結論中包括食用作物增產方法與國計民生、社會治安、國家前途及世界和平之關係。

112028 Food Crop (2R)

S. L. Tsai

The meaning, kind, origin, distribution, production and marketing, supplying and demanding, characteristics of crop physiology and ecology, growth environment, cultivated method, rotation farming system, method of harvest and manufacture, storage and utilization of edible crops are introduced in this course. The techniques of increasing crops production, the relationship among people life, social security, country future and world peace are discussed in conclusion.

112029 糧食作物學實習 (1 必)

蔡秀隆

實際田間主要種類之糧食作物生產操作，使學生了解其植株生長特性，栽培方式及收穫，調製等技術，並於室內辨認不同作物之種子特性，植株各部位特性及生理、生態結構。

112029 Practice of Food Crop (1R)

S. L. Tsai

All students will attend the field practice of major food crops to understand the plant growth characters, culture methods, management and harvest techniques. In the laboratory: seed characteristics, plant characters, physiological and ecological structures will also be studied. affecting losses of horticultural products, Various postharvest handling techniques and storage methods to reduce postharvest losses are also introduced.

112010 蔬菜學 (2 必)

金石文、劉福隆

本課程之目的，在使學生獲得有關蔬菜栽培及生產之基本原理與技術等知識，講授內容包括：蔬菜園藝之性質及利益、蔬菜之效用、蔬菜之種類及分類、蔬菜生產之類型、氣候及土壤與蔬菜生產之關係、蔬菜之育苗及塑膠布之應用、肥料及水分之管理、蔬菜生產之栽培管理、蔬菜採收及收穫後處理、蔬菜病蟲害防治、蔬菜品種與生產、蔬菜各論，就目前台灣所栽培之重要蔬菜種類加以闡述。

112010 Olericulture (2R)

S. W. Chin, F. L. Liou

The goals of this course are to acquaint students with knowledge of basic principles and techniques of vegetable production. The topics include: Introduction of properties and benefits of vegetable production, Food value of vegetables, Classification of vegetables, Types of vegetables production, The relationship between soil and weather condition of vegetables production, Vegetables seedling growing and the application of mulching with PE, Fertilizers and irrigation, Cultivation management, Control of disease and insects, Varieties of vegetables and Introduction of the individual vegetable crops in Taiwan.

112011 蔬菜學實習 (1 必)

金石文、劉福隆

使學生實際練習蔬菜之栽培及管理技術，包括蔬菜種類及種子之認識，整地、播種、灌溉、施肥、中耕除草、病蟲害防治、育苗、採收等生產技術之練習。期能使每一位學生栽培不同蔬菜，互相觀摩學習並提出栽培心得。

112011 Practice of Olericulture (1R)

S. W. Chin, F. L. Liou

The objective of this course is to acquaint students practice the methods and technique of vegetable crop production, including identification of vegetables varieties and seeds, soil preparation, nursery, fertilizing, irrigation, cultivation, weed and pest control and harvest etc. Through discussion and practice of individual vegetables crop, let students understanding of both practical operation as well as theoretical aspects of the lecture subjects.

112053 設施園藝 (2 選)

何韻詩

本課程主要介紹園藝設施種類、構造規劃和材料選擇。此外討論設施內光線、溫度、溼度、空氣等

微氣候之特性、管理控制方法和作物的反應。並以水耕栽培為例、深入介紹無土栽培的運用和施肥、灌溉技術。另外簡介溫室病蟲害防治的使用、穴盤育苗等及相關的機械化設備。

112053 Horticultural Production (2E) under Structures

Y. S. Ho

This course is designed for students planning careers in commercial horticultural production under structures. The contents include types of structures and materials; microclimate in the greenhouse and its management; techniques of watering, fertilization; media and growth regulator handling; disease and pest control. Hydroponics, plug system and related appliances are also briefly introduced.

112054 設施園藝實習 (1 選)

何韻詩

實習以循環式水耕栽培為主要項目，同時練習養液配製、設施內環境變化觀察及管理，並做合理的病蟲害防治。另外練習孵豆芽；實際觀測各種設施架構、栽培方式和灌溉系統，了解其特色、優缺點和價格。

112054 Practice of Horticultural (2E) Production under Structures

Y. S. Ho

Circulated hydroponic production is the major topic of this course, which includes nutrient solution composing, environmental management and pests control. Projects also content bean sprout production, greenhouse structure and irrigation system measuring, and evaluating, as well as price estimation of irrigation systems.

112014 果樹學 (2 必)

顏昌瑞、傅炳山

本課程提供基本果樹生產管理技術，內容包括果樹栽培之環境要素、植株栽培及生理特性，開花結果習性，繁殖方法，育種，果樹栽培管理方法及各種果樹生產模式，並論及台灣果樹產業現況及變遷與未來之發展。

112014 Pomology (2R)

C. R. Yen, B. S. Fuh

The course provides fundamental technology of fruit production and orchard management. Environmental factors, botanical and physiological characteristic, flowering, pollination and fruit bearing habits, propagation, breeding, orchard management and production of important fruit crops are covered.

112015 果樹學實習 (1 必)

顏昌瑞、傅炳山

本實習課程提供果樹學田間實地操作之訓練，包括：果樹之建立與管理、土壤肥料管理、果樹整枝修剪、果苗繁殖及果樹分級、包裝、採收後處理技術，使學生在實習中了解果樹栽培之各種程序。

112015 Practice of Pomology (1R)

C. R. Yen, B. S. Fuh

The course is designed for training of field practices of fruit crops. Emphasis will be placed on 1.establishment and management of orchard, 2.soil and soil fertility management, 3.pruning and training of fruit trees, 4.propagation and nursery practices, 5. grading, packing, and postharvest technology.

112008 花卉學 (2 必)

何韻詩、陳麗筠

本課程旨在介紹與花卉生產相關的科技、產業和應用範圍。內容包括定義，相關學科，分類，產業概況，花卉應用，植物生長發育及開花生理：營養生長與生殖生長的轉變機制、環境因子的影響，產期調節，採收後處理和運銷。並將主要作物依其特性分為：短日植物、日中性植物、球根植物、觀葉植物、花壇植物，簡介其商業化生產方式。

112008 Floriculture (2R)

Y. S. Ho, L. Y. Chen

The objective of this course is to introduce floriculture related sciences, technologies, and businesses. Included topics are: definition, classification, and scopes of floriculture; floral utilization; flowering

physiology and induction; postharvest management; introduction to commercial production of major short-day plants, day-neutral plants, bulbs, foliage plants and bedding plants.

112009 花卉學實習 (1 必)

何韻詩、陳麗筠

本課程以實際操作訓練不同階段及型態的花卉之栽培管理基礎技術。實習單元共有：穴盤育苗、田間及盆栽作物的栽培管理、草花辨認、花卉的利用設計及英文論文研讀。

112009 Practice of Floirculture (1 R)

Y. S. Ho, L. Y. Chen

This course offers bands on practices of techniques about flower culture and management in different production stages and systems. Topics of activities are: plug production, outdoor plants and potted plants growth and management, plant identification, floral utilization, and literature review.

112026 遺傳學 (2 必)

陳福旗、陳幼光

本課程的目的在介紹遺傳的基本原理及其應用。主要內容包含孟德爾遺傳定律、有絲分裂和減數分裂、基因的連鎖和遺傳定位、DNA 的構造及複製、突變的機制及 DNA 修補、基因的表達、和族群遺傳等。

112026 Genetics (2R)

F. C. Chen, Y. K. Chen,

This course is aimed at introducing the basic principles and applications of Genetics. The main content includes Mendelian genetics, mitosis and meiosis, gene linkage and genetic mapping, the structure and replication of DNA, mechanisms of mutation and DNA repair, gene expression, and population genetics.

112027 遺傳學實習(1 必)

陳福旗、陳幼光

本實習課程的目的在訓練學生關於遺傳基本的原理與實驗操作技術。主要內容包含性狀的遺傳、染色體結構和計數、有絲分裂與減數分裂、統計方法、細菌遺傳、質體抽取、限制酶切割及電泳分析、血型分析和人類遺傳等。

112027 Practice of Genetics (1R)

F. C. Chen, Y. K. Chen,

The purpose of this laboratory is to train undergraduate students with the basic principles and practices used in genetics, including trait inheritance, chromosome structure and counting, meiosis, statistical methods, bacterial genetics, plasmid isolation, restriction enzyme digestion and gel electrophoresis, blood typing, and human genetics.

112020 特用作物學(2 必)

賴宏亮、林素汝

本課程目的在培養嗜好作物之生產、改良人才。主要內容在敘述特用作物之意義、範圍及研究方法。選擇特用作物中之一類-嗜好作物如茶、菸、可可和咖啡等說明其栽培改良方法。

112020 Special Crops Science (2R)

H. L. Lay, S. J. Lin

The objective of this course is to give students more confidence in their ability for producing and improving the recreation crops. The main contents of this course will describe the definition, sort, and study method of special crops. We will describe the cultivation and improvement of the recreation crops, such as tea and tobacco plant etc.

112021 特用作物學實習 (1 必)

賴宏亮、林素汝

本課程共包括：菸草、茶及咖啡等嗜好類作物之植株性狀，苗床之準備，播種，苗床管理，定植，田間管理，施肥，病蟲害防治，採收，調製方法，貯藏，產品品評及成分的分析等。

112021 Practice of Special Crops Science (1R)

H. L. Lay, S. J. Lin

The course includes tobacco, tea and coffee on their plant characteristics, seedbed preparation, sowing, seedbed treatment, transplanting, field management, fertilization, control of disease and pest, harvesting, preparation method, storage, tasting of products, and component analysis.

112042 農業氣象學 (2 選)

唐 琦

本課程先介紹各種氣象要素（如日射、日照、溫度、氣壓、風、雲、霧、降水、蒸發等）應用於農業生產環境之測定方法介紹，其次對於大氣主環流、次環流（季風、氣團、鋒、氣旋）、局部環流（海風、陸風、山風、谷風）、劇烈天氣、颱風、農業氣象災害、農地微氣候形成過程逐章闡述，並由天氣變化觀察，進而使習者將相關氣象學相關知識融入農業耕作及環境關懷。

112042 Agricultural Meteorology (2E)

C. Tang

This course will introduce the meteorological elements such as solar radiation, sunshine duration, temperature, humidity, air pressure, wind, cloud, fog, precipitation and evaporation in the initial stage. Then the main circulation of the atmosphere, secondary circulation (monsoon, air masses, front, cyclone), local circulation (sea breeze, land breeze, uphill breeze, downhill breeze), violent weather, typhoon, agricultural meteorological disaster, process of microclimate formation on farmland, will be explain chapter by chapter. By means of weather observation is helpful for the learners to apply the knowledge of meteorology in agricultural cultivation and then will be concerned the environment.

112016 土壤與肥料 (2 必)

王鐘和

本課程的目的，在使學生認識土壤與肥料，並瞭解它們在地球上所扮演的角色。土壤部份的課程內容有認識土壤、土壤的生成與分類、土壤的物理與化學、土壤有機質與生物、土壤水份、土壤與植物及土壤管理。肥料部份的課程內容有認識肥料、肥料元素、有機質肥料與化學肥料、肥料需要量的決定及肥料施用法。

112016 Soil and Fertilizer (2R)

C. H. Wang

The purpose of this course is to know soil and fertilizer and to understand their roles on earth. The contents of the soil part include knowing soils, genesis and classification of soils, soil physics and chemistry, organic matters and soil biology, water in soils, plants and soils and soil management. The contents of the fertilizer part include knowing fertilizers, fertilizer elements, organic and inorganic fertilizers, decision making for fertilizer requirement and fertilizer application methods.

112048 有機農業概論 (3 選)

王鐘和

本課程主要介紹有機農業的理念，國內外有機農業的發展及其重要性，以及達成有機農業經營的管理策略。

112048 General Discussion of Organic Farming (3 E)

C. H. Wang

The course is mainly to recognize organic farming, introducing its importance and development in different countries, and the management strategy of organic farming.

112022 農園產品處理學 (2 必)

柯立祥

本課程主要在介紹果園產品收穫後之生理變化及處理與貯運技術，包括選別、分級、包裝、預冷、貯藏及運輸等等。

112022 Postharvest Technology (2R) of Agricultural Products

S. L. Ke

This course is to offer knowledge on postharvest physiological changes and factors affecting losses of horticultural products. Various postharvest handling techniques and storage methods to reduce postharvest losses are also introduced.

112023 農園產品處理學實習 (1 必)

柯立祥

本實習主要在使學生熟悉農園產品採收後處理之有關技術，內容包括包裝、果品處理、貯藏、品質分析、呼吸率及乙烯發生率測定...等等，使學生能將理論與實習實際結合。

112023 Practice of Postharvest Technology of Agricultural Products (1R) S. L. Ke

This course is to make students practice the various postharvest handling and storage techniques, including packaging, handling, storage, quality analysis, and determination of respiration rate and ethylene production, among others to let students understand both practical operation as well as theoretical aspects of the lecture subjects.

112003 植物繁殖技術 (2 必)

傅炳山、陳幼光、劉福隆、金石文

本課程旨在介紹植物繁殖的原理和技術。主要的內容涵蓋植物繁殖的生物學、繁殖的環境、種子繁殖的方法，包括種子的發育、生產和處理技術，以及無性繁殖方法，包括扦插、嫁接、壓條和特化莖或根的繁殖等。

112003 Plant Propagation Techniques (2R)

**B. S. Fuh, Y. K. Chen,
F. L. Liou, S. W. Chin**

The objective of this course is to introduce the principles and techniques of plant propagation. The main content will cover the biology of plant propagation, propagation environment, seed propagation including seed development, seed production and handling techniques and vegetative propagation methodology, which includes cuttings, grafting, layering and propagation by specialized stems and roots.

112004 植物繁殖技術實習(1 必)

**傅炳山、陳幼光
劉福隆、金石文**

此乃配合植物繁殖技術講授課程之一應用的繁殖課程。學生將可從實際的操作過程中來學習到如何利用種子繁殖的方法、種子發芽率的測試、扦插、嫁接、壓條、特化莖和根以及其他的繁殖方法。

112004 Practice of Plant Propagation Techniques (1R) Chen, Chin

**B. S. Fuh, Y. K.
F. L. Liou, S. W.**

This is an applied propagation course, which accompanies the Plant Propagation lecture. This is a hands-on course, where the students will learn and practice propagation techniques such as propagation from seeds, seed germination tests, cuttings, grafting, layering, specialized stems and propagation through as well as other propagation methods.

(三) 水產養殖系 Department of Aquaculture

(1)必修科目 Required Courses

132004 水產養殖學(2 必)

鄭文騰

本課程為介紹世界水產養殖現況及台灣養殖現況，後再討論有關養殖水質處理、養殖系統、養殖設備及依生物學的觀點，介紹各種具有經濟價值之水產生物之養殖技術。

132004 Introduction to Aquaculture(2R)

W. Cheng

The theme of the course provides the students the current knowledge of aquacultural techniques, survey of the fields, water qualities and treatments, culture systems, culture facilities, and biology and culture techniques of the commercially aquatic organism .

132013 水產繁殖學(2 必)

陳英男

本課程乃介紹主要經濟水產養殖動物之種魚選擇、培育、催熟與產卵、孵化並探討種苗的培育技術。有關魚蝦類生殖生理，脂肪酸的構成與繁殖之相關性一併列入討論。

132013 Fish Breeding & Propagation (2R)

Y. N. Chen

This course instructs the selection, culture, hormonal injection techniques and ovulation of economically aquatic organism maturation and hatch of fertilized eggs and culture larvae (or fry) techniques. Physiological responses and fatty acid composition in fish and shrimp was also discussed.

132040 水產飼料學(2 必)

邱謝聰

本課程乃探討魚類完全配合飼料製造之現代加工技術，內容包括：1.單味飼料之生產方式與一般生產過程之影響因素。2.配合飼料之製造包括設計、粉碎、混合、製粒，油脂添加之有關技術。3.養魚飼料之製造技術等。

132040 Fish Feed Formulation and Processing Techniques (2R) S. T. Chiu

The objective of this course is to give the students the modern technique about the formula feed industry of the fish and shrimps which contains:(1).The processing of the ingredient feed and the influential factors about general processing problems.(2)The engineering of formula feed, including design, milling, grinding, mixing, pelleting and the technique of addition oil.(3)The technique of manufacturing of the fish formula feeds.

(2)選修科目 Elective Courses

132005 水質學(2 選)

吳宗孟

本課程介紹下列水質分析技術:pH、透明度、導電度、鹽度和氯度、鹼度及酸度、二氧化碳、硬度及鈣和鎂、溶氧量、氨—氮、亞硝酸—氮、硝酸—氮、硫及其化合物、磷及磷酸鹽和矽酸、化學氧需求量和生物化學氧需求。

1320056 Analysis of Water Quality(2S)

Z. M. Wu

This course introduces the technology of analysis of water quality as followed: pH, transparency, conductivity, salinity and chlorinity, alkalinity and acidity, carbon dioxide, hardness and calcium, magnesium dissolved oxygen, ammonia—nitrogen, nitrite—nitrogen, nitrate—nitrogen, sulfur and its compound, phosphorus and phosphate, chemical oxygen demand biological oxygen demand.

132006 水質學實習(1 選)

吳宗孟

本實習安排學生實際操作下列水質分析技術:pH、透明度、導電度、鹽度和氯度、鹼度及酸度、二氧化碳、硬度及鈣和鎂、溶氧量、氨—氮、亞硝酸—氮、硝酸—氮、硫及其化合物、磷及磷酸鹽和矽酸、化學氧需求量和生物化學氧需求。

132007 Water Quality Analysis in Aquaculture Lab. (1S) Z. M. Wu

This practice includes the technology of analysis of water quality as followed: PH, transparency, conductivity, salinity and chlorinity, alkalinity and acidity, carbon dioxide, hardness and calcium, magnesium, dissolved oxygen, ammonia—nitrogen, nitrite—nitrogen, nitrate—nitrogen, sulfur and its compound, phosphorus and phosphate, chemical oxygen demand biological oxygen demand.

132016 水產養殖學實習(1 選)

課程將教導學生實際養殖場中各種養殖器具之操作、養殖場水質之管理、操作措施。各種魚、蝦、貝類之養殖及遇到緊急狀況(如:浮頭、泛池等)之應變措施。

132016 Practice of Aquafarm(1S)

In this class, students will be asked to operate all practical equipment, water quality determination and all operational procedures in aqua farm and taught how to manage the aqua farm such as low dissolved oxygen in order to succeed in aquaculture.

132011 餌料生物學(2 選)

劉俊宏

本課程係專門規劃提供學生水產餌料生物之知識，同時增進學生瞭解餌料生物之形態、生態、培養

及於水產養殖上之利用技術，其主要內容包括植物性浮游生物之微藻、動物性浮游生物之輪蟲、水蚤、橈角類、豐年蝦、牡蠣受精卵，至較大型之紅蟲等。

132011Cultivation of Living Organisms(2S)

C. H. Liu

The course is especially designed to provide students with the modern knowledge of aquatic live-foods in one semester lecture and the same time that enhances their under-standing of live-foods on morphology, ecology and cultivation, and application techniques in aquaculture. The main topics including microalgae, rotifera, copepods, brine shrimp, oyster fertilized eggs, blood worm etc.

132012 餌料生物學實習(1 選)

劉俊宏

本實習課程提供一個實務的機會，讓學生能瞭解各種餌料生物之形態及習性特徵，進而訓練學生實務操作培養餌料生物，其中包括其主要內容包括植物性浮游生物之微藻分離及培、動物性浮游生物之輪蟲、水蚤、橈角類、豐年蝦、牡蠣受精卵，至較大型之紅蟲培養等。

132012Cultivation of Living Organisms Lab. (1S)

C. H. Liu

This Lab : provides with a real learning opportunity for students to be capable of understanding the characteristics morphology and living habits of various live-foods, and than to train them having a practical tichnique of cultivation of those live-foods which are included microalgae isolation and cultivation, and rotifera, copepods, brine shrimp, oyster fertilized eggs, blood worm cultivation etc..

132014 水產繁殖學實習(1 選)

陳英男

本課程是介紹重要養殖水產生物種的選擇與培育、催熟與產卵及孵化與種苗的培育技術。從種魚蝦的挑選、性別的辨別、物理催熟方法、化學注射方法、腦下垂體的取得與注射、單倍體多倍體的操作原理與方法。

132014Fish Breeding & Propagation Lab. (1S)

Y. N. Chen

The Lab. training requires students involved in the following subjects; actual treatment and propagation of aquaculture organism maturation, fertilized eggs and larvae culture techniques. Induce of single sex cultivation of some economical species. Besides, students have to choose one fish or shrimp species to grow and make it breed either in artificial way or natural way.

132041 水產飼料學實習(1 選)

林鈺鴻

本課程主要讓學生瞭解及練習完全配合飼料之現代加工技術，內容包括：(一)單味飼料之認識。(二)配合飼料之製造包括設計、粉碎、混合、製粒，油脂添加之有關技術。(三)魚類與蝦類飼料之製造技術。

132041Fish Feed Formulation and Processing Techniques Lab. (1 S) Y. H. Lin

This lecture contains the practice of feed processing technique about the formula feed of fish and shrimps which contains:(1)The knowledge of the ingredient of feed.(2)The engineering of formula feed, including design, milling, grinding, mixing, pelleting and the technique of addition oil.(3)The technique of manufacturing of the fish or shrimps formula feeds.

132018 魚病學(2 選)

張欽泉

本課程講解比較魚類及其它動物之主要生理解剖構造之不同，以了解魚病發生之過程，介紹各種魚病之病因、診斷、疫學預防及控制。及講解與公共衛生有關之魚類疾病。

132018Fish Diseases(2 S)

C. C. Chang

This Course emphasizes on major differences in fish and animal structure and histology, physiological features for undertanding of fish disease development, Etiology, diagnosis, epizootiology, prevention and control of disease in fish, including those important to the public health.

132018 魚病學實習 (1 選)

張欽泉

本課程講解及實際操作各種魚類病原(包括細菌、病毒、黴菌及寄生蟲等)之分離、鑑定及診斷技術。本課程亦包括魚類疾病之預防與治療及魚類免疫學診斷技術之應用。

132018 Practice of Fish Diseases (1S)

C. C. Chang

Instruction and practice of isolation, identification techniques for various types of fish pathogens, such as bacteria, virus, fungi and parasite etc. will be included in this course. The contents of this course also include immunology practices, prevention and treatment method for fish diseases.

132061 觀賞魚養殖與管理(2 選)

吳宗孟

本課程介紹目前台灣觀賞魚的養殖和繁殖、水族造景和水草之管理、水族器材、水族箱之水質處理與管理和水族箱之養殖管理。

132061 Culture and Management of Ornamental Fish (2S) Z. M. Wu

The course is comprised of the artificial propagation and management of aquarium fish cultured in Taiwan、aquarium design and management of aquarium plant、Aquarium apparatus、the process and control of water quality in aquarium and the management of aquarium .

132062 觀賞魚養殖與管理實習(1 選)

吳宗孟

本實習介紹目前台灣觀賞魚的養殖和繁殖、水族造景和水草之管理、水族器材、水族箱之水質處理與管理和水族箱之養殖管理。

132062 Practice of Culture and Management of Ornamental Fish. (1S) Z. M. Wu

The course is comprised of the artificial propagation and management of aquarium fish cultured in Taiwan, aquarium design and management of aquarium plant, Aquarium apparatus, the process and control of water quality in aquarium and the management of aquarium .

(四)食品科學系 Department of Food Science

(1)必修科目 Required Courses

362001 食品加工(1) (2 必)

蔡碧仁、蔡錦燕 下

本課程包含畜水產加工及蛋乳製品加工。包括原料種類、生化特性、鮮藏與保存，及各類加工技術。並介紹加工過程中之理化變化及產品保存與品質測定。

362001 Food Processing (2R)

P. J. Tsai, C. Y. Tsai, S

The course emphasizes on the processing of meat seafood, milk and egg. Biochemical properties of the raw material, its extended shelf life, preservation and quality check in products during processing are included

362002 食品加工實習(1) (1 必)

蔡碧仁、蔡錦燕，下

本課程配合正課的內容，包括肉品生產過程及品管作業包裝，煉製品之罐頭、魚丸、魚蝦醬油及其他加工品之製造及開發。

362002 Food Processing Lab.(1)(1R)

P. J. Tsai, C. Y. Tsai, S

The lab provides the chance to practice the processing of dried pork bundle, sausage, cured meat, fish ball, dehydrated fish stick and shrimp sauce products.

362003 微生物學 (3 必)

謝寶全，下

本課程的內容包括：微生物學在科學上之地位、發展歷史、未來展望。微生物之形態及分類。微生物之細胞構造及功能、微生物之遺傳及微生物之控制。

362003 General Microbiology (3R)

P. C. Hsieh, S

This course includes introduction of microbiology, history and development, morphology and identification of microorganisms, cell structure and function of microorganisms, microbial genetics and control of microorganisms.

362004 微生物學實驗 (1 必)

邱秋霞，下

本課程之內容包括：

顯微鏡之使用、培養基之配製及滅菌方法、微生物之培養分離及純化、各種不同之染色法、微生物生理及生化特性探討及微生物生長條件之探討。

362004 General Microbiology Lab (1R)

C. H. Chiu, S

The lab course covers how to use microscope, preparation of media and methods of sterilization, culture transfer techniques, microscopic examination of stained cell preparations, microscopic examination of living bacterial preparations, the microscopic measurement of microorganisms, Gram stain, serial dilution-agar plate procedure to quantitative viable cell, the bacterial growth curve, biochemical and physiological characteristics of microbes, cultivation and morphology of molds and yeast.

362005 食品衛生與安全 (3 必)

郭嘉信，上

講授食品從生產原料，經加工過程、包裝，直到人類攝食為止之各階段過程中，確保人類食生活上之衛生與安全的問題；食品與微生物、食品之腐敗、食物中毒、食品添加物，經口傳染病、人畜共通傳染病、食品與寄生蟲、食品之放射線能污染、食品衛生上之對策以及食品法規等。

362005 Food Hygiene and Safety (3R)

J. H. Guo, F

Food hygiene and safety is to teach the means necessary for ensuring the hygiene and safety of human being, the food at all stages from its growth, products or processing, packaging, until its final consumption. It contains food and microorganisms, food deterioration, food poisoning, food additives, oral infection, zoonosis, food and parasite, food and sanitary insects, contamination of radiation substance, the measurement of food hygiene and the laws and regulations of food.

(2)選修科目 Elective Courses

362006 食品行銷 (2 選)

吳明昌 上

本科目為了使學生清楚地瞭解食品行銷的基本概念和原則，進而促使學生熟悉食品交易行為，以培養出具行銷能力之食品科技人員。教學內容包括理論與實物研討兩部分。(一)在食品行銷理論方面將蓋下列範圍：行銷管理程序、策略性規劃、行銷研究、行銷資訊系統、行銷通路、產品促銷、競爭性行銷策略、國際行銷 (二)在實務研討方面：以不同食品企業之行銷方式做為研討對象，教學方式兼採講授，分組討論，專案報告與測驗。

362006 Food Marketing (2S)

M. C. Wu, F

The objective of this course was designed to teach food marketing basic concepts and principles. So that student could also specialize in marketing as well as food science and technology. The courses included: (A) marketing management procedure, strategic planning, marketing research, marketing information system, distribution channels, product promotion, competitive marketing strategy, international marketing (B) Individual food enterprise marketing.

362007 醱酵學 (2 選)

謝寶全、邱秋霞，上

講授以應用微生物的醱酵技術製造各種發酵產品之生產技術，如酒類工業、有機酸工業、發酵食品工業、胺基酸工業、酵素工業、菌體生產工業、抗生物質工業、核酸關連物質工業、微生物轉換醱酵工業、生理活性物質生產工業等，以及利用微生物之醱酵技術於培養植物細胞生產有用物質與

生產細胞的方法。

362007 Fermentation (2S)

P. C. Hsieh, C. H. Chiu, F

The course based on the knowledge of applied microbiology to discuss the related fermentation industry: brewing, organic acids, food fermentation, amino acids, enzymes, antibiotic, etc. The course also covered the technique of cell production.

362008 醱酵學實驗 (1 選)

邱秋霞，上

使學生練習生產單細胞蛋白質之培養技術、酒精醱酵技術、有機酸醱酵技術、胺基酸醱酵技術、酵素生產醱酵技術、抗生物質生產技術、醱酵食品製造之技術以及培養植物細胞生產有用物質與大量生產有用細胞之培養技術等。

362008 Fermentation Lab (1S)

C. H. Chiu, F

The lab covers the single cell protein, technique in alcohol fermentation、amino acids、enzymes、antibiotics production and food fermentation, and the cell production technique.

362009 食品生鮮處理技術 (2 選)

蔡碧仁，下

本課程在探討生鮮食品市場之食品處理技術，其內容包括新鮮魚肉之性質、品質保持處理包裝及衛生安全；蔬果採收後之熟成老化、呼吸率之控制，寒害及腐敗之避免；以及生鮮食品進入市場前之處理、包裝、冷處理等鮮度保持法。

362009 Post-harvest Technology (2S)

P. J. Tsai, S

The course is designed to discuss the skill of treatment needed in the fresh food supply market including appropriate postharvest treatments, packaging and cold storage prior to the market. The subjects include the postharvest physiology of fruits and vegetables, control of respiration, chilling injury and decay through temperature, humidity, gas atmosphere storage, irradiation and edible film technology. The characteristics of fresh meat, seafood and milk are also covered besides quality maintenance, package and sanitation.

362010 食品生鮮處理技術實習 (1 選)

蔡碧仁，下

本課程配合食品生鮮處理之課程來操作試驗，使學生能深入瞭解處理技術。其內容包括蔬果採收後之處理方法，如保鮮環境（溫度、濕度、氣體組成等）之條件；魚肉類鮮度判斷，影響熟成、自體分解、腐敗速率之因素試驗；生鮮材料之清淨、處理、調理包裝及貯存等實習。

362010 Post-harvest Technology Lab (1S)

P. J. Tsai, S

The course is designed to match the lecture of “Postharvest Technology” and make students understand the typical technique required in cleaning, package, storage and quality analysis. The skills included the postharvest treatment of fruits and vegetable (proper handling such as storage temperature, humidity, gas environment and edible film) and quality analysis; practices on the test of the freshness of meat, fish and milk. Factors influencing self-decomposition and decay of fish and meat etc. are also covered.

(五)農企業管理系 Department of Agribusiness Management

(1)必修科目 Required Courses

502004 農企業管理 (3 必)

林永順 下

本課程乃系統性地介紹一個農企業經理人應具備之技能，包括：(1)農企業管理學內涵(2)農企業經營規劃與決策(3)消息收集與分析(4)預測方法(5)農企業產品與生產規劃(6)農企業資金與預算(7)農企業成本與收益觀念(8)不同評價之成本項目與效益分析(9)農企業行銷(10)農業政策與環保問題(11)農企業組織(12)人力資源(13)農企業控制原則(14)農企業經營目標之設計。

502004 Agribusiness Management (3R)

Y.S. Lin, S

The course gives a systematic knowledge for agribusiness manager includes as follows:(1)The contents of Agribusiness; (2)Planning and Decision; (3)Information collection and Analysis; (4)Forecasting; (5)Products and Production planning; (6)Capital and Budget; (7)Cost and Revenue; (8)Cost evaluation and Benefit analysis; (9)Agribusiness marketing; (10)Agricultural policy and Ecosystem protection; (11)Agribusiness Organization; (12)Manpower Resources; (13)Controlling; (14)Management Indicators.

506009 休閒農業 (3 必)

段兆麟 下

本課程旨在使學習者了解休閒農業之意義與發展背景，理論與類型，規劃設計的原理與方法，經營管理的策略與實務，解說服務的功能和技巧，教宣導的原則和方法，有關法令和規定，以及診斷評估的技術和方法，以增進學習者對休閒農業之知識及經營管理之能力。課程架構如下：休閒農業理論、休閒農業之範圍與計畫、休閒農業相關法規與計畫、休閒農業之規劃與設計、休閒農業之經營策略、休閒農業經營管理、休閒農業之解說服務、休閒農業之教育宣導、休閒農業與農村文化發展、休閒農業之經營診斷與評估。

506009 Leisure Agriculture (3R)

C.L. Tuan, S

This course provides a comprehensive introduction to the management of leisure agriculture. The structure of this course is as following: theory of leisure agriculture ; Scope and pattern of leisure agriculture ; Law and plan concerns with leisure agriculture ; Planning and design of leisure agriculture ; Strategy of leisure agriculture ; Operation of leisure aquiculture ; Explanation of leisure agriculture ; Promotion of leisure agriculture ; Village folk and leisure agriculture ; Diagnosis and appraisal to leisure agriculture

506010 農產行銷 (3 必)

陳淑恩 下

本課程旨在使學生了解農產行銷之理論與運作，以為農企業管理者因應行銷環境有效地行銷管理。內容包括：(1)農產行銷基本概念、(2)農產品供需與價格理論、(3)農產品市場與農產行銷企業、(4)農產品價格、(5)農產行銷績效、(6)農產行銷政策制度與法規。

506010 Marketing of Agricultural (3R) Products

S.E.Chen, S

This course gives students the knowledge of marketing of agricultural products. It includes: (1) the concept and operations of marketing of agricultural products, (2) theory of demand, supply, and price of agricultural products, (3) markets and marketing agribusiness, (4) prices of agricultural products, (6) marketing performance of agricultural products, and (6) policy and regulations of agricultural product marketing.

502023 農業生物科技產業概論 (3 選)

蔡青園 下

課程目標：1.生物科技產業在國內外發展之現況 2.各種產業特性 3.關鍵技術之專利 4.生技產品開發及投資所面臨的問題。課程內容：1.生物技術概論 2.生物技術在產業之發展與應用 3.先進國家及我國生技產業在技術研發之現況及展望 4.生技產業的商業行為 5.生技產品開發及市場需求。

502023 Introduction to Agricultural (3 E) Biotechnology industry

C.Y. Tsai, S

Course objectives : 1.To discuss the development of Bioindustry in Taiwan and advanced countries in the world; 2.The characteristics of Bioindustry in differents kind of domain; 3.The special technology in Bioindustry for patent; 4.The problems of exploitation in Bioindustry product and investment for Biotechnology. Course contents : 1.Outline of this Bioindustry; 2.The development and application of biotechnology in Bioindustry; 3.The current situation and perspective of Biotechnology industry

exploitation in Taiwan and advanced countries in the world; 4.Business behavior in Bioindustry; 5.Market demand and development of Bioindustry products.

506007 臺灣農業發展與政策 (3 選)

黃文琪 上

本課程旨在探討台灣農業發展及因應不同發展階段之農業政策，以為農企業經營環境之分析。本課程包括：概論、經濟發展理論、政策理論、台灣農業發展階段、農地政策之轉變、農業結構之轉變、農業人口之轉變、台灣農業政策之內涵、農業政策在農業發展中的角色、農業發展和政策與農企業經營之關係、農業發展與政策之分析

506007 Taiwan Agricultural Development and Policy (3E)

W.C. Huang, F

The objective of this course is to discuss agricultural development in Taiwan and the agricultural policies corresponding to different stages of agricultural developments and to analyze agricultural development and policy as parts of agribusiness environments. The contents of this course are: Introduction ; Economic development theory ; Policy theory ; Agricultural development stages in Taiwan ; Changes of agricultural land policy ; Changes of agricultural structure ; Changes of agricultural population ; Implication of agricultural policy in Taiwan ; Roles of agricultural policy in agricultural development ; Relationships of agricultural development, policy, and agribusiness management ; The analysis of agricultural development and policy.

502021 農業概論 (3 選)

蔡青園 上

本課程目的在能使學生瞭解農業之意義及重要性，明瞭農業與自然環境之關係，熟悉農、林、漁、牧之管理技術，學習農民組織及農業推廣知識，掌握最新農業政策及未來發展趨勢。課程內容包括：1.農業環境及作物生長條件 2.農業相關產業介紹 3.農用資材產業簡介及 4.農場經營與農業政策。

502021 Introduction to agriculture (3 E)

C.Y. Tsai, F

The purpose of the course is not only to allow students to realize the use of economic methods in production/service of agribusiness products, but also to understand its significance to agriculture. When the relationship between an agricultural and natural environment is defined, better management practices can be done. This will foster better cooperation between farming organizations thus prompting agricultural promotion. These promotions will in turn address current policies necessary for future development. The course contents: 1. Agriculture environment and crop growth conditions; 2.The introduction to agricultural industries; 3. The introduction of agriculture material industry; 4. Farm administration and agriculture policies.

(2)選修科目 Elective Courses

502014 農企業管理資訊系統 (3 必)

張文宜 上

農企業管理資訊系統是使農企業能以有系統的方式，有效收集相關資料，以提供管理決策的依據。本課程從農企業資源規劃的觀點介紹其管理資訊系統的系統架構、基本功能、系統的建立，以及決策資訊的提供。課程內容包含：(1)緒論(2)資訊系統的組織架構(3)資訊系統之建立(4)現代農企業管理資訊系統。

502014 Agribusiness Management Information Systems (3R)

W.I. Chang, F

The purpose of agribusiness management information systems is to systematically and effectively collects relevant information for agribusiness management decision-making. From the integrated enterprise information planning perspective, this course introduces the architecture, functions, and establishment of agribusiness management information systems to provide decision information. The focus of this course is on the information technologies and the resources that organizations provide and alternative approaches to managing them; and what the user-manager needs to know to make

effective use of these technologies. It contains:(1) Introduction; (2) Organization of Information Systems; (3) Buildup of the Information Systems; (4) Modern Management Information Systems for Agribusiness.

502046 溝通與領導 (3 選)

洪惠貞 下

企業經營者往往必須學有專精、擅於管理，具備帶領組織穩定成長的能力。但促使組織得以持續發展並開拓成長空間則有賴於經營者圓熟的溝通技巧和揮灑自如的領導魄力。本課程分為兩大部分，第一部分探討領導的本質，說明領導者應具備的個人風範，如何善用權力、影響力，擬定精確而長遠的目標；懂得激勵員工與充分授權以帶領組織邁向勝利與成功。第二部分探討溝通技巧。領導者必須具備高瞻遠矚的視野，高效率的溝通協調能力使其得以因應變局、開創新局、化危機為轉機。在資訊傳播無遠弗屆的年代，因地制宜的溝通訊息與技巧有助於管理功能達到最大的效果與影響力。領導者也必需懂得善用資訊，掌握意義重大的趨勢巨流，並轉化為組織成長契機。邁入全球化舞台，面對新世代的挑戰，隨時接受新知，培養良好溝通協調能力，無疑是領導人物必修的一門課。

502046 Communication and Leadership (3E)

H.J. Hong, S

Entrepreneur must be professional, be skillful of managing, and possess leadership guiding organization grow steadily. Concern with organization's sustainability and development, it would depend on the manager's mellow communication skills and high performance leadership. This course is divided into two parts, the first part discusses the nature of leadership, indicating that a successful leader's personal style, Machiavellian, power and influence, and developing precise and long-term objectives. A leader should know how to motivate employees and empower authority so as to lead the organization toward victory and success. The second part discusses communication skills. A visionary leader possesses great foresight. With high efficient communication and coordination skills, leaders know how to cope with dilemma, create innovation, and break through the crisis into an opportunity. In the era of far-reaching dissemination of information, resourceful techniques of communication and coordination can contribute to management function result in maximum effect and influence. Leaders must know how to use information better, to grasp significant trends in sage, and transform to organizational opportunities for growing. In the global arena, leaders are facing new generation's challenges. It is so important for leaders to learn new knowledge and cultivate communication and coordination skills.

502050 農企業營運計畫撰寫 (3 選)

黃文琪 上

本課程主要在教導學生如何撰擬「農企業營運計畫書」；藉由「營運計畫書」管理者可檢視其創業目標、產品、定位、市場分析等是否詳實；更攸關其創業的可行性與成功機率。課程內容包括下列主題之撰寫：(1) 摘要 (2) 營運動機與產業背景 (3) 農產品或服務之經營概況；(4) 市場研究與分析 (5) 行銷計畫 (6) 營運計畫 (7) 管理團隊 (8) 財務規劃 (9) 結論與願景。

502050 Writing for Agribusiness (3 E)

W.C. Huang, F

Operate Prospectus

This course intends to teach students how to write an operating plan for an agribusiness. Entrepreneurs can look over their goal, products, market positioning, market analysis, etc. to make sure that they are comprehensive and accurate to start an undertaking; moreover, it will affect the feasibility and the chance of success. The course content includes the writing of the following topics: (1) Summary (2) Operation motive and industry background (3) Overview of agricultural products or the service; (4) Market survey and analysis (5) Marketing plan (6) Operation plan (7) Management team (8) Financial plan (9) Conclusion and Prospect.

502051 大陸經貿與農企業 (3 選)

段兆麟 上

大陸是台灣農企業重要的投資市場。台灣廠商前往大陸的投資件數已達二萬餘件，總金額達百餘億美元。隨著台灣經濟的全球化，兩岸經貿互動將更密切。本課程旨在講述大陸各類型農企業的發展環境，農企業經營與管理，問題與展望等內容。期使學生熟悉大陸農企業的發展條件，經營管理的方法，以裨益經營決策。課程內容大要：1.兩岸經濟與貿易現況 2.大陸農業發展與政策 3.大陸鄉鎮企業 4.大陸農業產業化經營 5.大陸農企業發展現況 6.大陸農企業土地取得與管理 7.大陸農企業人力管理 8.大陸觀光休閒農業 9.大陸農業經營問題探討 10.大陸農企業出國觀摩。

**502051 The Economy and Agribusiness (3E)
in Mainland China**

C.L. Tuan, F

This course provides a comprehensive introduction to the management of agribusiness in China Mainland. The content is as following: 1. The cross-strait economy and trade at present stage; 2. Agricultural development and policies in Mainland China; 3. Country business in Mainland China; 4. Industrialization of agriculture in Mainland China; 5. Development of agribusiness in Mainland China; 6. The acquirement and management of land in Mainland China; 7. Human resources management in Mainland China; 8. Tourism and leisure agriculture in Mainland China; 9. Issues of agribusiness in Mainland China; 10. Visiting abroad to the agribusiness in Mainland China .

506052 農產品貿易實務 (3 選)

彭克仲 上

農產品貿易有別於工業產品，因其生命性、易腐性、季節性、地區性，討論農產品貿易實務宜包括產品之區域、產量、季節、分級、包裝、運輸儲藏條件、主要生產者；目前已有農產品貿易公司之活動狀況；國貿作業流程及市場推廣技巧；貿易條件及價格計算；貿易與金融；貿易與運輸；貿易與報價；貿易與保險；貿易與糾紛；貿易公司之運作。

**506052 Agricultural Products (3E)
Trade Practice**

K.C. Peng, F

The purpose of this course is to provide student to understand the practical agricultural products trade operation, in order to integrate the theory and practice of agricultural products trade. The content of Agricultural Products Trade Practice are recognizing products, trade flow, terms of conditions, trade and finance, trade and transportation, trade and insurance, trade and claim, trade company operation.

七、課程與核心能力關聯表：

(一)農園生產系

科目名稱 \ 核心能力項目	1. 具備 農業與 農業科 技相關領 域之基本 專業知識 與技能。	2. 具備 農業生 產相關領 域之基本 專業知識 與技能。	3. 具備 農產品行 銷與貿易 相關領域 之基本專 業知識與 技能。	4. 配合 團隊合作 精神，達成 實務專題 製作能 力。	5. 具備 全球化思 考能力，及 參與農企 業相關之 國際交流 活動之能 力。
園藝學	V	V	V	V	V
作物病蟲害管理與診斷	V	V	V	V	V
作物病蟲害管理與診斷實習	V	V	V	V	
農業機械	V	V	V	V	V
農業機械實習	V	V	V	V	
作物學	V	V	V	V	V
糧食作物學	V	V	V	V	V
糧食作物學實習	V	V	V	V	
蔬菜學	V	V	V	V	V
蔬菜學實習	V	V	V	V	
設施園藝	V	V	V	V	V
設施園藝實習	V	V	V	V	
果樹學	V	V	V	V	V
果樹學實習	V	V	V	V	
花卉學	V	V	V	V	V
花卉學實習	V	V	V	V	
遺傳學	V	V	V	V	V

遺傳學實習	√	√	√	√	
特用作物學	√	√	√		
特用作物學實習	√	√	√		
農業氣象	√	√	√	√	√
土壤與肥料	√	√	√	√	√
有機農業概論	√	√	√	√	√
農園產品處理學	√	√	√	√	√
農園產品處理學實習	√	√	√	√	
植物繁殖技術	√	√	√	√	
植物繁殖技術實習	√	√	√	√	

(二)水產養殖系

科目名稱 \ 核心能力項目	1. 具備水產養殖專業知識之基本能力。	2. 具備探索科學新知的興趣與熱忱。	3. 具備水產養殖實務操作之能力。	4. 具備團隊合作、溝通與抗壓能力。	5. 具備穩健、耐性、務實及責任心。
水產養殖學	√				√
水產繁殖學	√	√	√	√	√
水產飼料學	√	√			
水質學	√				
水質學實習	√	√	√		√
水產養殖學實習	√	√	√		√
餌料生物學	√				
餌料生物學實習	√	√	√	√	√
水產繁殖學實習	√	√	√	√	√

水產飼料學實習	✓	✓	✓	✓	✓
魚病學	✓			✓	
魚病學實習	✓			✓	✓
觀賞魚養殖與管理	✓				
觀賞魚養殖與管理實習	✓	✓	✓	✓	✓

(三)食品科學系

科目名稱 \ 核心能力項目	1. 具有食品科學基礎專業能力	2. 具有專業操作技術能力	3. 具有專業統合及溝通合作能力	4. 具有語文應用及國際觀
普通化學(1)	✓			
普通化學實驗(1)	✓	✓		
生物統計	✓			
生物統計實習	✓	✓		
實務專題	✓		✓	
自家實習農場	✓	✓	✓	
食品加工(1)	✓		✓	
食品加工實習(1)		✓		
微生物學	✓		✓	✓
微生物學實驗	✓	✓		
食品衛生與安全	✓		✓	
食品行銷	✓		✓	✓
發酵學	✓	✓	✓	

發酵學實驗	V	V		
食品生鮮處理技術	V		V	
食品生鮮處理技術實習		V		

(四)農企業管理系

科目名稱 \ 核心能力項目	1. 具備農場企業與農民組織相關領域之基本專業知識與技能。	2. 具備休閒農業相關領域之基本專業知識與技能。	3. 具備農產品行銷與貿易相關領域之基本專業知識與技能。	4. 配合團隊合作精神，達成實務專題製作能力。	5. 具備全球化思考能力，及參與農企相關之國際交流活動之能力。
農企業管理	V	V	V	V	V
休閒農業	V	V	V	V	V
農產行銷	V	V	V	V	V
農業生物科技產業概論	V				
農業發展與政策	V				
農業概論	V				
農企業管理資訊系統	V	V	V	V	V
溝通與領導	V	V			
農企業營運計畫撰寫	V	V			
大陸經貿與農企業			V		V
農產品貿易實務			V		V

傳閱附件 4--動物科學與畜產系 106 學年度「產學攜手計畫專班四年制課程」規劃案

四年制動物科學與畜產系「產學攜手計畫專班」

(一)教育目標

為提升台灣禽畜產業之競爭力，結合畜產科學與生物科技，培育具備畜禽遺傳育種改良技術、高效率繁殖生產技術、現代化禽畜舍規劃與飼養管理技術、飼料配方設計與製造技術、安全畜產品開發與利用技術、實驗動物飼養管理技術及永續禽畜場管理技術等專業人才。同時，應用理論與實務並重之課程模組，養成兼具社會道德倫理與多元文化素養之現代化經濟動物生產之技術管理人才，以開拓續產業之新契機。

(二)校定共同必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
通識課程 General Education	12	2	2	2	2			2	2	通識選項課程： 人文學科：2 門 社會科學：3 門 數理與應用科學：1 門
國文 Chinese	4	2	2							國文(閱讀與寫作)(1) 國文(閱讀與寫作)(2)
大一英文 Freshman English	4	2	2							大一英文(1) 大一英文(2)
英語聽講練習 101~102 English Listening & Speaking Practice	2	1	1							英語聽講練習 101 英語聽講練習 102
憲法 Constitution	2				2					
體育 Physical Education	2	1	1							
通識教育講座 Lectures on General Education	1	1								各系依序開課，開 課學期不定
外語實務 Foreign Language Proficiency Test	0	0								畢業前修畢 通過標準依「外語 實務課程實施要 點」規定
合 計	27	9	8	2	4	0	0	2	2	

(三) 學院共同必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
普通化學(1) General Chemistry(1)	3	3								
普通化學實驗(1) General chemistry Lab.(1)	1	1								
生物統計 Biometry	2	2								
生物統計實習 Practice of Biometry	1	1								
實務專題 Special Projects	2							1	1	
合 計	9	7	0	0	0	0	0	1	1	

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
禽畜保健實習 Practice of Livestock Health	1							1		
乳蛋品原料與利用 Raw Material Quality and Utilization of Milk and Eggs	2							2		
肉品原料與利用 Raw Material Quality and Utilization of Meat	2								2	
合 計	53	3	10	7	8	9	9	5	2	

(五)專業選修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
畜產品營養與健康 Nutrition and Health of Animal	2	2								
動物行為 Animal Behavior	2	2								
畜產機械 Animal Production Machinery	2	2								
畜產機械實習 Practice of Animal Production Machinery	1	1								
畜產生物多樣性 Biodiversity in Farm Animal	2	2								
畜產檢驗與分析 Analysis of Animal Products	2	2								
畜產檢驗與分析實習 Practice of Animal Products Analysis	1	1								
動物福祉 Animal Welfare	2		2							
農業政策與法規 Agricultural Policy and Laws	2		2							
飼料製造技術 Feed Manufacture Technology	2		2							
飼料製造技術實習 Practice of Feed Manufacture Technology	1		1							
芻料作物及其調製 Forage Production and Utilization	2		2							
動物內分泌學 Animal Endocrinology	2			2						
禽畜環境生理學 Environmental Physiology of Domestic Animals	2			2						
飼料分析與品管 Feed Analysis and Quality Control	2			2						
飼料分析與品管實習 Practice of Feed Analysis and Quality Control	1			1						
肉用草食家畜飼養管理 Meat-production Ruminant Farm Animal Feeding and Management	2			2						

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
畜產與氣候變遷 Animal Production and Climate Change	2								2	
畜產品在美容之應用 Application of Animal Products on Beauty Industry	2								2	
農業財務概論 Introduction of Agricultural Finance	3								3	
畜產經營學 Livestock Production Management	2								2	
休閒畜牧實務技術 Leisure Animal Farm Management	2								2	
屠體分切與應用 Carcass Cutting and Application of Meat Parts	2								2	
合計	75	12	9	12	10	0	0	15	17	

動物科學與畜產系

Department of Animal Science

專業必修科目 Required Courses

- | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----------------------|-----|
| 262001 生物統計 | 2 | 必 | 張秀鑾 | 上 |
| <p>本課程旨在使學生瞭解生物資料分析之統計原理、方法與統計相關基本名詞，授課內容包括數據資料之特性及整理方式介紹、敘述統計，機率與機率分布、估計、假設檢定、卡方分析、變方分析，迴歸與相關。</p> | | | | |
| 262001 Biometry | 2 | R | H. L. Chang | F |
| <p>The aims of this course are to introduce the principles and methods of statistics, as well as the related basic terminology for life science data analysis. The course covers the introduction of data characteristics and management methods. However, descriptive statistics, probability and probability distributions, estimation, hypothesis test, chi-square analysis, analysis of variance, as well as regression and correlation analysis are also included.</p> | | | | |
| 262002 生物統計實習 | 1 | 必 | 張秀鑾 | 上 |
| <p>本實習依上課進度進行數據整理，以敘述統計、各項分布（常、二項式、多項式、卜瓦松、t-、卡方與F分布）、估計、假設檢定、變方分析、迴歸及相關等原理，應用生物數據實例進行練習。</p> | | | | |
| 262002 Practice of Biometry | 1 | R | H. L. Chang | F |
| <p>The lab. proceeds with the lectures of biometry. The practice of this course focus on exercises of biological data management and the application of descriptive statistics, useful distributions (Normal, binomial, polynomial, Poisson, t-, chi-square and F) theory, estimation protocol, hypothesis test, analysis of variance, regression and correlations techniques on data analysis for biologists.</p> | | | | |
| 262003 實務專題 | 2 | 必 | 全系教師 | 上、下 |
| <p>本課程由教師輔導學生選定其有興趣之試驗題目，進行動物飼養管理、生產技術操作或實驗室內之試驗、分析，並將實驗結果撰寫報告。</p> | | | | |
| 262003 Special Projects | 2 | R | Faculties | F、S |
| <p>The students will select their special topics of interest and advisor with the specialty to instruct him. Course contents include laboratory research, analysis techniques, and farm animal management. The experimental results have to be presented and written in report.</p> | | | | |
| 262004 動物學 | 2 | 必 | 沈朋志、彭劭于 | 上 |
| <p>本課程之設計主要是幫助學生了解動物之演化、分類與生理功能，內容包括器官的發育、細胞分裂與遺傳、動物行為與生態、原生生物、假體腔動物、軟體動物、環節動物、節肢動物、昆蟲、魚類、兩生類、爬蟲類、鳥類、哺乳類。</p> | | | | |
| 262004 Zoology | 2 | R | P.C. Shen, S.Y. Peng | F |
| <p>The object of this course is helping the students to understand the evolution, classification and physiological function of the animal. The contents include: development of tissue, organ, system, cell division and inheritance, animal behavior and ecology, protozoa, pseudocoelomate body plan, molluscan, annelida, arthropod, hexapod, fish, amphibian, reptile, bird and mammal.</p> | | | | |
| 262005 動物學實習 | 1 | 必 | 彭劭于 | 上 |
| <p>本課程之設計主要是幫助學生學習動物的一般構造及功能，內容包括光學顯微鏡使用、動物細胞及原生生物外部構造之觀察、蚯蚓及蝦解剖構造之觀察、以及脊椎動物之循環、呼吸、排泄、生殖、肌肉、消化與骨骼等系統解剖構造的瞭解。</p> | | | | |
| 262005 Practice of Zoology | 1 | R | S.Y Peng | F |

The object of this course is helping the students to learn the general structure and function of animal. The contents include: utilization of light microscopy, observing the external features of animal cells and protozoas, observing the anatomic structures of pheretima, and crayfish, understanding the anatomic structures of circulatory, respiratory, excretory, reproduction, digestive, muscle and skeleton systems of vertebrates.

262006 畜產微生物學 2 必 林美貞 下

本課程講授微生物之特性及分類、原核細胞之結構、細菌之分類及鑑定、真核細胞之結構、真菌、原生生物及寄生蟲、病毒之分類及鑑定、微生物之生長、微生物之營養與代謝、微生物之控制及於基因工程之應用。並針對畜產相關之微生物加以探討，包括畜產品原料中微生物之性質和殺菌條件、原料之貯存技術、發酵微生物之加工特性及成品之微生物變敗。

262006 Microbiology of Animal Products 2 R M. J. Lin S

This course includes characteristics and classification of microorganisms, structure of procaryotes, classification and identification of bacteria, structure of eukaryotes, fungi, protists, parasites, classification and identification of virus, growth, nutrition and metabolism of microorganisms, microbial control, and genetic engineering. The course will focus on the microbiology related to animal production, including microbial control of animal products, properties and destruction of microorganism in animal products, storing technique of raw materials, processing characters of fermented culture, and microbial spoilage final products.

262007 動物解剖生理學 3 必 余祺、劉世華 下

本課程以解剖學為基礎，依生理系統介紹禽畜之身體各部位構造與功能，依次分別為骨骼、肌肉、神經、血管循環、呼吸、消化、吸收、代謝、排泄、內分泌及生殖等系統。

262007 Anatomy and Physiology of Animal 3 R C. Yu, S. H. Liu S

The object of this course will introduce animal anatomy and physiology with organ system. The lectures contain skeleton system, joints, muscles system, nerves system, cardiovascular system, respiratory system, digestion system, urinary system, endocrine system and reproductive system.

262008 遺傳學 2 必 張秀鑾 下

本課程旨在介紹遺傳學基本原理與解說生物體之遺傳特徵在世代間如何傳遞、遺傳密碼如何複製與表現，及其變異原因。課程內容包括古典孟德爾遺傳學、基因表現與交感、連鎖與性聯遺傳、遺傳之染色體學說、DNA 之遺傳功能、複製、重組、轉錄與轉譯；最後簡介突變與核外遺傳對家畜之影響。

262008 Genetics 2 R H. L. Chang S

The objectives of this course are to introduce the principles of genetics and to state how the genetic characteristics being transmitted between generations, how the genetic code being replicated and expressed, and the causes of variation. It covers major topics usually taught in an introductory course, including classical Mendelian genetics, gene expression and interaction, linkage and sex linked inheritance, chromosome theory of inheritance, genetic function of DNA, replication, recombination, transcription and translation. In addition, both mutation and extranuclear inheritance are to be briefly introduced but not covered in detail.

262009 肉品原料與利用 2 必 陳志銘 下

本課程介紹畜產品原料的種類與特性，使學生對乳、肉、蛋及禽肉與副產物的特性有概括認識，並可提供往後研習肉品、乳品與蛋品加工之參考。主要內容包括各種畜產食品原料之構造、特性、組成營養價值、影響產品原料之因素以及原料之貯存與處理等。

262009 Raw Material Quality and Utilization of Meat 2 R C.M.Chen S

This course will discuss the types and characteristics of animal product materials, in order to

give students a basic insight into the materials of meat, milk, egg, and poultry meat and their by-products, and for the further study of meat, dairy and egg processing technique. The major contents conclude structure, characteristics, and composition of materials, functional properties of raw materials of animal products quality influencing factors, storage and handling of materials, and etc.

262010 生物化學 3 必 劉世華 上

本課程主要提供學生對於生物體內構成物質及其生物化學作用之基本認知，以作為修習營養學、遺傳學等之基礎。課程內容包括：1.生物體之構成物質－包括碳水化合物、蛋白質、脂質等之構造與代謝；2.生物能量之代謝；3.生化反應之催化及控制－酵素；4.遺傳訊息之傳遞－核酸。

262010 Biochemistry 3 R S. H. Liu F

This course offer students the basic concepts of Biochemistry for further studying in nutrition and genetics. The contents include : the structure and metabolism of carbohydrates, proteins and lipids; the metabolism of energy; biochemical reaction catalysis and regulations－enzymes; and genetic control－nucleic acids.

262011 乳蛋品原料與利用 2 必 林美貞 上

本課程介紹畜產品加工利用的方式與種類，使學生對乳、蛋與副產物利用有概括認識，並可提供往後研習乳品與蛋品加工之參考。主要內容包括各種畜產食品之原料特性、加工原理、以及加工步驟等。

262011 Raw Material Quality and Utilization of Milk and Eggs 2 R M. J. Lin F

This course will discuss the methods and type of animal products utility, in order to give students a basic insight into the meat, milk, egg, and poultry meat and their by-products utilization, and for the further study of meat processing and egg processing technique. The major content concludes animal food on structure and composition, functional properties of raw material of animal products, processing principles and procedures

262012 牧場實務實習 2 必 牧場主任 上、下

本課程之目的在使學生在牧場實務實習中，將所學理論與實際配合，在操作中學習。課程內容包括，畜牧之現在及未來之展望、牧場工作簡介、養豬實習、蛋雞實習、肉雞實習、種雞實習、孵化實習、肉牛實習、乳牛實習、牧草管理、犬隻管理。

262012 Practice of Animal Farm 2 R Head of Livestock Farm F、S

The purpose of the course is to let students match the theory and practice, to reach the goal of training-learning by doing. The following items are included future and past of animal production, introduction of animal farm, practice of swine production, practice of layer production, practice of broiler production, practice of feeder production, practice of hatchery production, practice of beef cattle production, practice of dairy cattle production, management of grassland, management of dogs.

262013 動物育種學 3 必 張秀鑾 下

本課程之目的在解析家畜育種學原理，並介紹各種育種技術於家畜改良計畫之應用。課程內容包括族群基因頻率、簡單與多基因遺傳性狀、選拔原理與應用、配種制度、數量性狀之遺傳模式、遺傳參數估計與應用、生物技術發展與家畜育種之應用。

262013 Animal Breeding 3 R H. L. Chang S

The objectives of this course are to provide an understanding of the principles of animal breeding and to introduce the application of animal breeding techniques in farm animal improvement programs. Material includes gene frequencies in populations, simple-inherited and polygenic traits, selection, mating systems, genetic models for quantitative traits, estimation and application of genetic parameters, development of biotechnology and its application in animal breeding.

262014 動物營養學 2 必 謝豪晃 上

本課程主要討論動物營養學的原理，包括：營養學的發展、動物營養消化生理、飼料的營養組成分、消化率測定、營養需要量測定、營養素的代謝利用過程，包括碳水化合物、脂質、蛋白質、礦物質、維生素及水之代謝；最後並討論營養性疾病及營養知識的應用。

262014 Animal Nutrition 2 R H. H. Hsieh F

This course will discuss the principle and application of animal nutrition. The contents include : the development of nutrition, digestive physiology, the composition of feed, the measurement of digestibility, the metabolism of nutrients ; carbohydrates, fats, proteins, minerals, vitamins and water ; nutritional deficiency and application of nutritional knowledge.

262015 經濟動物繁殖學 2 必 沈朋志、彭劭于 上

本課程著重於討論禽畜繁殖問題及新近發展之繁殖技術，包括雌雄種畜生殖機能之評估與改善，繁殖管理之新觀念與方法，生殖性狀之選拔，人工授精與體外授精技術之應用，性別選擇，配子和胚之顯微操作及保存，與胚移置技術等，並以有助於解除緊迫環境下禽畜之繁殖困擾者為優先。修習本課程之學生可藉課堂討論與國內外相關文獻之閱讀以掌握繁殖技術之最新發展，提升改善禽畜繁殖效率之能力。

262015 Reproduction of Farm Animal 2 R P.C. Shen, S.Y. Peng F

The objective of this course is to give the students more confidence in their abilities for improving the reproductive efficiency of the livestock. Dealing with the modern concepts and the recent techniques in livestock reproduction, it consists of the following subjects: evaluation and improving of the reproductive functions of the breeding livestock; reproductive management; selection on the reproductive characteristics; methods of sex selection; applications of artificial insemination and in vitro fertilization; micromanipulation and preservation of the gametes and embryos; the technique of embryo transfer; and so on. The topics being put in the priority are those techniques that are capable of being used for restoring the prevalent reproductive failure of the livestock under the environmental stress. For catching up the new developing concepts.

262016 家禽飼養管理 1 必 謝豪晃 下

本課程介紹家禽飼養管理之理論與實務作業技術，包括：家禽品種，種蛋經營，孵化作業，育雛及一般飼養管理，雞舍與設備操作，疾病防治與產品屠宰、包裝及銷售等事務，使學生對家禽產業之整合，生產現況與未來發展有全盤之認識。

262016 Poultry Feeding and Management 1 R H. H. Hsieh S

The objective of this course is to introduce the theory and practical operation technique of poultry to the students. The contents include : breeds and students of poultry, management of breeders, hatching operation, brooding and rearing, houses and equipment operation, disease control, processing and marketing products .

262017 家禽飼養管理實習 1 必 謝豪晃 下

本課程實習內容主要配合「家禽飼養管理」課程，使學生實際進行生產過程所需要之操作訓練，包括：種蛋之處理、孵化技術、飼養試驗、配合課程之需要邀請現場人員作專題研討、並參觀實習，包括：自動化飼養系統、屠宰作業、雞蛋洗選包裝等，使學生充分瞭解家禽生產之作業技術。

262017 Practice of Poultry Feeding and Management 1 R H. H. Hsieh S

This practice course is associated with the poultry productive technique to enforce the students on the skill and technique part through field practice. Learning by doing is the basic concept of technique education. In this course students are allocated into groups to operate the whole process for poultry production, include : hatching eggs operations, hatchery technique and feeding trials. In addition there will be seminars and direct discussion with industry people, field trip to commercial farm processing plant, etc, Through this practice

course students will get a comprehensive knowledge of poultry production.

262018 豬隻飼養管理 1 必 翁瑞奇 下

本課程目的在於介紹台灣高溫多濕的環境下，養豬事業之成就與豐富之經驗以及國內外養豬業之先進技術與科學知識。其內容包括豬隻生理解剖、遺傳育種、品種選拔與改良、生物技術與生殖、營養與飼料、飼養管理、環境與污染控制、經濟經營規模與市場產銷等知識，再配合實際操作，使學生參與養豬現場之訓練，以期成為務實之經營者。

262018 Pig Feeding and Management 1 R R.C. Weng S

The purpose of this course is to introduce a technical basis and rich experience for successful production of swine industry under the high temperature and high moisture environments in Taiwan, and to provide the current new knowledge and technology of the world's swine science. The contents of this course advance in swine: physiology and anatomy, genetics and breeding, breeds selection and improvement, biotechnology and reproduction, feeds and nutrition, feeding and management, environment and waste control, economic size and marketing and so on. The practical training on-farm can be enhanced in this course.

262019 豬隻飼養管理實習 1 必 翁瑞奇 下

實習內容在使學生實際從事養豬技術、規劃及經營之訓練，以造就成為真正養豬經營之專業人才，諸如品種與選種評分、豬場清洗與消毒、分娩介助、發情觀察與配種、豬場紀錄規劃、豬舍建築設計與豬舍配置規劃、飼料需求量估計、飼養成本之概估、經濟經營規模擬定、投資報酬之分析、市場供需資料之搜集及總生產成本與收益之計算與分析。

262019 Practice of Pig Feeding and Management 1 R R.C. Weng S

The contents of swine productive practice are to provide a training of students on technique, planning and management of swine production. It contains: swine breeding and selection, washing and sanitation of pig house, farrowing nurse, estrus observation and service, productive record, design and scaling of growing-finishing house and farrowing house, requirements of feeds, feeding cost, the decision of economic size, the analysis of investment and margin, collecting the information of the supply and demand on market, calculation and analysis of the total cost of production and total revenue.

262020 禽畜保健 2 必 獸醫系 上

本課程目的在使學生瞭解重要禽畜疾病之理論與實際及簡單外科手術。其中包括有關傳染性、內科性及繁殖性疾病之控制、消毒及預防措施，並同時教導學生有關外傷性之簡單外科處理技術。期能使學生瞭解疾病之發生、處理及預防方法。

262020 Livestock Health 2 R Dept.of Veterinary F

This course will introduce students the theory of important domestic animal diseases and simple surgical techniques. It provides students general knowledge of disease control; aseptic procedure; and prevention of infectious diseases, internal diseases and reproductive disorder. It also teaches students basic surgical techniques for wounds care. Students are expected to understand the knowledge of diseases occurrence, and the methods of medical treatment and disease prevention.

262021 禽畜保健實習 1 必 獸醫系 上

本課程配合正課，著重於疾病診斷與預防，主要在提供學生對於禽畜傳染性、內科性及繁殖障礙性疾病之控制、消毒及預防等基本概念與操作，並教導簡單之外科縫合技術。期能使學生瞭解疾病之處理及預防之實際處理方式。

262021 Practice of Livestock Health 1 R Dept. of Veterinary F

This course introduces the method of diseases diagnosis and prevention. It provides the basic concepts and operative practices in diseases control; aseptic procedure; and prevention

in animal infection diseases, internal diseases and reproductive disorder. It also teaches students basic and practical surgical techniques.

262022 乳用家畜飼養管理 1 必 吳錫勳 上

本課程主要著重於熱帶地區高溫多濕環境下乳用家畜飼養管理之理論與實務，對於擠乳管理、電腦管理系統，完全混合日糧飼養系統，畜舍降溫裝置，最新反芻營養科技資料以及乳用家畜較常發生之疾病與其防治加以闡述，以訓練學生對於經營農場更具信心。

262022 Dairy Livestock Feeding and Management 1 R H. H. Wu F

This course lays special emphasis on the feeding and management of dairy livestock in the high temperature and humid environment. This includes milking management, computer management system, TMR feeding system, house cooling equipment, recent ruminant nutrition knowledge, disease and control of dairy cows, this will give the students more confidence in running the dairy farm.

262023 乳用家畜飼養管理實習 1 必 吳錫勳 上

本課程之內容旨在讓學生熟悉乳用家畜管理技術，例如人工授精與妊娠診斷，公牛精液選擇，擠奶機功能檢測，血液檢查，粗料乾物質快速測定；營養代謝性疾病之認識與檢測；並鼓勵學生多與民間乳牛場接觸，以發掘現存之問題與設法解決達到理論與實際之配合。

262023 Practice of Feeding and Management in Dairy Livestock 1 R H. H. Wu F

The purpose of this course is to give the students more familiar with the management tool of dairy livestock. This includes artificial insemination and pregnancy diagnosis, bull frozen semen selection, milking machine function testing, blood test of dairy cow, rapid testing of roughage dry matter contents, nutritional metabolic disorders. The students were encouraged to visit private dairy farm so that they could learn more problems and try to find solutions

262024 校外實習 18 必 全系教師 上、下

本課程目的在，讓學生於校內學習後，對產業的運作有初步的認識與瞭解後。進而實際投入產業的運作，更進一步讓學理與實際的配合，更能充分瞭解的全程實際運作，時所遇到的問題與結局方法的訂定。作為日後投入業界的基礎訓練。

262024 Practice of Industrial Training 18 R Faculties F、S

This course aims to enable students to learn at school after the initial operation of the industry's awareness and understanding later. And thus the operation of actual investment industry, further to the theoretical and practical cooperation, better understanding of the actual operation of the whole, the problems encountered when the method set with the outcome. The basis for future investment in industry training.

專業選修科目 Elective Courses

262025 畜產品營養與健康 2 選 陳志銘 上
畜產品包括乳品、肉品、蛋品是人類優良的食物來源之一，尤其是人類的主要蛋白質來源，對人類健康有舉足輕重的影響。本課程主要介紹乳品、肉品、蛋品之主要營養成分：水分、蛋白質、脂肪、維他命、礦物質及其他微量元素，還包括部分重要機能性成分；並進一步說明這些營養素對人體健康的優點、貢獻及影響；尤其是其機能性保健成份對人體健康與保健的效果及加工時應注意事項。其次，也會探討攝食畜產品的正確觀念，使大眾可以健康、安心地享受美食。

262025 Nutrition and Health of Animal 2 E C.M.Chen F
Animal products, including milk, meat and egg products, are one of the major excellent food sources, especially, those are major protein resources of human being, and are quite important for human health. This course mainly introduces the major components, including moisture, proteins, fats, vitamins, minerals and other microingredients, milk, meat and egg, as well some vital functional ingredients of them. Furthermore, it also illustrates the merits, contribution and effects of those nutrients for human health. Especially, it focuses the human health and functional efficiency of those functional ingredients and the matters needing attention during the processing procedures. The next, this course investigates the correct concept to intake animal products, and make the people can feeling at ease to enjoy the feats in healthy way.

262026 動物行為 2 選 翁瑞奇 上
本課程在使學生瞭解動物行為學之一般原理，課程內容包括：什麼是行為、適應性行為、簡單行為、生物節奏與時鐘、訊號刺激、行為的基因基礎、生理準備、學習、銘印、遷移、社會行為、溝通、統治階級、領域、性行為、轉移動作及社會生物學等。

262026 Animal Behavior 2 E R. C. Weng F
This course is on introduction to the study of general concepts of animal behavior. It is offered to cover topics such as what is behavior?; behavior as adaptation; simple behavior; biological rhythms; sign stimuli; the genetic; physiological readiness; learning; imprinting; migration; social behavior; communication; dominance; territoriality; sexual behavior; displacement activity; and sociobiology.

262027 畜產機械 2 選 生機系 上
本課程之目的為介紹畜產機械之種類構造原理利用與維護，其內容包括緒論、機械原理、牧草地之造成機械、畜舍建築及管理利用機械、放牧利用之設施與機械、畜產品加工利用與機械及畜舍廢棄物處理與利用機械等。

262027 Animal Production Machinery 2 E Dept. of Biomechatronics Engineering F

The subject of this course contains structure utilization and maintenance of animal husbandry machinery. Main topics include introduction, theory of machines, reclamation machinery for pasture, animal house management machines, pasture machines and installations, equipment for animal products, and equipment for livestock wastes.

262028 畜產機械實習 1 選 生機系 上
本課程為配合正課實際需要，其重點為注重操作管理及維護保養以達到理論與實際技術相配合，其內容包括汽柴油引擎之維護保養與實習、曳引機駕駛維護保養與實習、牧草機操作機械保養與實習、畜舍建築及利用機械操作實習、自動給飼機械之操作及保養實習、畜產品加工利用機械實習及畜舍廢棄物處理及利用機械操作保養實習。

262028 Practice of Animal Production Machinery 1 E Dept. of Biomechatronics Engineering F

This practice course provides essential technology training for students to operate, and

maintenance for animal husbandry machinery. Main topics include training to skill of operate and maintenance for diesel engine, training to skill of operate and maintenance for tractor, forage harvesting operate and maintenance, animal house management machines, automatic feeding machine, equipment for animal products, and equipment for livestock waste.

262029 畜產生物多樣性 2 選 張秀鑾 上

本課程旨在介紹生物多樣性維護之理論基礎、種原基因保存、管理與應用機制，以達到動物遺傳資源永續利用之目的。課程內容包括台灣畜產資源簡介、畜產動物活體與離體保存法、國內外畜產遺傳資源交流國外機制、國際條約與國內相關法規等。

262029 Biodiversity in Farm Animal 2 E H. L. Chang F

The objectives of this course are to state the fundamental theory of biodiversity maintenance, germplasm preservation, management and application mechanism for sustainable utilization of farm animal. Material includes an introduction of Taiwan farm animal genetic resources, both in- and ex-situ conservation protocols, and exchange mechanism of genetic resources for local and global usages, as well as acts, rules and regulations applied to nation and international purpose.

262030 動物福祉 2 選 翁瑞奇 下

本課程之目的在使學生能深刻瞭解動物福利，以為從事畜牧生產之基礎。課程內容包括：動物福利定義、緊迫對動物的影響、動物福利和產業之關係、各種家畜禽動物之福利。

262030 Animal Welfare 2 E R. C. Weng S

The arrangement of this course is to let the students understand the knowledge about animal welfare. The following topics included in the course: definition of animal welfare, the influence of stress on farm animals, animal welfare, animal welfare and industry, and specific topic of animal welfare on different farm animals.

262031 農業政策與法規 2 選 張秀鑾 下

本課程旨在介紹農業政策的意義、內容與相關法規，培養學生具備農業動物資源政策分析與援用相關法規之能力。課程內容包括農業政策、畜牧法規與施行細則、農業資源管理、畜產品生產與廢棄物資源化等有關法令，藉以充實法律常識、培育動物科技人員兼具專業與法律素養。

262031 Agricultural Policy and Laws 2 E H. L. Chang S

The objective of this course is to introduce the concept and contents of agricultural policy, laws and regulations related to animal industry, and thus provide students with the ability of invoking an article of law or regulations. Material includes current agricultural policy, animal industry act and the enforcement rules, rules or regulations for management of agricultural resources, and for animal production as well as for waste treatment law with promoting in both reducing waste and recycling resources.

262032 畜產檢驗與分析 2 選 吳錫勳 上

本課程之設計主要在介紹正確的分析方法，儀器的正確使用，以減少分析結果之誤差，配合畜產品之品質檢查方法及配合畜產品製造流程之品管現代技術，內容包括：一般成分分析及精密儀器的基本操作、方法、原理和應用等。

262032 Analysis of Animal Products 2 E H. H. Wu F

This course is designed to give the students to use the instruments correctly and accurately, to reduce the analytical error, to assist the students to understand the modern technique about the detection of the ingredients and the quality control of the formula feeds. The contents include basic operation of proximate composition analysis, and methods, principles and applications of instrument analysis for animal products.

262033 畜產檢驗與分析實習 1 選 吳錫勳 上

本實習內容主要是配合「畜產品檢驗與分析」課程，使學生實際進行所需要之操作訓練；其內容包括：實驗室的安全認識、採樣及分析基本訓練、畜產品各項分析的分析方法及儀器操作等。

262033 Practice of Animal Products Analysis 1 E H. H. Wu F

This practice course is in associate with the course of analysis of animal products to provide the training to students on this technique. The contents include the safety of laboratory, sampling and basic operation of analysis, the methods that may be employed for the detection and determination of animal products.

262034 動物內分泌學 2 選 沈朋志 上

本課程主要講授家畜內分泌腺（組織）所分泌的激素種類、調節作用機轉、下視丘和腦下腺間之相互調控，及各激素的生理機能，本課程將有助於學生對激素整體了解，以培養更深入研究內分泌之能力。

262034 Animal Endocrinology 2 E P. C. Shen F

This course is designed for study the classes of hormones, the mechanisms of hormone action, the control of hypothalamic-hypophyseal hormone and the physiological roles of the endocrine glands (tissues) in domestic animal. After complete this course, students can understand the hormone functions and can learn advance topic easily.

262035 禽畜環境生理學 2 選 謝豪晃 上

本課程主要討論環境因素、氣候條件以及動物的各種生理控制機構；進而探討環境對動物所造成的影響，以及克服的方法；從動物行為、飼養管理以及畜舍設計等方面來提高畜牧生產的效率。台灣地處亞熱帶，每年長達 6~7 個月的時間處在高溫高濕的緊迫環境，如何克服環境緊迫所造成的不良影響，提高畜牧生產，實為一重要課題。

262035 Environmental Physiology of Domestic Animals 2 E H. H. Hsieh F

This course will discuss the environmental factors, climatic conditions and physiological mechanisms of domestic animals, and further investigate the effects of environments on the performance of animals. The important object of this course is to evaluate some methods to overcome the animal production problems due to the warm humid environments in Taiwan.

262036 飼料製造技術 2 選 謝豪晃 上

本課程乃教授禽畜及魚類完全配合飼料製造工業之現代技術，內容包括：單味飼料之生產方式與一般生產過程之影響因素、飼料預混劑之製造技術、配合飼料之製造包括設計、收料、混合、製粒、包裝儲存與糖蜜、油脂等液體原料添加之有關技術、養魚飼料之製造技術等。

262036 Feed Manufacture Technology 2 E H. H. Hsieh F

The objective of this course is to acquaint the students with the modern technique about the formula feed industry of the livestock, poultry and fish. The course contains the processing of the ingredient feed and the influent factors about general processing problems; processing and adding of feed premix; the engineering of formula feed, including design, receiving, grinding, mixing, pelleting, bagging, weighing, loading and the technique of addition of liquid ingredients; and the technique of manufacturing of the fish formula feeds.

262037 飼料製造技術實習 1 選 謝豪晃 上

配合『飼料製造技術』課程之講授內容，作實地之見習與操作，藉予提高該課程之教學效果，內容包括：單味原料製造方法之見習、參觀各單味原料工廠，比較不同生產方法之結果、配合飼料工廠製造技術見習及操作。

262037 Practice of Feed Manufacture Technology 1 E H. H. Hsieh F

In conjunction with the lectures of the course of feed manufacturing technology, students are provided with the opportunity for the exercise and practical operation of the feed manufacturing technology, to enhance the effects of this course. The exercise of the feed manufacturing technology covers observation the processing of the various feed ingredients, visit feed plants to compare the results of different processes of feed ingredient, and explanation and operation of the process on the formula feed manufacturing.

262038 肉用草食家畜飼養管理 2 選 吳錫勳 上

本課程主要討論兔及山羊等草食肉用家畜之飼養管理。內容包括品種特性、營養與飼養、管理與設備、遺傳育種與繁殖技術、疾病防治與產品利用，畜舍規劃與市場經營等主題，並特別強調在本省地區之特殊環境下，如何經由學理與技術之應用，以調適經營及管理方法，提昇生產效率。

262038 Meat-production Ruminant Farm 2 E H. H. Wu F
Animal Feeding and Management

The objective of this course is to give the students more confidence in their abilities for meat-production herbivorous farm animals. The major concepts of this course include: major breeds of rabbits and goats, their characteristics, principles of genetics, nutrition, feeds and feeding, herd and reproductive managements, reproductive techniques, disease control, marketing, and management of products. The topics being put in the priority are those factors and techniques that are capable of being used for improving the efficiency of rabbits and goats production under the adverse environmental conditions.

262039 肉用草食家畜飼養管理實習 1 選 吳錫勳 上

本課程主要提供學生更多肉用草食家畜之飼養管理實習機會。內容包括兔與羊之主要品種特性、營養與飼養、管理與設備、遺傳育種與繁殖技術、疾病防治與產品利用，畜舍規劃與市場經營等主題，並特別強調在本省地區之特殊環境下，如何經由學理與技術之應用，以調適經營及管理方法，提昇生產效率。

262039 Practice of Meat-production 1 E H. H. Wu F
Herbivorous Farm Animals Feeding and Management

The objective of this course is to provide students more practice opportunity for meat-production herbivorous farm animals. The major concepts of this course include: major breeds of rabbits and goats, their characteristics, principles of genetics, nutrition, feeds and feeding, herd and reproductive managements, reproductive techniques, disease control, marketing, and management of products. The topics being put in the priority are those factors and techniques that are capable of being used for improving the efficiency of rabbits and goats production under the adverse environmental conditions.

262040 芻料作物及其調製 2 選 吳錫勳 下

本課程主要在介紹熱帶芻料的生產利用，就土壤、作物和動物生產之相關問題進行探討，包括芻料的生長環境、芻料種類的選擇、性狀、栽培管理（如施肥、雜草防治）、芻料的收穫利用（如青割、乾草、半乾青儲料、青儲料）及草地的維護（如放牧頭數、放牧方式）並就台灣現有芻料的生產利用加以討論，以達學以致用之效果。

262040 Forage Production and Utilization 2 E H. H. Wu S

This course is designed to discuss the production and utilization of forages. The objectives of this course are to offer the relationships among soil, forages and animal production, including: climatic factors in forage production; characters, culture, management (e.g. fertilization, weed control) and utilization of forages (e.g. silage, hay, haylage, silage); management of improved pastures (e.g. stocking rate, systems of grazing management). In addition, topics of forages in Taiwan will also be discussed so that the students will become aware of forage, application for further of livestock production.

262041 飼料分析與品管 2 選 黃自毅 上

本課程之設計主要在介紹正確的分析方法，儀器的正確使用，以減少分析結果之誤差，配合飼料所需單位原料之品質檢查方法及配合飼料製造流程之品管現代技術，內容包括：飼料分析的基本操作、飼料分析的方法、原理和應用、單位原料之品質管理、配合飼料之品質管理、添加物之品質管理、飼料製造之品質管理。

262041 Feed Analysis and Quality Control 2 E T.Y.Huang F

This practice course is in associate with the course of feed analysis and quality control to provide the training to students on this technique. The contents include the safety of laboratory, sampling and basic operation of analysis, the methods that may be employed for the detection and determination of feeds, quality control of feedstuffs, and quality control of

feeds plants in manufactured processing.

262042 飼料分析與品管實習 1 選 黃自毅 上

本實習內容主要是配合「飼料分析與品管技術」課程，使學生實際進行所需要之操作訓練；其內容包括：實驗室的安全認識、採樣及分析基本訓練、飼料各項分析的分析方法及操作、各種飼料原料之品質鑑定、飼料原料摻雜物之檢出。

262042 Practice of Feed Analysis and Quality Control 1 E T.Y.Huang F

This practice course is in associate with the course of feed analysis and quality control to provide the training to students on this technique. The contents include the safety of laboratory, sampling and basic operation of analysis, the methods that may be employed for the detection and determination of feeds, quality control of feedstuffs, and quality control of feeds plants in manufactured processing.

262043 禽畜副產物利用 2 選 陳志銘 下

本課程之主要內容包含：禽畜副產物之種類、生產量、價值與特性，腸衣、脂肪、明膠、血液、毛皮及羽毛、乳品副產物及蛋品副產物等之處理與應用，及禽畜副產物在食品加工、工業與醫學上之應用

262043 Utilization of Animal and Poultry 2 E C. M. Chen S

The major contents in this course include kinds, production quantity, values, and characteristics of animal and poultry byproducts. In addition, many byproducts, including casing, lipids, gelatin, blood, father, dairy, and egg byproducts will also be addressed. Finally, uses of these byproducts in food processing, industries, and medical application will also be included.

262044 蛋品加工 2 選 黃自毅 下

本課程介紹蛋品加工有關技術之學理與所使用設備的原理。重點將著重於使學生瞭解各種加工技術，包括蛋品之濃縮、蒸煮、乾燥、酸鹼值改變、添加物使用與蛋品保存等之原理與應用。

262044 Processing of Egg Products 2 E T. Y. Huang S

This course introduces technologies related to egg processing and principles of the equipments and facilities related. The purpose of this course is educating students with knowledge include condensation, steam cooking, drying, pH adjustment, food additives addition, egg product preservation, and etc.

262045 蛋品加工實習 1 選 黃自毅 下

本課程配合蛋品加工技術之正課，使得學生能在瞭解蛋品加工技術有關之原理及設備的功能外，更能實際正確地操作各項設備，以製作各項產品，包括：皮蛋、鹹蛋、蒸蛋、三色蛋、長蛋、滷蛋、焗蛋等。

262045 Practice of Egg Products 21 E T. Y. Huang S

In this course, it educates students how to handling the egg processing equipments correctly. Moreover, students will apply these equipments to produce several egg products, including preserved eggs, salty eggs, steaming eggs, three-colored eggs, long eggs and other egg products.

262046 單胃動物營養與飼料 2 選 謝豪晃 上

本課程係針對單胃動物之營養需要，給予飼料之種類，及特性作較深入之闡述，其內容包括：肉豬各生長階段之營養需要、種豬之營養需要、養豬飼料之種類及特性、馬不同用途之營養需要、馬飼料之特性。

262046 Monogastric Animal Nutrition and Feed 2 E H. H. Hsieh F

The object of this course is to give the students more deep descriptions on the nutrition requirements and feed kinds and characteristics of the monogastric animals. The course includes the nutrition requirements for swine in different growing stage, the nutrition requirements for the sow and boar, the kinds and characteristics of swine feed, the nutrition

requirements for the horses of different uses, and the kinds and characteristics of horses.

262047 乳品加工 2 選 林美貞 上

本課程講授乳之種類及成分、原料乳之品質、原料配合、加工原理、加工製程、品質管制及貯藏。乳製品種類包涵鮮乳、調味乳、乳粉、煉乳、發酵乳、冰淇淋、乾酪、乳酪及乳油。

262047 Processing of Dairy Products 2 E M. J. Lin F

This course includes milk compositions, raw material quality, raw material recipes of dairy products, chemical changes of processing, processing scheme, quality control and storage. Major dairy products such as fresh milk, flavored milk, milk powder, concentrated milk, fermented milk, ice cream, cheese, butter and cream will be included.

262048 乳品加工實習 1 選 林美貞 上

本實習配合乳品技術之課程，使學生熟悉乳品之製程及品質控制。內容包括生乳及鮮乳檢驗、乳成分及微生物檢驗、鮮乳及調味乳製造、發酵乳製造、冰淇淋製造及乾酪製造。

262048 Practice of Dairy Products 1 E M. J. Lin F

The objective of this course is to give students practical training on formula, processing and quality control of dairy products. It includes chemical, physical and microbial examinations of raw milk and dairy products, manufactures of fresh milk, flavored milk, fermented milk, ice cream and cheese.

262049 畜產品品質管理技術 2 選 陳志銘 上

本課程探討生產安全性畜產品之技術，使學生能在日後生產安全性畜產品時，能應用所學相關知識。主要課程內容包括：安全性飼料生產、動物飼養管理、防疫監測、安全性加工生產及抗生素殘留檢測分析。

262049 Quality Control and Techniques in 2 E C. M. Chen F
Animal Products Management

The arrangement of this course is to let the student understand the technique about safe animal production. Specific topics including the safe feed manufacturing, feed additives, animal feeding and management, diseases control, safe animal products processing, and antibiotic residues analysis.

262050 水禽飼養管理 2 選 黃自毅 上

本課程在使學生瞭解水禽的飼養管理，課程內容包括：水禽簡介、鴨及鵝的特性與習性、水禽的品種、鴨及鵝的捕捉與固定法、種禽的選擇與配種、鴨及鵝的雌雄鑑別法、種用水禽的房舍、飼養及管理、種蛋的管理及保存、鴨蛋及鵝蛋的孵化法、肉用鴨、鵝的生產，水禽產品的處理。

262050 Waterfowl Feeding and Management 2 E T. Y. Huang F

An advanced study of waterfowl production that includes introduction to waterfowl, their peculiarities and habits, breeds, handling and holding of waterfowl, selection of breeders and management of the breeds, caring and holding of hatching eggs, incubation of duck and geese egg, production of market ducks and geese, the processing of waterfowl etc.

262051 兔學 2 選 劉炳燦 上

本課程之討論範圍包括兔的生物學及各品種特性，營養與飼養，管理與設備，遺傳育種與繁殖技術，疾病防治與產品利用，兔舍規劃與市場經營等主題，並特別強調在本省地區之特殊環境下，如何經由學理與技術之應用，以調適經營及管理方法，提昇生產效率。

262051 Rabbit Science 2 E B. T. Liu F

The objective of this course is to give the students more confidence in their abilities for producing rabbits, managing and improving rabbit industry. Dealing with the modern concepts in rabbit science, it comprises the following subjects: biology of the rabbits; major breeds of the domestic rabbit and their characteristics; principles of rabbit genetics, nutrition,

feeds and feeding; herd and reproductive managements; reproductive techniques; disease control; preparation of rabbit meat, fur and wool; marketing the rabbit products; and so on. The topics being put in the priority are those factors and techniques that are capable of being used for improving the efficiency of rabbit production under the adverse environmental conditions.

262052 肉品加工 2 選 陳志銘 下

本課程介紹肉品加工有關技術之學理與所使用設備的原理。重點將著重於使學生瞭解各種加工技術，包括肉品之醃漬、嫩化、煙燻、乳化、乾燥、添加物使用與肉品保存等之原理與應用。

262052 Meat Products Processing 2 E C.M. Chen S

This course introduces technologies related to meat processing and principles of the equipments and facilities related. The purpose of this course is educating students with knowledge include meat marination, tenderization, smoking, emulsion, drying, food additives addition, meat product preservation, and etc.

262053 肉品加工實習 1 選 陳志銘 下

本課程配合肉品加工技術之正課，使得學生能在瞭解肉品加工技術有關之原理及設備的功能外，更能實際正確地操作各項設備，以製作各項產品，包括：醃漬肉排、香腸、火腿、臘肉、貢丸、叉燒、油雞等。

262053 Practice of Meat Products Processing 1 E C.M. Chen S

In this course, it educates students how to handling the meat processing equipments correctly. Moreover, students will apply these equipments to produce several meat products, including marinated chops, sausages, hams, Chinese bacon, Chinese meatball, BBQ pork, poultry products.

262054 反芻動物營養與飼料 2 選 吳錫勳 上

本課程之設計在討論反芻動物營養與飼料之特性和應用。內容包括瘤胃的環境，各種養分如碳水化合物、蛋白質和脂質在瘤胃的發酵，與胃腸道有關的營養性問題，進而討論反芻動物營養需要量，飼料之類別及日糧之平衡。

262054 Ruminant Nutrition and Feeds 2 E H. H. Wu F

This course is designed to discuss the characteristics and application of ruminant animal nutrition and feeds. The contents include : rumen environment; carbohydrate, protein and lipid fermentation in rumen; nutritional problems related to the gastro-intestinal tract; nutrient requirement of ruminant animal; classification of feeds and balance of ration.

262055 飼料配方設計 2 選 謝豪晃 下

本課程係傳授各種禽畜飼料添加物及飼料配方之最新設計技術，其內容包括：飼料添加物之種類、特性及用途、飼料配方之設計原理與設計方法、養豬飼料配方之設計、養雞飼料配方之設計、反芻動物飼料配方之設計、其他飼料配方之設計。

262055 Design of Feed Formulation 2 E H. H. Hsieh S

The object of this course is to acquaint the students with feed additives and the modern design technique of feed formulation for the livestock and poultry. The contents of this course are the kind and using of the feed additives, principle and method of designing feed formulations, design of swine feed formulation, design of poultry feed formulation, design of ruminants feed formulation, and design of the other animal feed formulation.

262056 鹿學 2 選 劉炳燦 下

本課程之討論範圍包括鹿的生物學及台灣現有鹿種之特性，營養與飼養，管理與設備，繁殖管理，疾病防治與產品利用，鹿舍規劃與市場經營，並特別強調在台灣之特殊環境下，如何經由學理與技術之應用，以調適經營及管理方法，提昇生產效率。

262056 Deer Science 2 E B. T. Liu S

The objective of this course is to give the students more confidence in their abilities for producing domestic deer, managing and improving deer industry. Dealing with the modern concepts in deer science, it comprises the following subjects: biology of the cervides; major breeds of the native cervides and their characteristics; principles of cervides genetics, nutrition, feeds and feeding; herd and reproductive managements; deer farm planning; disease control; preparation and marketing of the deer products, and so on. The topics being put in the priority are those factors and techniques that are capable of being used for improving the efficiency of deer production under the native conditions.

262057 畜產與氣候變遷 2 選 林美貞等 下

本課程旨在探討面對氣候暖化造成的全球氣候異常現象，畜牧生產目前與未來面臨的挑戰。將分別由育種、營養、生理及畜產品利用等四大領域教師，進行因應氣候變遷之畜產相關產業發展方向、畜產技術開發及應用、畜產經營規劃及理念、及畜產界應具有之社會責任等相關議題的探討。本課程將由各種因氣候變遷造成之議題，引導高年級學生應用所學專業知識，培養具有收集資料、分析資料、討論之能力。

262057 Animal Industry and Climate Change 2 E M. J. Lin et al. S

This course focuses on the challenges to animal production industry by the climate change caused by global warming. There will be teachers from the fields of breeding, nutrition, physiology, and products utilization co-teaching this complicated subject and exploring problems as well as opportunities. We will cover the issues related to future development, new technology, and farm management of animal industry, so as the social responsibility. Senior students will apply knowledge they have learned and practice the ability of collecting data, analyzing information, and discussing topics which are related to the future of animal industry.

262058 畜產品在美容之應用 2 選 林美貞 下

本課程講授畜產品的特性及於美容產業之應用。課程內容包括美容產業及美容產品之介紹、畜產原料及成分之特性、乳於美容產業之應用、各種畜產副產物原料及成分之特性、特殊成分之萃取與純化、畜產副產物於美容產業之應用及相關法規。

262058 Application of Animal Products on Beauty Industry 2 E M. J. Lin S

This course includes properties of animal products and their application in beauty industry. The content of this course includes the introduction of beauty industry, properties of animal products and ingredients, application of milk on beauty products, properties of animal by-products, extraction and purification of special ingredients, application of animal by-products ingredients, and related regulation.

262059 伴侶動物飼養管理 2 選 余祺 上

本課程之授課內容包括：伴侶動物種類來源、品種、繁殖與育種、營養、飼養與管理、畜舍和保定，以及保健。本課程所提供飼養寵物之相關常識，將有助於寵物飼養技術之提升。

262059 Companion Animals Feeding and Management 2 E C. Yu F

The purpose of this course provides the necessary information including origins, breeds, reproduction and breeding, nutrition, feeding and management, housing and handling, health care in companion animals. It is hoped that this study will serve as a guide for advanced in the field of companion management.

262060 禽畜廢棄物管理 2 選 翁瑞奇 上

本課程旨在協助學生熟悉畜牧廢棄物之特性，一般廢棄物處理技術與原理，三段式廢水處理場之設計及各種禽畜污染防治技術，堆肥原理與製作，脫臭原理與技術，污染之減量及處理，以達到環保法規之要求標準，方能永續發展。

262060 Poultry and Livestock Waste 2 E R. C. Weng F

Management

The purpose of this course is to assist the students to understand the characteristics of animal waste, the general principles and techniques of treatment, the design of wastewater treatment plant, composting treatment, odor control and sludge minimization in order to achieve the EPA required standards.

262061 畜產經營學 2 選 下

使學生瞭解經營牧場之一般原則、原理與如何應用經濟原則及牧場經營有關業務期降低經營成本，提高利益，其內容包括牧場生產資源之利用、牧場經營之經濟原則、禽畜生產預估、畜產品運銷、生產業務之配合利用、牧場建築與設備、環境污染控制、以及自動化生產的方式評估。

262061 Livestock Production Management 2 E S

To allow students to understand the general principles of managing animal production, and to know to apply the economic theories into the animal production with a view to decreasing production costs and increasing profits. This course is dealing with the utilization of animal production resources, the estimating of animal production, the marketing of animal products, the coordination of production business, the farm building and equipment and the control of environmental pollution.

262062 休閒畜牧實務技術 2 選 黃自毅 下

本課程目的在讓學生了解休閒牧場的規劃和經營管理實務。內容包括：1.休閒牧場的規劃 2.生產管理 3.行銷管理 4.人力資源管理 5.財務管理 6.教育宣導 7.民宿經營 8.農牧場餐飲管理 9.環境管理 10.安全管理 11.經營診斷 12.觀摩休閒牧場實務。

262062 Leisure Animal Farm Management 2 E T.Y. Huang S

The purpose of this course is to let students understand the planning and management of leisure animal farm. The contents include: 1. The planning of leisure animal farm; 2. Production management; 3. Marketing management; 4. Human resource management; 5. Financial management; 6. Education; 7. Housing management; 8. Restaurant management; 9. Environmental management; 10. Safety management; 11. Managerial diagnosis; 12. Visiting leisure farms.

262063 加工廠經營管理導論 2 選 陳志銘 上

本課程主要討論食品加工廠經營管理的基本意義、目的與策略。主要內容包括：生產管理、物料管理、品質管理、行銷管理、財務管理、人事管理、危機與客訴管理及衛生安全管理等。

262063 Introduction to Food Processing Plant Management 2 E C.M. Chen F

This course will discuss the meaning, purpose and strategy of food processing plants. The major chapter contents processing management, materials management, quality management, marketing management, financial management, personnel management, and etc.

262064 屠體分切與應用 2 選 林美貞 下

本課程內容以豬、牛、雞屠體部位及應用為主，將依台、美、日等國屠體與食肉等級評定的標準及方法進行屠體評級，以判定屠體之組成與價值。進而介紹屠體分切之標準及技術，以解說不同部位肉之品質，及其品質判定方法與標準。依據食肉可口性與產量，說明屠體與部位肉之等級評定，並且討論各部位肉於中式加工品與西式料理之應用。

262064 Carcass Cutting and Application of Meat Parts 2 E M. J. Lin S

This course focuses on the cutting of pork, beef cattle, and chicken carcasses as well as the application of parts of carcass. The carcass evaluation and cutting standards will be introduced according to Taiwanese, American, and Japanese regulations. We will introduce how to classify the meat at various parts of carcass by quality parameters. The best use of

meat on Chinese meat products and Western cuisines will be discussed.

202065 農業財務概論

3 選

潘璟靜

下

本課程為建立本系學生之農企業財務相關基礎及概念，主要為了解帳務處理、財務報表分析與財務規劃。帳務處理包括會計基本概念、借貸法則與會計記錄、調整與編表。財務報表分析包括財務比率、財務比率分析與應用。財務規劃則涵蓋貨幣時間價值、淨現值、資本預算分析與營運資金管理。

202065 Introduction of Agricultural Finance

3

E

G. G. Pan

S

This course is to establish the basis and concept of agricultural finance, including accounting for business transactions, analysis of financial statements, and financial planning. Accounting for business transactions includes fundamental concepts of accounting, the rules of debit and credit, recording transactions, the adjusting process, and preparing the financial statements. Analysis of financial statements includes financial ratios, ratios analysis and applications. Finally, financial planning includes time value of money, net present values, capital budgeting, and working capital management.

四年制 先進材料學士學位學程

(一)教育目標

- 1.培育學生具備材料專業工程師與領導人才之能力
- 2.培育學生具備思考分析與溝通整合之能力
- 3.培育學生具備團隊合作與職場倫理
- 4.培育學生參與國際交流與社會關懷工作

(二)校定共同必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
通識課程 General Education	12	2	2	2	2	2	2			通識選項課程： 人文學科：2 門 社會科學：3 門 自然與生命科學：1 門
國文 Chinese	4	2	2							國文(閱讀與寫作)(1) 國文(閱讀與寫作)(2)
大一英文 Freshman English	4	2	2							大一英文(1) 大一英文(2)
英語聽講練習 101~102 English Listening & Speaking Practice	2	1	1							英語聽講練習 101 英語聽講練習 102
憲法 Constitution	2			2						
體育 Physical Education	4	1	1	1	1					一年級： 大一體育(1)、 大一體育(2) 二年級： 體育選項(需修讀不同 興趣體育課程)
生活服務教育 Student Life Service Education	0	0	0							
通識教育講座 Lectures on General Education	1				1					各系依序開課，開 課學期不定
外語實務 Foreign Language Proficiency Test	0	0								畢業前修畢 通過標準依「外語 實務課程實施要 點」規定
合 計	29	8	8	5	4	2	2	0	0	

(三) 學院共同必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
普通物理學(1) General Physics(1)	3	3								
普通物理學實驗(1) General Physics Lab.(1)	1	1								
普通化學(1) General Chemistry(1)	3		3							
普通化學實驗(1) General Chemistry Lab.(1)	1		1							
微積分(1) Calculus (1)	3		3							
實務專題 Special Projects	2						1	1		
工程倫理與法規 Ethics and Law in Engineering	1						1			
合 計	14	4	7	0	0	0	2	1	0	

(四)專業必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
材料科學導論 Introduction to Materials Science and Engineering	3		3							21693
材料實驗(1) Fundamental Experiments in Materials(I)	1			1						21920
材料熱力學(1) Thermodynamics of Materials(1)	3			3						21683
工程數學 Engineering Mathematics	3			3						21736
金屬材料 Metallic Materials	3			3						30103
近代物理 Concepts of Modern Physics	3			3						20445
材料實驗(2) Fundamental Experiments in Materials(II)	1				1					21684
物理冶金(1) Physical Metallurgy(1)	3				3					21680
陶瓷材料 Ceramic Materials	3				3					21692
有機化學 Organic Chemistry	3				3					20293
材料熱力學(2) Thermodynamics of Materials(2)	3				3					21878
高分子材料 Polymer Materials	3					3				20643
材料實務專題 Practice of Material Topics	1					1				
物理冶金(2) Physical Metallurgy(2)	3					3				21879
材料分析 Materials Analysis	3					3				21690
X 光晶體繞射學導論 X-ray Diffraction	3						3			
電子顯微學 Electron Microscopy	3						3			
工廠管理 Factory Management	3						3			21290

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
校外實習 Internship	3							3		20584
合 計	51	0	3	13	13	10	9	3	0	

(五)專業選修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
材料工程概論 Introduction to Materials Engineering	3	3								20341
電腦繪圖 Computer Drafting	3		3							21546
普通物理學(2) General Physics (2)	3		3							20777
普通物理學實驗(2) General Physics Lab. (2)	1		1							20778
專利檢索與分析 Patent Survey and Analysis	3			3						20695
電化學 Electrochemistry	3			3						
科技英文實務 Proficiency in Technology English	2			2						
材料化學 Material chemistry	3				3					
固態物理導論 Solid State Physics	3				3					
電磁學 Electromagnetics	3				3					
非破壞檢測 Nondestructive Testing	3				3					20451
金屬熱處理 Heat Treatment of Metals	3				3					
機械冶金 Machine metallurgy	3					3				
金屬腐蝕與防蝕 Corrosion & Protection of Metals	3					3				
半導體製程導論 Introduction to Semiconductor	3					3				21780
電子材料 Electronics Materials	3					3				20996
電工學 Electrical Engineering	3					3				55065
生醫材料 Introduction to Biomaterials	3					3				21880
計算材料學與實務 Computational Materials Science and Practice	3					3				

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
電子構裝技術概論 Electronics Packaging	3								3	
材料接合技術 Materials Joining Technology	3								3	30078
合 計	119	3	7	8	15	21	20	30	15	

先進材料學士學位學程

中英文課程綱要

[專業必修]

21693 材料科學導論 Fundametal Experiments Science and Engineering(I)

大一，2，必，3 學分

本課程主要針對各種材料（金屬、陶瓷、高分子、複合材料）之基本原理，性質及應用，做概要性的介紹。內容包括材料之晶體結構與晶體缺陷，固體材料之原子擴散，相圖與相變化，材料製程及應用，材料之物理性質（光性質、電性質、磁性質及熱性質），材料之機械性質（強度、延展性、硬度、韌性、疲勞、潛變），材料之強化機構與方法。

This course is directed against various kinds of materials mainly (The metal, ceramic, polymer, composite) Basic principle, Nature and application, do the outline introduction. The content includes the crystal structure of the material and crystal defect, the atom diffusion of the solid material, phase picture and phase change, the process and application of material, physical property of material (light nature, electric nature, magnetic quality and hot nature), mechanical nature of the material (The intensity, ductility, hardness, toughness, fatigue, creep), Strength mechanism and method of the material.

21920 材料實驗(I) Fundametal Experiments in materials(I)

大二，1，必，1 學分

在使材料本科同學，對於各種相關的材料實驗及技巧有基本的認識。(技職網填報時要求需滿足 50 字以上)

Classmates of material undergraduate course that making, have basic understanding to various kinds of relevant material experiments and skills

21683 材料熱力學(1) Thermodynamics of Materials(1)

大二，1，必，3 學分

將熱力學定律應用於計算凝結相之化學位能與其平衡，逸壓和活性因素，溶液熱力學，多元金屬溶液，相圖和相變化，運用電腦模擬相反應和相圖，及研擬冶金數學模式。

It applies the theory of thermodynamics to calculate chemical potential energy and its equilibrium of condensed phase, released pressure and activated factors, solution thermodynamics, complex metal solution, phase diagram and phase change, computer-aided phase reaction and phase diagram simulation, and planning a mathematics model of metallurgy.

21736 工程數學 Engineering Mathematics

大二，1，必，3 學分

本課程主要目標在介紹與實際問題相關之數學領域，以模擬解題及詮釋等方式，將數學方法應用在工程問題上。課程內容有常微分方程，線性代數，向量微積分，Fourier 分析及偏微分方程式等章節，訓練同學在理論，計算及實驗間建立正確的認知及意義。內容將繼續介紹複數分析及數值方法等章節，尤其對計算機的概念及演算法乃給予較多的強調，對實際問題亦有簡化討論。另外，在應用解決問題構想，練習例題及理論間，更有相輔相成的效果。至於線性規化，圖形組合，機率理論及數學機率等內容亦有概略介紹，務使同學有正確的認知。

The course's main target is to introduce math region which is relating to practical questions with simulate solution and interpretation, it applies the math method to engineering questions. The course content includes ordinary differential equation, linear algebra, vector calculus, Fourier analysis and partial differential equation partial differential equation, with the aim to train students in establishing an exact perception to the meaning of theory, calculation and experimentation. it also introduces complex number analysis and numeric method, especially put more emphasis at the computer concept and algorithm, a simplified discussion to the practical problem as well. Besides, it has a mutual supporting effect in solving question concepts, practising model question and theory. As to the linear programming, graphs and combinatorial optimization, probability theory and mathematical probability, this course also has a brief introduction, its target is to let all the students

30103 金屬材料 Metallic Materials

大二，1，必，3 學分

材料之特性取決於材料內部組織，所以課程內容也注重內部組織與材料特性之間的關係，內部組織的變化對材料特性之影響，由理論為基礎之探討至實際之應用上。對本課程有關的基本概念，則詳加說明，初學材料者能得到材料上所必備之基本知識，若基本概念已有充分了解，則利用這些知識即可參考材料規格或手冊就可得到欲知之條件，進而以此概念作基礎，亦可研習更高深之學問，本課程內容著重於介紹材料之結構，基本原理有：1. 金屬之基本理論，金屬及合金之構造，材料之組織，塑性加工變形之理論，材料之物理化學，機械性質及其實驗。2. 鋼和鐵之製造，組織及其熱處理，變態理論。3. 構造用鋼，合金鋼，工具鋼，特殊鋼之特性、用途及其熱處理方法。4. 鋼之表面硬化理論及其熱處理方法。5. 鑄鐵之冶煉，種類及其熱處理方法。6. 非鐵金屬材料，銅，鋁，鈦，鎂，錫，鋅，鉛，鎳等合金種類之特性及其處理方法。

The characteristics of material depend on the inside tissue, therefore, the content also put more emphasis on the relationship between the inside tissue and material characteristics, how the change of inside tissue influences it in full details from the discussion of the theory basis to practical application. It has a detail description to the basic idea of this course, the novice may get requisite

fundamental knowledge. Once they fully perceive these basic ideas, they may refer to material specification or manual to get the conditions they request, or they may use these foundation to further explore advanced knowledge.

20445 近代物理 Concepts of Modern Physics

大二，1，必，3 學分

二十世紀初開始的物理學基礎理論體系的重大變革—近代物理學的誕生是自然科學的一個革命性飛躍。以相對論，量子理論為先導，形成高能物理學，核物理學，低溫物理學，凝聚態物理學，鐳射物理學等學科，促成了核裂變，核融合，半導體，晶體管，鐳射器等重大科技成果的出現，形成諸多影響人類社會生產力的高新產業，它改變了物理學乃至自然科學的面貌，掀開了人類自然觀和科學觀的新的一頁。在近代材料科學上，人們認識到是物質巨視性質的任何突破都是以對其微視架構及規律的認識的突破為前提。因而，從事材料科學理論和應用專業的學生必須具有高能，微視領域的基礎理論知識，才能在後繼課程的學習中有所斬獲，在今後的工作中有所創造。

Great change of the basic theoretical system of physics begun at the beginning of the 20th century – The birth of modern physics is a revolutionary leap of the natural science. With Theory of Relativity, the quantum theory is the guide, form high-energy physics, nuclear physics, low temperature physics, condense attitude physics, such disciplines as laser physics, etc., have facilitated nuclear fission, nuclear fusion, the appearances of such great scientific and technical results as the semiconductor, the transistor, the laser instrument, etc., orming the high-new industry of the productivity of human society of a great deal of influence, it has changed the appearances of physics and even natural science, have raised mankind's natural view and a new chapter of the scientific view. On modern material science, people realize any break-through that is the macroscopical nature of material is to regard break-through of the understanding of its micro structure and law as the prerequisite. Therefore, are engaged in the material scientific theory and use specialized students to have high energy, the basic theory knowledge of the micro field, could reap to some extent in the study of course of carrying on, create to some extent in future work

21684 材料實驗(2) Fundametal Experiments in Materials(2)

大二，2，必，1 學分

在使材料本科同學，對於各種相關的材料實驗及技巧有基本的認識(技職網填報時要求需滿足 50 字以上)

Classmates of material undergraduate course that making, have basic understanding to various kinds of relevant material experiments and skills.

20680 物理冶金(1) Physics Metallurgy(1)

大二，2，必，3 學分

材料科學為工程教育的重要科技，材料的性質與特性，為現代工程設計中佔有相當重要的地位，金屬材料的各種性質，都基於其內部構造的變化，其內部原子聚集成規則的結晶構造，亦或聚集成非結晶構造，其所形成的各種物理特性，由最基本的結晶構造開始了解。電子顯微鏡，破壞力學，超導性，電傳導，超塑性，動態回復，動態時效應變。差排理論、結晶核的形成與成長，合金相理論，晶界自由度，鑄造物的成核與均質化，硬化現象，固體擴散現象，破壞現象及理論，潛變的形成與原因等，充分了解金屬材料特性上的理論基礎與變化軌跡。

Properties and characteristics of materials play important role in modern engineering design. Each property of materials is based on its transformation at inner structure, its atoms inside converge either a regulated crystal structure or a noncrystal structure, their physical property should be understood from the most fundamental crystalline structure, such as electronic microscope, destructive dynamics, super-conductivity, electronic conductivity, super-plasticity, dynamic recovery, dynamic aging strain, dislocation theory, the formation and growth of crystalline nucleus, alloy phase theory, crystal boundary free degree, nucleus and homogenization of casting product, hardening phenomenon, solid diffusion phenomenon, destructive phenomenon and theory, creep formation and its reason, all of these make student fully understand the theory basis and change record of the metallic material characteristics.

21692 陶瓷材料 Ceramic Materials

大二，2，必，3 學分

本課程以訓練學生對陶瓷材料性質認識，並進而介紹陶瓷材料基本製程。課程重點在陶瓷粉體製備成形方法，燒結及燒結理論，除加強學生認識傳統陶瓷外，並對結構陶瓷與電子陶瓷之應用，作有系統的介紹。

This course aims at training the knowledge of ceramics materials and to introduce the basic manufacturing process of ceramics materials. The focus of this course is the formation method of ceramics powder, sintering and sintering theory. Except for strengthening the perception of traditional ceramics, it also has a systematic introduction to the application of structural ceramics and electronic ceramics.

20293 有機化學 Organic Chemistry

大二，2，必，3 學分

介紹有機化學原理及應用於材料科學之場合 (技職網填報時要求需滿足 50 字以上)

introduction to organic chemistry of materials

21878 材料熱力學(2) Thermodynamics of Materials(2)

大二，2，必，3 學分

將熱力學定律應用於計算凝結相之化學位能與其平衡，逸壓和活性因素，溶液熱力學，多元金屬溶液，相圖和相變化，運用電腦模擬相反應和相圖，及研擬冶金數學模式。

It applies the theory of thermodynamics to calculate chemical potential energy

and its equilibrium of condensed phase, released pressure and activated factors, solution thermodynamics, complex metal solution, phase diagram and phase change, computer-aided phase reaction and phase diagram simulation, and planning a mathematics model of metallurgy.

20643 高分子材料 Introduction of Material Topics

大三，1，必，3 學分

1. 高分子結構及其物理性質 2. 高分子定性與分析 3. 高分子流變學 4. 高分子複合材料(技職網填報時要求需滿足 50 字以上)

1. Polymeric Structure and its Properties 2. Characterization and Analysis of Polymers 3. Rheology of Polymers 4. Polymeric Composite Materials

材料實務專題 Practice of material topics

大三，1，必，1 學分

所有學生在研究課題內容之前，必須先學習相關的材料文件，通過實驗路線，實驗測量操作和結果分析，從課程寫作的科學論文，學生將能夠在整體方面進行單獨的培訓 思考和解決問題能力。

All the students must study related material documents before they research the subject-matter content, through scheming experimental route, experimental measurement operation and results analyses, scientific papers writing from the courses, students will be able to exercises in overall aspects to be trained up individually thinking and solving problem abilities.

21879 物理冶金(2) Physics Metallurgy(2)

大三，1，必，3 學分

材料科學為工程教育的重要科技，材料的性質與特性，為現代工程設計中佔有相當重要的地位，金屬材料的各種性質，都基於其內部構造的變化，其內部原子聚集成規則的結晶構造，亦或聚集成非結晶構造，其所形成的各種物理特性，由最基本的結晶構造開始了解。電子顯微鏡，破壞力學，超導性，電傳導，超塑性，動態回復，動態時效應變。差排理論、結晶核的形成與成長，合金相理論，晶界自由度，鑄造物的成核與均質化，硬化現象，固體擴散現象，破壞現象及理論，潛變的形成與原因等，充分了解金屬材料特性上的理論基礎與變化軌跡。

Properties and characteristics of materials play important role in modern engineering design. Each property of materials is based on its transformation at inner structure, its atoms inside converge either a regulated crystal structure or a noncrystal structure, their physical property should be understood from the most fundamental crystalline structure, such as electronic microscope, destructive dynamics, super-conductivity, electronic conductivity, super-plasticity, dynamic recovery, dynamic aging strain, dislocation theory, the formation and growth of crystalline nucleus, alloy phase theory, crystal

boundary free degree, nucleus and homogenization of casting product, hardening phenomenon, solid diffusion phenomenon, destructive phenomenon and theory, creep formation and its reason, all of these make student fully understand the theory basis and change record of the metallic material characteristics.

21690 材料分析 Materials Analysis

大三，1，必，3 學分

1. X-ray 微觀分析。
2. 掃描式電子顯微鏡。
3. 穿透式電子顯微鏡。
4. 表面分析法。(技職網填報時要求需滿足 50 字以上)

1. X-ray Microanalysis. 2. Scanning Electron Microscopy.
3. Transmission Electron Microscopy. 4. Methods of Surface analysis.

X 光晶體繞射學導論 X-ray Diffraction

大三，2，必，3 學分

本課程主要的目的是建立學生將來可以以 X 光作為研究工具的能力。本課程主要可分成四部份：一是結晶學原理、二是 X 光繞射的原理、三是 X 光繞射的基本應用、四是材料的結構分析。本課程包括：X-Ray 特性、晶體與倒晶格、X-Ray 繞射原理、實驗方法、a. Laue 法 b. Powder 法 c. Diffractometer and Spectrometer 量測、單晶與多晶量測、晶體結構鑑定、化學分析、實例分析。

Topics covered include properties of X-rays, geometry of crystals, directions of diffracted Beams, intensity of diffracted beams, orientation and quality of single crystals, structure of polycrystalline aggregates, determinations of crystal structure, phase diagram determination, and Experiments. The contents include Properties of X-Ray、Crystallography and Reciprocal Lattice、Principles of X-Ray Diffraction、Experimental Methods、a. Laue Photographs b. Powder Photographs c. Diffractometer and Spectrometer Measurements、Orientation and Quality of Single Crystal、Structure of Polycrystalline Aggregates、Determine of Crystal Structure、Chemical Analysis by X-Ray Diffraction、Case Studies.

電子顯微學 Electron Microscopy

大三，2，必，3 學分

本課程讓學生了解掃描式電子顯微鏡及成分分析之原理及其應用，並安排示範操作及實作訓練課程，讓學生充分了解各項設備的功能，進而深刻認識並用於其研究工作。授課內容為顯微鏡之結構及其原理、X 射線之原理及應用與機台操作。

The aim of this course is to acquaint the students with the principles of scanning electron microscopy (SEM) and energy dispersive X-ray spectrometer (EDS). The course also arranges the practical sessions to the students in order to fully understand the functions in our system. The students can make use of the system on their research in the future. This course includes the principle and structure of SEM, qualitative X-ray analysis and practical operating in our equipment.

21290 工廠管理 Factory Management

大三，2，必，3 學分

本課程規劃在讓學生了解工廠的作業流程、產品管理、組織管理、資材管理等。工廠管理即是其中一項重要的基礎管理工作。工廠乃是產品的製造場所，所謂工廠管理即將勞動力、土地、資本、原材料等各種有效資源導入製造場所，憑藉計劃、組織、人事、指導、控制等活動，使工廠能夠有計劃、按步驟地如期達成生產目標。使學生能充份了解產業實際管理面與應用面。授課內容包括工廠組織、工廠佈置、物料搬運、產品研發、資材管理與品質管理。授課內容包括工廠管理導論、工廠組織、工廠佈置、物料搬運、產品研發資材管理、品質管理。

The aim of this course unit is to acquaint the students with the know-how of factory management. The course also introduces to the students the organization management, factory layout, finished-good moving, products development and quality management. With the background, a course section on quality management topic is presented. It is hoped that it will be very useful to students who have to learn about the essential area of this management know-how. The content includes fundamentals of factory management, organization management, quality management and product management. The contents include Factory management introduction、Factory organization、Factory layout、Finished-good moving、Product development、Raw material management、Quality management.

校外實習 Internship

大四，1，3 學分

本課程將提供給材料學生到校外材料相關產業公司廠商實習機會，實際接觸或參與各相關產業的產品設計、分析、測試、製造與生產等實務，以增加學生實務能力與知識。

(缺英文課綱)

[專業選修]

20341 材料工程概論 Introduction to Materials Engineering

大一，1，選，3 學分

材料工程概論為材料科學工程之入門課程之一，本課程為期一學期，課程內容廣泛介紹材料相關之基本常識、材料分配及其使用狀況，目的在培養學生材料領域專業知識之完整概念。課程包含材料的鍵結、晶體構造、顯微結構、材料缺陷、材料相變化等基本性質介紹。課程內容中並包括金屬、陶瓷、半導體等材料的特性介紹。

In this one term course, the course of “Basic principles and fundamental tools of Materials Science & Engineering” includes the introduction of atoms bonding, crystal structure, materials microstructure, defect, and phase transformation, and their influences to the physical properties of materials. The course also includes the introductory and manufacturing process of metal, ceramics, and semiconductor materials.

21546 電腦繪圖 Computer Drafting

大一，2，選，3 學分

本課程使學生熟悉機械工程製圖之正確繪圖方法以及電腦輔助機械製圖軟體之使用。培養學生識圖能力，並能應用投影原理，以 AutoCAD 或 SolidWorks 軟體繪製機械工作圖，並使學生瞭解電腦繪圖的觀念與技巧，養成電腦輔助繪圖的實務應用能力。

(缺英文課綱)

20777 普通物理學(2) General Physics(2)

大一，2，選，3 學分

本課程為一基礎課程，主要延續普通物理學(1)之教學內容，持續就光學/電學/磁學等物理科學知識以及相關的基本原理進行介紹。希望透過這門課程，能夠讓學生清楚明白到未來將接觸到的相關知識；同時，也讓學生能夠對於將鑽研的方向有辨識以及選擇的能力。

(缺英文課綱)

20778 普通物理學實驗(2) General Physics Lab(2)

大一，2，選，1 學分

本課程之目的為使學生藉由物理實驗過程來印證古典力學、流體力學、熱力學之理論及定律，同時培養學生實作能力。課程內容包括：(1)基本量測，(2).自由落體，(3)單擺，(4)摩擦係數，(5)力的分解，(6)碰撞，(7)表面張力，(8)固體比熱，(9)液體比熱，(10)線膨脹。

20695 專利檢索與分析 Patent Survey and Analysis

大二，1，選，3 學分

本課程將近年來所發表部份文稿並將之整理，其中包括專利制度之研究，化學品、醫藥品、植物新品種及生物技術之專利保護，立法例及重要案例分析，以及專利技術與產業技術革新之關係。

Course this publish some manuscript combine arrangement it, including research of patent system in recent years, patent protection of the chemicals, medical product, new variety plant and biotechnology, legislative example and important case analysis, and the relation between patented technology and industry's technological innovation.

電化學 Electrochemistry

大二，1，選，3 學分

電化學是一門涉及電子與化學反應相互關係的科學，而電子的各種性質與行為，在近百年來，才逐漸明瞭。使得電化學雖比其他科學古老，但發展卻較為延遲。然而在環保意識高漲的今日，電化學已成為一門「新興」且倍受期待的科學。

Electrochemistry is a science of involving electrons and chemical reaction interreaction, and various kinds of nature and behavior of the electron, in the last hundred years, clear gradually. Make electrochemistry although older than other science, development is comparatively postponed. But today surging in environmental consciousness, electrochemistry has already become a 'new developing' and science expected extremely.

科技英文實務 Proficiency in Technology English

大二，1，選，3 學分

本課程主要教授科技英文之閱讀技巧，進行科技英文文章之閱讀練習，協助學生能在科學或工程領域中閱讀、瞭解、並擷取重要科技資訊，以及在句型、寫作風格與表達方式。

This course aims at teaching the reading ability on technical English papers and assisting students to study, understand and access the important technical information in science or engineering fields. The focus is put on the application of students' knowledge of this genre, frequently employed sentence patterns, vocabulary items and expressions.

材料化學 Material chemistry

大二，2，選，3 學分

此課程主要對各種材料之介紹，已說明其特性，機械強度，腐蝕情形為主，並且說明各種材料之製造程序。**(技職網填報時要求需滿足 50 字以上)**

This course has already stated its characteristic to the introduction to various kinds of materials mainly, mechanical intensity, corrode the situation as the main fact, and explain the manufacture procedures of various kinds of materials.

固態物理導論 Solid State Physics

大二，2，選，3 學分

介紹晶體的各種完美結構，缺陷結構的形成與各種物理特性的相互關係，電子的波動與粒子之性質，電子於自由電子能量井，固態中行為與能帶觀念之介紹，固態材料的鬆散行為，固態的介電性質。

An introduction to Solid-State Physics in materials science

電磁學 Electromagnetics

大二，2，選，3 學分

電磁學核心只有四個部份：庫倫定律、安培定律、法拉第定律與麥克斯威方程式(技職網填報時要求需滿足 50 字以上)

The electro magnetics core has four parts only: Law of Ulan Bator, Ampere's law, Faraday's law and Mike's majestic equation preface then

非破壞檢測 Nondestructive Testing

大二，2，選，3 學分

「非破壞檢測」對材料的品質保證有著密不可分的關係，因為它是屬於非破壞性的測試，應用的時機非常具有彈性—材料使用前或使用後，甚至是在使用中皆可作檢測的工作，因此它對一些產業(如航太工業)是不可或缺的。此課程的教授是先介紹各種非破壞檢測技術的原理、優缺點與應用對象，再擇其中如渦電流檢測及磁漏測試等作較深入的討論。

An introduction to Nondestructive Evaluation of various materials and their application.
(和中文版不同??)

金屬熱處理 Heat Treatment of Metals

大二，2，選，3 學分

本課程將介紹金屬材料熱處理之基本原理，並於課程中介紹目前產業最先進之熱處理技術與工程實務，以及品質工程，使學生能深入了解產業應用此製程技術之核心。其授課內容包括金屬熱處理原理、硬度與硬化能、熱處理爐及其相關設備、熱處理製程控制、碳鋼熱處理、合金鋼熱處理、不銹鋼熱處理、工具鋼熱處理、鑄鐵熱處理、熱處理品質與製程保證

The aim of this course unit is to acquaint the students with the basic principles of heat treatment of metals. The course also introduces to the students the advanced technology and engineering practices of heat treatment industry field. With the background, a course

section on quality engineering topic is presented. It is hoped that it will be very useful to students who have to learn about the essential area of this processing technology. The content includes Fundamentals of the Heat Treatment of Metals、Hardness and Hardenability、Furnaces and Related Equipment for Heat Treatment、Heat Treatment Processes Control、Heat Treatment of Carbon Steels、Heat Treatment of Alloy Steels、Heat Treatment of Stainless Steels、Heat Treatment of Tool Steels、Heat Treatment of Cast Irons、Assuring Quality in Products and Processes of Heat Treatment

機械冶金 Machine metallurgy

大三，1，選，3 學分

本課程說明金屬材料在外力作用下的各種基本現象和金屬內部組織結構的關係，闡明其物理本質。並且探討金屬製件在在外力作用下損傷的原因及強韌化措施。

This course states the relation of institutional framework within various kinds of basic phenomena and metal under external force function of metal material, expound its physics essence. Measure that and probe into the metal and makes a reason to damage under external force function and melts toughly.

金屬腐蝕與防蝕 Corrosion & Protection of Metals

大三，1，選，3 學分

本課程將介紹金屬腐蝕之基本原理，並於課程中介紹目前產業最先進之防蝕技術與工程實務，以及表面工程，使學生能深入了解產業應用此製程技術之核心。其授課內容包括金屬腐蝕原理、電化學機構、腐蝕電動勢及電極電位、極化及腐蝕速率、鈍化、應力腐蝕、大氣腐蝕、散亂電流腐蝕、氧化反應、陰極防蝕、塗層及抑制劑、材料選擇與設計

The aim of this course unit is to acquaint the students with the basic principles of metal corrosion. The course also introduces to the students the advanced technology and engineering practices of corrosion control industry field. With the background, a course section on advanced surface engineering topic is presented. It is hoped that it will be very useful to students who have to learn about the essential area of this processing technology. The content includes Principles of Metal Corrosion、Mechanisms of Electrochemical、EMF of Corrosion and Electrode Potential、Polarization and Corrosion Rate、Passivity、Stress Corrosion、Atmospheric Corrosion、Stray Current Corrosion、Oxidation Reactions、Cathodic Protection、Coatings and Inhibitors、Material Selection and Design

半導體製程導論 Introduction to Semiconductor

大三，1，3 學分

本半導體製程導論為教導學生對半導體製程的基本原理認識，以及深入瞭解半導體材料與設備、半導體製作與半導體產業之運作，運用業界所普遍使用的半導體材料與設備介紹，使學生瞭解材料工程師在半導體業界可扮演的角色與任務。授課內容包括積體電路生產簡介、半導體基礎、晶圓製造、加熱製程、微影製程、電漿原理、離子佈植、蝕刻、化學氣相沈積及金屬化製程

20996 電子材料 Electronics Materials

大三，1，選，3 學分

本課程是介紹電子元件，以半導體積體電路為主的製作，數百種的材料，包括有機和無機、化學材料、金屬材料、半導體材料。型式有氣體、液體、固體或電漿。以及和材料相關的設備、製程、廠務及檢驗分析等等。

This course is to introduce the electronic element, the making relying mainly on semiconductor integrated circuit, several hundred kinds of materials, including organic with inorganic, chemical material, metal material, semiconductor material.

There are gas, liquid, solid or electric thick liquid in the model. And equipment that correlated with material, make Cheng, factory's affair and examining analysing etc.

22065 電工學 Electrical Engineering

大三，1，選，3 學分

學生在校實習時或校外實際工作時，經常與機械及電有關機具接觸，故學生應對電路、電動機、變壓器等有所認識，方可減少工作傷害，確保安全。

Student while practising in the school or when being outside school real work, related to machinery and electricity machines often keep in touch, so students should know to circuit, motor, voltage transformer, etc. to some extent, can reduce the working injury, guarantee the security.

21880 生醫材料 Introduction to Biomaterials

大三，1，選，3 學分

本課程規劃在讓學生認識生物醫學材料的發展概念和應用，著重在於材料在組織替代與植入物上扮演的角色，與其機械與生物性質在應用上的重要性。

The aim of this course unit is to acquaint the student with the concept and applications of synthetic materials as prostheses for natural tissue replacement, and the mechanical behaviour of components of human body.

計算材料學與實務 Computational Materials Science and Practice

大三，1，選，3 學分

電腦模擬在科學技術領域日益重要，已成為材料研究領域的重要新興科學，也是材料組成、結構、性能及材料成型過程能預測量化的主要方法。介紹計算材料科學的基本原理與內容，以及運用電腦進行計算模擬之技術，並以實例說明電腦模擬在材料科學的應用

Computer simulation is an important research field of Material science and engineering. The material composition, microstructure, property and also one of quantitative research methods of Materials processing. To introduce the basic principle and content of computational materials science, as well as several common simulation techniques. Some applications of the techniques on materials science will be also exercised.

材料機械性質 Mechanical Behaviors of materials

大三，2，選，3 學分

材料機械性質是一門探討金屬在承受應力下所表現的行為及反應的專業知識領域。本門課分為三大部分：第一部分，機械基礎，討論數學架構及應力應變關係；第二部分，冶金基礎，從結構觀點討論塑性變形及破壞；第三部分，機械性質測試，以工程觀點對材料在機械性質測試後之破壞進行探討。

Mechanical metallurgy is the area of knowledge which deals with the behavior and response of metals to applied forces. This course will be divided into three parts. Part One, Mechanical Fundamentals, presents the mathematical framework and stress-strain relationships for many of the chapters will follow. Parts Two, Metallurgical Fundamentals, deals with the structural aspects of plastic deformation and fracture. Part Three, Application to Materials Testing, deals with the engineering aspects of the common testing techniques of mechanical failure of metals.

21689 奈米材料 Nanometer-Scale Materials

大三，2，選，3 學分

介紹各種奈米結構材料：奈米碳管、奈米線、量子點、量子線和奈米複合材料的基本特性以及製備與應用技術，期能對奈米材料的物性、製造與應用有整體的認識。

This course will deal with the chemical and physical properties of nanomaterials. It will cover the preparation, structure, properties and applications of quantum dots and lines, carbon nanotubes, and nanocomposites.

相變化 Transfan

大三，2，選，3 學分

本課程以材料熱力學為基礎，討論材料相變化之基本原理與機構，內容將包含各種相圖、擴散理論、界面，固化、擴散型相變化和非擴散型相變化。

The main purposes of this course are to introduce the phase transformations in solid material. The course includes phase diagrams, diffusion, crystal interface, solidification, diffusional transformations and diffusionless transformations.

21987 表面工程 Surface Engineering

大三，2，選，3 學分

材料表面處理是各種製造工業不可或缺的過程，不論是傳統的工業或現代的高科技產業，表面處理都一直扮演著極重要的角色。本課程主要是對表面處理技術在理論基礎，方法與應用等方面的講述，以期培養學生的興趣與專業的知識。課程內容包括表面處理技術的基本理論，前處理技術，各種表面處理的方法與相關知識，以及各種表面處理技術的應用等項目。

Surface coating and chemical surface treatment are the main subjects to be taught in this course. The phase composition of the each coating methods is introduced initially. Association of theses process with chemical pre-treatment of the material surface is reviewed next. Both experimental procedures and techniques base on concepts of electrode reactions and impedances are discussed during the entire presentation of this course.

生物科技概論 Introduction of. Biotechnology

大三，2，選，3 學分

生物科技的學術研究除了解決糧食生產的問題之外，對於醫藥保健、環境復育，甚至國防安全均有其廣泛的重要性。生物科技的學術研究除了解決糧食生產的問題之外，對於醫藥保健、環境復育，甚至國防安全均有其廣泛的重要性

Academic research of biotechnology besides solving the problem of grain-production, reply and breed medicines and health protection, environment, even the national defence has its extensive importance safely.

20463 品質工程 Quality Engineering

大三，2，選，3 學分

教導學生了解，近世紀以來由於經濟性與多樣化成為產品發展主要考慮因素，使得「品質」要求已從觀念性或直覺性的描述而演變成為具體量化的品質特性指標，因而在品質技術發展上產生了許多實用的技術和方法以迎合產品發展各階段實際的需要，經過多年的技術研發及經驗累積，我們能提供由產品研發、商品化、試量產、量產、售後維護等完整的品質技術服務。採用工業界普遍的在應用「田口方法」，「田口方法」的理論簡短易懂的，化繁為簡，避開艱澀難懂的統計學觀念，使此方法能讓一般大專程度的工程師也能接受、了解、而加以應用。

The objective of this course is to introduce the Taguchi Methods as a tool to handle the quality engineering of product. The Taguchi method is known as the simple and fast toll for industries applications. The S/N ratio derived from cost functions is the most power analysis criteria for quality. The optimun paremeter design is the main idea of this course. ANOM and ANOVA are introduced in detail. A final project is presented in the end of the course.

21780 半導體製程實作 Introduction to Semiconductor Manufacturing

大三，2，選，1 學分

本半導體製程導論為教導學生對半導體製程的基本原理認識，以及深入瞭解半導體材料與設備、半導體製作與半導體產業之運作，運用業界所普遍使用的半導體材料與設備介紹，使學生瞭解材料工

程師在半導體業界可扮演的角色與任務。授課內容包括積體電路生產簡介、半導體基礎、晶圓製造、加熱製程、微影製程、電漿原理、離子佈植、蝕刻、化學氣相沈積及金屬化製程

(缺英文課綱)

貴重儀器實習 Practical Precious Instrument

大三，2，選，1 學分

本課程讓學生了解材料相變特性、顯微組織、成分分析與圖案化之原理及其應用，並安排示範操作及實作訓練課程，讓學生充分了解各項設備的功能，進而有深刻認識並用於其研究工作。授課內容為熱分析，顯微鏡、X 射線與雷射系統之原理與機台操作。

The aim of this course is to acquaint the students with the principles of phase transformation, microstructure, element and patterning. The course also arranges the practical sessions to the students in order to fully understand the functions in our system. The students can make use of the system on their research in the future. This course includes the principle and structure of DSC, SEM, qualitative X-ray analysis, laser and practical operating in our equipment.

21881 能源工程 Energy Engineering

大四，1，選，3 學分

本課程著重於推動熱力、流力、熱傳、電機、能源等相關科目之傳授。學生於修習基礎課程及核心課程後，將對能源工程具有基本之概念。

This course focuses on promoting heating power, flowing such the teaching of relevant subjects as strength, heat spreading, electrical machinery, energy, etc. And after the key course for student's basic course in cultivation, will have basic concepts to the energy project.

電子元件物理 Electric Component of Physics

大四，1，選，3 學分

自從 1947 年的雙極性電晶體發明後，半導體元件即快速成長。本課程就元件物理和工作原理，做詳盡的敘述，每一單元多少會用到 MATLAB 軟體程式，做為學生電腦輔助學習用，本科目極適合在大學四年級和研究所授課。

課程涵蓋有：

- 一、半導體概論
- 二、載子模型-量子化觀念
- 三、載子擴散、漂移與再結和

- 四、基本元件製程
- 五、PN 接面二極體
- 六、光電元件
- 七、MS 接觸與蕭特基二極體
- 八、接面型場效電晶體 JFET
- 九、金氧半型場效電晶體 MOSFET
- 十、量子力學概論

Since the bipolar junction transistor (BJT) was developed in 1947, Semiconductor devices were grown rapidly. This course contains physics of devices and the theory of operation, it will be described detail. Each topic from this course used MATLAB software to be computer-assisted learning for students. The course is intended for undergraduate seniors or graduate students.

The course contains ten chapters, covering :

- 1、Semiconductor introduction
- 2、Carrier Modeling-The Quantization Concept
- 3、CarrierAction: Drift, Diffusion and Recombination
- 4、Basics of Device Fabrication
- 5、PN Junction Diodes
- 6、Optoelectronic Diodes
- 7、MS Contacts and Schottky Diodes
- 8、Field Effect Devices - JFET
- 9、MOSFET
- 10、Elements of Quantum Mechanics。

30106 表面處理科技特論 Advanced Surface Treatment Technology

大四，1，選，3 學分

本課程規劃在讓學生認識表面處理科技的發展和應用，著重在於熱處理、鋼鐵表面處理、防蝕與陽極處理及其他特殊機能表面處理技術理論與實務上的重要性。

The aim of this course unit is to acquaint the student with the concept and applications of advanced surface treatment technology. The course will focus on teaching the theoretical and practical knowledge of heat treatments, steel surface treatment technologies, corrosion resistance treatments, anodic treatments and other special functional surface treatment technologies.

20451 非破壞檢測與實務

Nondestructive Testing

大四，1，選，3 學分

本課程目標將介紹非破壞檢測之方法、理論及程序步驟，並於課程中介紹目前非破壞檢測技術之應用現況，以及材料破損分析實務，可使學生獲得相關之知識與實務，使成為日後職場之重要技能。本課程授課內容包括：液滲檢測技術、超音波檢測技術、射線檢測技術、渦電流檢測技術、磁粉檢測技術及破損分析等。

The objectives of this course are to introduce to the students the methodology, theory, and procedures of non-destructive test. The course also introduces to the students the application practices in non-destructive testing field. With the background, a course topic on the failure analysis is presented. Students are expected to gain the related practical knowledge and will become their critical skill in the future. Main topics of this course include: liquid penetrant inspection, ultrasonics inspection, radiography inspection, eddy-current inspection, magnetic particle inspection

21691 薄膜技術

Thin Film Technology

大四，1，選，3 學分

讓學生在修習此一課程後，能對薄膜工程有基礎的認識，以利就業與研究工作的進行。(技職網填報時要求需滿足 50 字以上)

Let this course in cultivation of students be back, Yes understanding that the project of the membrane has the foundation, with the going on of the favourable employment and research work.

微機電導論

Introduction to Microelectromechanical Systems

大四，1，選，3 學分

為教導學生對微感測器設計與製程的基本原理認識，以及深入瞭解感測器材料與相關製程設備、感測器製作與感測器產業之運作，運用業界所普遍使用的感測器材料與設備介紹，使學生瞭解材料工程師在感測器研發與製作可扮演的角色與任務。授課內容包括微機電系統簡介、微感測器簡介、環境感測器、車輛感測器。

(缺英文課綱)

22047 材料選用

Materials Selection

大四，1，選，3 學分

在一般材料使用，或估價、規格時，諸如『JIS G4303 之類似鋼種，在 ASTM 中是相當於哪一種鋼種？』；在各國材料規格的设计與相關性，於實際的效率化或各種金屬材料的多樣化方面，以日益重要。本課程主要係介紹，各國材料之規範，以及其使用時應注意的事項，尤其是日本規格與美國規格。課程內容主要包括：JIS 手冊讀法與使用法、JIS 材料特性、ASTM 手冊讀法即使用法、ASTM 材料特性、CNS 與 DIN 手冊讀法、材料選用要領、以及實例分析。

This course will provide a basic understanding how metal are used and treated during some various designs; also, the relationship of some various standard systems are explained, particularly in JIS and ASTM systems. The main topics offered in this course include: an introduction of JIS handbooks, the characteristic of JIS system, an introduction of ASTM handbooks, the characteristic of ASTM system, an introduction of CNS, DIN, AISI, and ISO systems, how to select and how to treat, and some case studies.

校外實習(學期) Internship(Semester)

大四，2，選，9 學分

為促進產學間技術與人才之交流，提升產學合作研發能量，增加學生校外實習機會，並為企業培育未來人才，特開設本課程。修習本課程之學生將在授課教師與指導教授協助之下進入業界以實習工程師進行至多六個月的實習。以其學生在畢業以前能深入了解業界生態，培養就業技能，並增進其職場競爭力。

(缺英文課綱)

生物光源技術 Bio-light Technology

大四，2，選，3 學分

本課程旨在加強學生對生物技術之了解、其範圍涵蓋遺傳工程技術、細胞融合技術和蛋白質工程技術等三大領域的理論和臨床上應用等方面的學習，培養生物技術相關人才為目的。

The curriculum will emphasize three major areas, including genetic engineering, hydridoma techniques and protein engineering .The purpose is to train students understanding the concept of biotechnology and their applications.

複合材料力學 Mechanics of composite materials

大四，2，選，3 學分

讓學生在修習此一課程後，能對複合材料(主要是以纖維複合材料為主)有深入的了解，以利研究工作的進行。(技職網填報時要求需滿足 50 字以上)

Let student after cultivation course this, can be to the composite(mainly take fibre composite as the core) There is deep understanding, with the going on of favourable research work.

新興科技產業分析 Emerging Technology Industry Analysis

大四，2，選，3 學分

本課程教學在於培養學生之新興科技產業發展架構的理論基礎及說明五種新興科技發展；其授課內容包括新興科技產業、國家近期重點科技發展、新興科技與經濟關係、產業分析工具、新興科技產

業分析（一~五）--智慧化居住、前瞻材料、綠色能源、半導體、生物科技、智慧型機器人及個案研討。

This course will develop the student's capabilities to analyze particular emerging technologies for technology monitoring, forecasting, and assessment, and exploration of five emerging technologies. The content includes fundamentals of the emerging technology、national mid-term and long-term science and technology development plan、economy relationship and emerging technology relationship、 industrial analysis tools 、emerging technology industry analysis (1~5) — intelligent home 、 smart materials、green energy、 semiconductor、biotechnology、intelligent robotics and case Studies.

電子構裝技術 Electronics Packaging

大四，2，選，3 學分

本課程主要是說明如今半導體封裝中的大概製程，並且敘述整段製程的詳細內容與現代產業的新興技術。（技職網填報時要求需滿足 50 字以上）

This course is mainly nowadays explained probably making to Cheng in semiconductor encapsulation, narrate whole sections of new developing technology of detailed content and modern industry to make Cheng.

30078 材料接合技術 Materials Joining Technology

大四，2，選，3 學分

本課程將介紹銲接冶金之核心理論，並於課程中介紹目前產業最先進之銲接製程，以及破損分析，使學生能深入了解材料銲接之關鍵技術。

The aim of this course unit is to acquaint the students with the core principles of welding metallurgy. The course also introduces to the students the advanced welding processes. With the background, a course section on fracture analysis topic is presented. It is hoped that it will be very useful to students who have to learn about the features and the key technologies in materials welding.

先進材料學士學位 學程 大學部 課程與核心能力關聯表

【專業必修】					
核心能力項目 科目名稱	運用基礎 科學與工 程知識之 能力	實驗數據 處理及分 析之能力	有效溝通 與團隊合 作之能力	終身自我 學習成長 之能力	專業倫理 與社會責 任之涵養
材料科學導論 Introduction to Materials Science and Engineering	*	*		*	
材料實驗（1） Fundamental Experiments in Materials(I)	*	*	*	*	*
材料熱力學(1) Thermodynamics of Materials(1)	*	*		*	
工程數學 Engineering Mathematics	*	*		*	
金屬材料 Metallic Materials	*	*		*	
近代物理 Concepts of Modern Physics	*	*		*	
材料實驗（2） Fundamental Experiments in Materials(II)	*	*	*	*	*
物理冶金(1) Physical Metallurgy(1)	*	*		*	
陶瓷材料 Ceramic Materials	*	*		*	
有機化學 Organic Chemistry	*	*		*	
材料熱力學(2) Thermodynamics of Materials(2)	*	*		*	
高分子材料 Polymer Materials	*	*		*	
材料實務專題 Practice of Material Topics	*	*	*	*	*
物理冶金(2) Physical Metallurgy(2)	*	*		*	
材料分析 Materials Analysis	*	*	*	*	*
X 光晶體繞射學導論 X-ray Diffraction	*	*		*	

【專業必修】					
核心能力項目 科目名稱	運用基礎 科學與工 程知識之 能力	實驗數據 處理及分 析之能力	有效溝通 與團隊合 作之能力	終身自我 學習成長 之能力	專業倫理 與社會責 任之涵養
電子顯微學 Electron Microscopy	*	*		*	
工廠管理 Factory Management	*	*	*	*	*
校外實習 Internship	*	*	*	*	*

先進材料學士學位 學程 大學部 課程與核心能力關聯表

【專業選修】					
<div>核心能力項目</div> <div>科目名稱</div>	運用基礎 科學與工 程知識之 能力	實驗數據 處理及分 析之能力	有效溝通 與團隊合 作之能力	終身自我 學習成長 之能力	專業倫理 與社會責 任之涵養
材料工程概論 Introduction to Materials Engineering	*	*		*	
電腦繪圖 Computer Drafting	*	*		*	*
普通物理學(2) General Physics (2)	*	*		*	*
普通物理學實驗(2) General Physics Lab. (2)	*	*	*	*	*
專利檢索與分析 Patent Survey and Analysis	*	*	*	*	*
電化學 Electrochemistry	*	*		*	
科技英文實務 Proficiency in Technology English	*	*		*	*
材料化學 Material chemistry	*	*		*	
固態物理導論 Solid State Physics	*	*		*	
電磁學 Electromagnetics	*	*		*	
非破壞檢測 Nondestructive Testing	*	*		*	
金屬熱處理 Heat Treatment of Metals	*	*		*	
機械冶金 Machine metallurgy	*	*		*	
金屬腐蝕與防蝕 Corrosion & Protection of Metals	*	*			
半導體製程導論 Introduction to Semiconductor	*	*		*	
電子材料 Electronics Materials	*	*		*	
電工學 Electrical Engineering	*	*		*	

【專業選修】					
核心能力項目 科目名稱	運用基礎 科學與工 程知識之 能力	實驗數據 處理及分 析之能力	有效溝通 與團隊合 作之能力	終身自我 學習成長 之能力	專業倫理 與社會責 任之涵養
生醫材料 Introduction to Biomaterials	*	*		*	
計算材料學與實務 Computational Materials Science and Practice	*	*	*	*	*
材料機械性質 Mechanical Behaviors of materials	*	*		*	
奈米材料 Nanometer-Scale Materials	*	*		*	
相變化 Transfan	*	*		*	
表面工程 Surface Engineering	*	*		*	
生物科技概論 Introduction of. Biotechnology	*	*		*	
品質工程 Quality Engineering	*	*		*	
半導體製程實作 Introduction to Semiconductor Manufacturing	*	*	*	*	*
貴重儀器實習 Practical Precious Instrument	*	*	*	*	*
能源工程 Energy Engineering	*	*		*	
電子元件物理 Electric Component of Physics	*	*		*	
表面處理科技特論 Advanced Surface Treatment Technology	*	*		*	
非破壞檢測與實務 Nondestructive Testing	*	*	*	*	*
薄膜技術 Thin Film Technology	*	*		*	
微機電導論 Introduction to Microelectromechanical Systems	*	*		*	
材料選用 Materials Selection	*	*		*	*

【專業選修】					
核心能力項目 科目名稱	運用基礎 科學與工 程知識之 能力	實驗數據 處理及分 析之能力	有效溝通 與團隊合 作之能力	終身自我 學習成長 之能力	專業倫理 與社會責 任之涵養
校外實習(學期) Internship(Semester)	*	*	*	*	*
生物光源技術 Bio-light Technology	*	*		*	*
複合材料力學 mechanics of composite materials	*	*		*	*
新興科技產業分析 Emerging Technology Industry Analysis	*	*	*	*	*
電子構裝技術 Electronics Packaging	*	*		*	*
材料接合技術 Materials Joining Technology	*	*		*	*

傳閱附件 6--時尚設計與管理系二技專班課程規劃案

二年制 時尚設計與管理系 二技學士課程規畫表

(106 學年度入學生適用)

(一)教育目標

- 1.提升流行機能性紡織品及美容產品研發與品質分析之能力。
- 2.配合國際時尚、服飾發展趨勢，融入台灣族群文化元素，強化織品、服飾及時尚整體造型設計人才之培育。
- 3.順應國際時尚產業結構之變遷以及資訊化的時代，提升時尚行銷及經營管理能力。
- 4.將學術研究、教學成果與產業界互相交流，擴大學生參與社區、族群及產業界之機會，培養具多元能力之時尚專才。

畢業學分總表

必修科目總稱 Names of Courses in Chinese and English	學 分 數 No. Credits	第一學年 1 st Academic Year		第二學年 2 nd Academic Year		備註 Remarks
		1 st semester	2 nd semester	1 st semester	2 nd semester	
系共同必修學分 Required credits for the department	48	9	12	12	6	
選修學分數 Elective Credits for Local Students	24	9	5	6	6	
畢業學分 Credits counted for graduation	必修學分數 Required Credits for Local Students 48					合計 total 72
	選修學分數 Elective Credits for Local Students 24					

(二) 系共同必修 (Required Courses for the Department)

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
色彩學 Color Theory	2	2				
色彩學實習 Practice of Color Theory	1	1				
基礎設計概論 Introduction of Basic Design	3	3				
美容造型 Beauty Modeling	2	2				
美容造型實務 Internship in Beauty Modeling	1	1				
立體裁剪 Garment Draping	2	2				
立體裁剪實習 Practice of Garment Draping	1	1				
流行產業研究法 Fashion Apparel Market Research	3	3				
服裝畫 Fashion Illustration	3		3			
美髮造型 Basic Hair Design	2		2			
美髮造型實務 Practice of Hair Design	1		1			
服裝材料學 Textiles and Clothing Materials	2		2			
服裝材料學實驗 Lab. of Textiles and Clothing Materials	1		1			
服飾行銷學 Fashion Marketing	3		3			
成衣打版 Pattern Making	2		2			
成衣打版實習 Practice of Pattern Making	1		1			
服飾商品企劃 Fashion Merchandising	3		3			
人體工學 Human Factors Engineering	3			3		

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
服裝設計 Fashion Design	2			2		
服裝設計實習 Practice in Fashion Design	1			1		
消費者行為學 Consumer Behavior	3			3		
服裝構成學(1) Clothing Construction (1)	2				2	
服裝構成學實習(1) Practice of Clothing Construction (1)	1				1	
時尚彩妝設計 Makeup Design	2				2	
時尚彩妝設計實習 Practice of Makeup Design	1				1	
合 計	48	9	12	12	6	

(三)專業選修 (Elective Courses)

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
時尚美學 Fashion (Culture) Aesthetics	3	3				
創意彩妝學 Creative Make-Up	2	2				
創意彩妝學實習 Internship in Creative Make-Up	1	1				
服務業管理 Service Management	3	3				
時尚設計史 History of Fashion	2		2			
織品品質鑑定學 Textile Goods with Quality	2		2			
織品品質鑑定學實驗 Lab. of Textile Goods with Quality	1		1			
時尚推廣學	3			3		
進階髮型設計 Advanced Hair Design	2			2		
進階髮型設計實習 Practice of Advanced Hair Design	1			1		
創意染色設計與應用 Dyeing of Textile Goods	2				2	
創意染色設計與應用實習 Practice of Innovative Dyeing of Textile Goods	1				1	
多媒材表現技法 Techniques of Multi-media Presentation					3	
合 計	26	9	5	6	6	

時尚設計與管理系二技學士課程中英文摘要
Department of Fashion Design and Management

一、必修科目

1.Required Courses

762001 色彩學

2 必 葉曾欽、上

講授有關色彩應用上的基本法則，期使學生經由認識色彩、欣賞色彩，並能利用色彩美化人生。課程之主要內容包括色彩的本質、色彩的體系、色彩的感覺、色彩的混合與配色聯想、色彩的視覺效果及安全色彩。

762001 Color

2 R Tseng-Chin Yeh、F

This course focuses on the basic rules of color applications, including the nature of color, the system of color, sense of color, combination of color, and color selection. Students are expected to be able to recognize, appreciate, and eventually beautify their lives throughout the course.

762002 色彩學實習

1 必 葉曾欽、上

教導學生製作十二色相色卡、無彩色十一階明度色相、十階彩度色相、色立體色相面、色彩對比 color contrast、色彩的感質、分析服飾配色之色彩調和等，使用色彩擁有美麗的人生，利用色彩美化居住環境、衣著以及生活。

762002 Practice of Color

1 R TsengChin Yeh、F

The course concentrates on how to make color schemes (12-color cards), colorless lightness hue (11 levels), colored lightness hue (10 levels), three-dimensional color scheme, contrast, and analyzing the color harmony of apparels. The theories can be applied to beautifying students' living environment, dressing and their daily lives.

762003 美容造型

2 必 陳秀足、上

以培育優秀之彩粧工作人材為目標，將課程由淺入深將彩粧技術運用靈活呈現。教學內容含括工具使用、色彩搭配、彩妝平面與立體設計圖、專業精緻彩妝認知與流行文化結合運用、具變化性並有別於高職所學習之彩粧技巧。

762003 Beauty modeling

2 R Hsiu- Tsu Chen、F

Course content covers will make up the use of flexible presented as the goal, to foster excellent work of make-up talent. Teaching content encompasses tools, color matching makeup of plane and solid design, professional the delicate makeup cognitive and popular culture combined use with variability and different from the Vocational learn makeup techniques.

762004 美容造型實務

2 必 陳秀足、上

以培育優秀之彩粧工作人材為目標，將課程由淺入深將彩粧技術運用靈活呈現。教學內容含括工具使用、色彩搭配、彩妝平面與立體設計圖、給予學生正確之臉型修飾、專業精緻彩妝認知與流行文化結合運用、化妝技巧之運用具變化性並有別於高職所學習之彩粧技巧。

1.以培育優秀的彩妝專業人才為目標 2.培養彩妝專業人才應具備的專業素養與注重品德教育 3.具備未來就業市場競爭能力 4.培養設計美感激發創造潛力。

762004 Internship in Beauty modeling

2 R Hsiu- Tsu Chen 、F

Course content covers will make up the use of flexible presented as the goal, to foster excellent work of make-up talent. Teaching content encompasses tools, color matching makeup of plane and solid design, professional the delicate makeup cognitive and popular culture combined use with variability and different from the Vocational learn makeup techniques.

1. To nurture outstanding professional make-up target 2. Cultivate professional make-up should have the professionalism and attention to moral education 3. With the future job market competitiveness 4. Cultivate the creative potential of design aesthetic inspired

762005 基礎設計概論

3 必 黃淑芳、上

本課程透過理論與實務的演練，著重設計思考與設計感知之啟發。藉由對於色彩、圖案、造型、空間、裝飾等單元之練習，引導學生熟練於材料之運用、以及美的形式之呈現，以期能夠達到掌握設計的方法與敏感性。

762005 Introduction of Basic Design

3 R Shu-fang Huang F

Through theoretical and practical experiments, this course focuses on inspirations of design thinking and design perception. Practicing on the units of colour, pattern, form, space and decoration, etc., students will be guided to learn proficiently the use of materials, as well as to the presentation of aesthetic forms, to achieve the mastery of design method and practice sentivity.

762006 服裝畫

3 必 柯雪琴、下

介紹基本服裝畫技法及各種服裝素材的畫法，學習在人體上著裝時的各種形態畫法，運用各種不同的畫材呈現各種不同的風格，引導利用配色及著色技法做服裝設計的呈現並學習靜態展的呈現方法。

762006 Fashion Illustration

3 R Hsueh Chin Ko 、S

Introduce the basic dress painting skill method and various techniques of painting clothing material. Learn to apply various techniques of human body painting, make use of various different painting materials to present various styles, learn the skill of using nuance and applying color in costume design, and learn method of presentation in the static state exhibition.

762007 美髮造型

2 必 謝清秀、下

學習髮型設計首先要先了解整個頭髮的狀況，頭髮就像一般人，它有顏色，有不同的型態與尺寸，還有成份、結構組織、生長狀況，以及如何保健，維護它的健

康亮麗。其次是頭髮的造型，即髮型，髮型是運用各種剪髮工具如剪刀、削刀、打薄刀等及技巧，配合頭型、髮質、髮量、髮流、臉型以及個人習性、生活習慣，來達到頭髮造型的效果。

762007 Basic Hair Design

2 R Hsieh Ching Hsiu、S

The contents of this course include the introduction of hair structure, sculpting concepts-four basic hair cutting forms, finger position, design line, and texturizing. Throughout this course students will be able to understanding the foundation, and to achieve the predictable results by using the proper tools and skills

762008 美髮造型實務

2 必 謝清秀、下

此課程將藉由剪、燙、染、整的基本理念與技術，再將髮型與臉型、頭型的相互配合關係，做一組合搭配設計，包括流行性剪髮設計、燙髮設計與染髮設計，將髮型的形狀、線條和裝飾效果作一適當的安排，使髮型設計造型趨向高流行感與變化性，以期符合教學目標。

762008 Practice of Hair Design

2 R Hsieh Ching Hsiu、S

The concepts of this course are a perfect blend of fashion and hair design. Cutting ,is considered a sculptural technique. Perming , is to create a personal hair design. Coloring, is to realize that nature creates such an endless variety of haircolors. Throughout this course, students will be able to stay informed of the latest hair trends by following the fashion scene.

762009 服裝材料學

2 必 賴顯松、下

講述服裝原料之纖維、紗線、織物、編織物、不織布等的製法，以及物理的、化學的、機械的特性。課程內容包括纖維結構、纖維密度、濕、熱性質、抗張性質、時間效應及纖維化學特性等。

762009 Textiles and Clothing Materials

2 R Sang Song Lai、S

Study of textile materials such as fiber, yarn, woven fabric, knitted fabric, nonwoven fabric production techniques and their physical, chemical, and mechanical properties. The course covers fiber structure, fiber density, moisture, thermal property, tensile property, time effect, fiber chemical property, etc.

7620010 服裝材料學實驗

1 必 賴顯松、下

練習纖維製品之定量、定性鑑別，以及物理、化學及力學性能實驗。課程內容包括實驗概論、纖維結構與品質、紗結構性能、織物結構性能、抗張強度實驗及纖維化學特性等。

7620010 Lab. of Textiles and Clothing Materials

1 R Sang Song Lai、S

Practice of quantitative and qualitative materials validation on properties of material in terms of physics, chemistry, and mechanics. Course contents include the introduction to experimentation, fiber structure and quality, yarn structure, fabric structure and properties, tensile strength experiment, and fiber chemical properties.

762011 服飾行銷學

3 必 徐秀如、下

了解紡織及服裝工業與行銷的關係。學習發展，促銷，廣告與零售技巧之需求，以便學生能成功進入就職市場。主要目的是整合其創造力和服裝產業的商業型態，結合專業的流行教育及結實的行銷與管理的背景。

762011 Fashion Marketing

3 R Hsiu Ju Hsu、S

Fashion Marketing investigates the relationship between fashion industry and marketing. Learning the development, promotion, advertising, and retailing skills needed to enter the marketplace and succeed. The major integrates the creative and business aspects of the Fashion industry, combining a specialized education in Fashion with a solid background in Marketing and Management.

762012 人體工學

3 必 柯雪琴、上

講述人體工學之定義，人體計測法，人體因素計測法，和從人體因素看被服構成。藉由理解人體型態的基礎結構及人體機能的需求，掌握服裝與人體之間的合理條件，再注入服裝設計與製作，境而達到穿衣的舒適性及提升服裝學術研究領域。

762012 Human Factors Engineering

3 R Hsueh Chin Ko、F

The course covers the definition of human factors engineering, body measurement method, human factors measurement method, and human factors that constitute clothing construction. Anatomy and physiological needs are incorporated in the apparel design and production to provide 'dressing for comfort' and advance in academic research.

762013 服裝設計

2 必 柯雪琴、上

引導學習對現今流行動向的分析方法及解讀方式，指導使用多彩布料作配色調色及圖案設計練習方法及學習意義，探討學習用各種不同材質做引導設計的方法及成果評價方式。講解以視覺所感受的結果學習做有型的服裝創意設計的方法。

762013 Fashion Design

2 R Hsueh Chin Ko、F

Learn the analytical method and reading method of the present popular trend, receive instruction on the use of colorful cloth to make nuance, color adjustment, and pattern design practice method, and learn the method and result of guiding the design evaluation method with different materials. Explain in detail the result learning and the envisioned clothing creativity through the design method.

762014 服裝設計實習

1 必 柯雪琴、上

配合服裝設計理論課程，做流行動向分析報告的實習、布料配色計畫實習、各種素材的組合創意服裝設計實習及主題引導式服裝創意設計的實習，實際練習服裝設計技能與表達能力。

762014 Practice in Fashion Design

1 R Hsueh Chin Ko、F

Put the costume design theories in the curriculum into practice, such as analysis

of fashion trends, matching colors of the cloth, combinations of creative fashion designs with various materials, and theme-based designs. Actual practices will help improve designing skills and the ability to express.

762015 消費者行為學

3 必 徐秀如、上

了解消費者和家庭單位如何作購買決策，及為何不同的獨立個體/團體作不同的購買決策。以行為及心理理論概念應用在個人(個性、知識、動機、涉入、態度、信念和感覺)，次文化(種族、社會階層、家人及家庭單位、團體及個人影響)及文化層次。

762015 Consumer Behavior

3 R Hsiu Ju Hsu、F

Understanding how consumers and households make decisions, and why different individuals/groups make different decisions. The behavioral and psychological science concepts apply at individual (personality, knowledge, motivation, intentions, attitudes, beliefs, and feelings), subcultural (ethnicity, social class, family and household, group and personal influence) and cultural levels.

762018 時尚彩妝設計

2 必 陳秀足、下

1.以培育優秀之彩粧專業人材為目標，將課程彩粧創造力與運用能力發揮為教學內容。 2.課程內容包含進階彩妝工具使用方法、進階色彩搭配、高階彩粧技巧等學習為主；同時加入專業彩粧人員應俱備之基本素養教育訓練，讓學生以多元方式接觸學習『時尚彩妝設計』，且能正確表達專業知識為目標。

762018 Fashion make-up design

2 R Hsiu- Tsu Chen、S

1. Take cultivates the outstanding color make up specialized capable person as the goal, curriculum color make up creativity and utilization ability display for course content 2. The curriculum content contains each kind of cosmetics tool application method, the color to match, the color make up skill and so on for the study main foundation; Simultaneously joins the specialized color make up personnel should the ready basic accomplishment education and training

762019 時尚彩妝設計實務

1 必 陳秀足、下

1.以培育優秀之彩粧專業人材為目標，將課程彩粧創造力與運用能力發揮為教學內容。 2.課程內容包含進階彩妝工具使用方法、進階色彩搭配、高階彩粧技巧等學習為主；同時加入專業彩粧人員應俱備之基本素養教育訓練，讓學生以多元方式接觸學習『時尚彩妝設計』，且能正確表達專業知識為目標。

流行性，舞台性，各式實用但技巧難度較深之進階彩妝課程。提高學生實務技巧並且符合業界所需之人才。

762019 Internship in Fashion make-up design

2 R Hsiu- Tsu Chen、S

1. Take cultivates the outstanding color make up specialized capable person as the goal, curriculum color make up creativity and utilization ability display for course content 2. The curriculum content contains each kind of cosmetics tool application method, the color to match, the color make up skill and so on for the

study main foundation; Simultaneously joins the specialized color make up personnel should the ready basic accomplishment education and training.

Fashion , Stagecraft , Various types are practical, but the skillful difficulty compares the depth to enter the step cosmetics curriculum. Improve students' practical skills and talents to meet industry required.

762022 流行產業研究法

3 必 陳唯珍、上

課程提供學生有演練有關服飾市場調查之問題形成、問題確定、操作定義、研究設計、研究方法、問卷設計、資料蒐集及分析的經驗。行為研究的哲理及方法包括實驗法設計和進階研究技巧的評估，是課程所包含的部分之一。

762022 Fashion Apparel Market Research

3 R Wei-Chen Chen、F

This study provides the student with practical experience in research process of problem identification, problem definition, alternative identification, research design, methodology, questionnaire design, data collection and analysis in the apparel marketing. Philosophy and methods of behavioral research including experimental design and advanced evaluation research techniques are part of this study.

762023 實務專題

1 必 指導教授、上

本課程在訓練學生運用適當之研究方法完成專題計畫。學生將以團隊合作方式進行資料蒐集、分析、論文撰寫、與專題發表。

762023 Graduation Project

1 R Major Advisor、F

This course aims to develop students ability in completing research as well as cooperation work. Students will have to work as a group to finish a study with a special topic they choose. A final oral presentation will be held later this year.

762024 成衣打版

2 必 柯雪琴、下

本課程講授涵蓋一般設計打版與工業用打版的差異、工業用版子的記號、縫份尺寸的設定、版子放縮尺寸理論、排版策略；原型打版理論、胸褶轉移方法。

762024 Pattern Making

2 R Hsueh Chin Ko、S

This course demonstrates the function to create the original vectored patterns and to input the paper patterns for later alteration and grading by using the professional apparel industrial. Through the marker making, it enables the students to manipulate the material savings for the high apparel productivity.

762025 成衣打版實習

1 必 柯雪琴、下

本課程主要讓學生學習一般設計打版與工業用打版的差異、設定工業用版子的記號、縫份尺寸的設定練習、設定版子放縮尺寸、排版、原型打版理論、胸褶轉移方法。

762025 Practice of Pattern Making

1 R Hsueh Chin Ko、S

This course demonstrates the function to create the original vectored patterns and to input the paper patterns for later alteration and grading by using the

professional apparel industrial. Through the marker making, it enables the students to manipulate the material savings for the high apparel productivity.

762026 服飾商品企劃

3 必 徐秀如、下

以認知整個服裝產業流程為學習出發點，學習以如何運用評估模式做企劃執行前評價，指導產業界目前執行的商品企劃模式，並與業界廠商直接做產學合作讓學生學習業界現場的企劃方法與企劃條件。

762026 Fashion Merchandising

3 R Hsiu Ju Hsu、S

To understand the entire clothing industry process as the starting point of study, learn how to utilize the model of evaluation to evaluate before implementation of the scheme, to guide the merchandizing model that is currently implemented by industry field, and engage in industry-school collaboration directly with the industry field to allow students to learn schematic method and schematic condition at industrial scenes.

762042 服裝構成學（2）

2 必 柯雪琴、下

結合服構成學（一）的基礎，講解新文化式原型的基本結構理論，依服裝種類學習打版方法及完成後的樣式認知，學習一般成衣生產流程及縫製管理方式與精品服飾的構成條件及構成方法。

762042 Clothing Construction（2）

2 E Hsueh Chin Ko、S

Combine the foundation of Clothing Construction I to explain the basic structure theory of the new cultural type prototype, study the method of pattern making and style cognition after completing in accordance with clothing category and learn general clothing production process and stitching management, constitution condition and constitution method of exquisite clothing.

762043 服裝構成學實習（2）

1 必 柯雪琴、下

結合服構成學（二）理論基礎，前半段分組練習設計製作高級套裝（設計、選購材料、打版、管理流程、製作流程、成品呈現），後半段練習設計製作中高年服裝（設計、選購材料、打版、管理流程、製作流程、成品呈現）。

762043 Practice of Clothing Construction（2）

1 R Hsueh Chin Ko、S

Combine the theoretical foundation of Clothing Construction II, former section to practice in group to make deluxe suits (design, selection of materials, pattern making, management process, production process, finished product presentation), and latter section to practice design of making clothing for the middle-aged and seniors (design, selection of materials, pattern making, management process, production process, finished product presentation).

762020 立體裁剪

必 陳唯珍、上

服裝設計的達成是根據利用對織品進行處理的操作手法，直接在人台上（身體形式）進行，其設計關鍵在於掌握織品、服裝設計樣貌和人台（身體形式）的間的

掌握。課程目的：(1) 服裝立體裁剪的原理(紋理、鬆份、平衡、切線)。(2) 直接在人台上巧妙地處理織品以創造欲想的設計效果。(3)辨認平面織品和在 3D 立體身體上的服裝兩者間的差異。(4)說明如何令人滿意地針對特定身材，達成服裝立體裁剪的合身性與製作的原則。(5)瞭解使用服裝立體裁剪完成服裝設計的好處和缺點。(6)透過服裝立體裁剪，以增加在服裝上產生獨創性設計的興趣，並借助於各種各樣靈感來源的啟發。

762020 Garment Draping

2 R Wei-Chen Chen、F

Garment design based on manipulation of fabric on a body form; emphasis on the interrelationships among fabric, garment design, and the human form. The objectives of the course:

- 1. To apply the principles of garment draping (grain, ease, balance, line) using a body form.**
- 2. To manipulate fabrics to create desired effects on a body form.**
- 3. To identify the relationship between fabric and the 3-dimensional appearance of the garment on the body.**
- 4. To apply the principles of fit and draping to produce a garment to satisfactorily fits a specific body.**
- 5. To understand the advantages and disadvantages of using draping techniques for garment design.**
- 6. To increase interest in originality and creativity in apparel design, using a variety of sources of inspiration.**

762021 立體剪裁實習

1 必 陳唯珍、上

服裝設計的達成是根據利用對織品進行處理的操作手法，直接在人台上（身體形式）進行，其設計關鍵在於掌握織品、服裝設計樣貌和人台（身體形式）的間的掌握。課程目的：(1) 服裝立體裁剪的原理(紋理、鬆份、平衡、切線)。(2) 直接在人台上巧妙地處理織品以創造欲想的設計效果。(3)辨認平面織品和在 3D 立體身體上的服裝兩者間的差異。(4)說明如何令人滿意地針對特定身材，達成服裝立體裁剪的合身性與製作的原則。(5)瞭解使用服裝立體裁剪完成服裝設計的好處和缺點。(6)透過服裝立體裁剪，以增加在服裝上產生獨創性設計的興趣，並借助於各種各樣靈感來源的啟發。

762021 Practice of Garment Draping

1 R Wei-Chen Chen、S

Garment design based on manipulation of fabric on a body form; emphasis on the interrelationships between fabric, garment design, and the human form. The objectives of the course:

- 1. To apply the principles of garment draping (grain, ease, balance, line) using a body form.**
- 2. To manipulate fabrics to create desired effects on a body form.**
- 3. To identify the relationship between fabric and the 3-dimensional appearance of the garment on the body.**
- 4. To apply the principles of fit and draping to produce a garment to satisfactorily fits a specific body.**

- 5. To understand the advantages and disadvantages of using draping techniques for garment design.**
- 6. To increase interest in originality and creativity in apparel design, using a variety of sources of inspiration.**

二、選修科目

2. Elective Courses

762028 時尚美學

3 選 謝清秀、上

美學作為一種學問，旨在探尋有關美與藝術的知識，就像所有其它的學問一樣，也有其獨特的方法。本課程首先針對美學加以闡述藝術、科學與倫理三者間的知識內容，進而指出科學真理中所隱含的藝術特質。其次探討傳統美學與當代美學家的不同觀點，以及其存在的意義與價值。

762028 Fashion Aesthetics

3 E Hsieh Ching Hsiu、F

The study of aesthetics is to discover all knowledge regarding beauty and art. Like any other study, aesthetics has its own learning methods. The course will look at art, science, and ethics and how art exists in science. Then the course will discuss the different perceptions on traditional aesthetics and contemporary aesthetics, as well as the significance and value of its existence.

762044 創意彩妝學

2 選 陳秀足、上

1. 以培育優秀之彩粧專業人材為目標，將課程彩粧創造力與運用能力發揮為教學內容。2. 課程內容包含各類彩妝工具使用方法、色彩搭配、彩粧技巧等為學習主要基礎，藉由不同的主題讓學生以多元方式學習各種不同的彩妝技巧以激發學生的想像力及創作能力。

762044 Creative make-up

1 E Hsiu- Tsu Chen、F

1. Take cultivates the outstanding color make up specialized capable person as the goal, curriculum color make up creativity and utilization ability display for course content 2. The curriculum content contains each kind of cosmetics tool application method, the color to match, the color make up skill and so on for the study main foundation; Simultaneously joins the specialized color make up personnel should the ready basic accomplishment education and training.

762045 創意彩妝學實習

1 選 陳秀足、上

利用光影.明暗.線條的技巧運用方式,教導學習彩繪與彩妝間之關聯性與不同點. 並利用骨骼之構造成完成修飾之技巧並教導各類型之彩繪技術與運用方式.

流行性彩妝之運用，具實用性及創意之進階性技巧，創意時尚彩繪化妝是彩妝加上彩繪技術，結合多元化妝技術與材質之運用，創造高階技術的研發。課程有年代創意彩妝、創意時尚彩繪化妝、噴槍創意彩妝等創新技術與設計。

762045 Internship in Creative make-up

1 E Hsiu- Tsu Chen、F

The use of light and shadow. Shading lines techniques use way to teach the correlation between different points in the study painted with makeup. Bones structure to complete the modification of the skills and teach various types of painted and use.

Fashion , Stagecraft , Various types are practical, but the skillful difficulty compares the depth to enter the step cosmetics curriculum. Improve students' practical skills and talents to meet industry required.

762029 時尚設計史

1 選 黃淑芳、下

本課程主要在探討從古代文化的時尚樣式到法國誕生女裝高級訂製服的時尚演變內容。本課程通過文化和歷史的介紹，提供回顧時尚樣式的週期本質，以及其本身視覺語言的意涵。從本課程中經過時尚歷史的回顧、以及其過去的影響，藉以反映在當代的時尚設計，以致創造一番新審美型態的時尚業表現。

762029 History of Fashion

1 E Shu-fang Huang、S

The course highlights key moments in the history of fashion and the evolution of the silhouette from the ancient civilization style to the birth of haute couture. This course will provide a visual language of fashion reviewing the cyclical nature of styles through a solid grounding in cultural and historical studies. The course aims to reflect upon the influence of the past upon contemporary fashion design. The recycling of styles is a phenomenon of the fashion industry, referring to the past to create a new aesthetic.

762032 時尚推廣學

3 選 王韻、上

教導學生在全球市場下，廣告促銷對流行產品的意義，以及對消費者、行銷市場所造成的影響。瞭解實上促銷學包含：促銷活動、公共關係、服裝秀、人員銷售、櫥窗佈置、廣告等等內容。

762032 Fashion Promotion

3 E Yun Wang、F

Impart the significance of product advertising promotion in global markets and its effects on consumers and marketing segments. Students are expected to learn about Fashion Promotion including, promotional activities, public relations, fashion shows, sales personnel, window display, advertising, etc.

762033 進階髮型設計

2 選 謝清秀、上

此課程目標設定在運用剪、燙、染、整、梳髮等各技巧組合搭配與多元化的學習。強調髮型整體設計，配合設計造型實務，以現場示範教學方式，引導學生在理論與實務上能掌握與設計具流行感的髮型。

762033 Advanced Hair Design

2 E Hsieh Ching Hsiu、F

This course is aimed to apply the combinative techniques and comprehensive study through hair cutting, perming, colouring, combing etc into hairstyle.

By using practical teaching method of demonstration emphatic the whole hairstyle in order to lead students are able to handle and design fashionable hair styling in the theoretical and practical practice.

762034 進階髮型設計實習

1 選 謝清秀、上

此課程目標設定在運用剪、燙、染、整、梳髮等各技巧組合搭配與多元化的學習。強調髮型整體設計，配合設計造型實務，以現場示範教學方式，引導學生在理論與實務上能掌握與設計具流行感的髮型。配合共同實際參與資料整理運用於髮型設計中，已達成學術並重的目的。

762034 Practice of Advanced Hair Design

1 E Hsieh Ching Hsiu、F

This course is aimed to apply the combinative techniques and comprehensive study through hair cutting, perming, colouring, combing etc into hairstyle.

By using practical teaching method of demonstration emphatic the whole hairstyle in order to lead students are able to handle and design fashionable hair styling in the theoretical and practical practice.

Operation with research and arranging the information to apply into the hairstyle to conclude the balance of the theoretical and practical purpose.

762038 創意染色設計與應用

2 選 葉曾欽、下

講授各種織品與染料之特性，染色用水、各種染色用之助劑、染料與纖維染色之理論，以及各種織品之精練、漂白與創意染色加工法、染色堅牢度之應用，織品之創意印花設計等。

762038 Dyeing of Textile Goods

2 E Tseng-Chin Yeh、S

The course emphasizes on the characteristics of textile and dyestuffs. The aim of the module is to explore the essential theories of scouring, bleaching, dyeing, color fastness of watering, medicine mixing, theory of dyeing and a variety of dyeing techniques and printing of textile.

762039 創意染色設計與應用實習

1 選 葉曾欽、下

學習及熟練各種織品（棉、麻、螺縐、羊毛、聚酯、尼龍等）之精練、漂白加工實驗，各種織品之浸染及壓染創意染色加工實習、染色堅牢度之應用試驗，織品之創意印花設計等。

762039 Practice of Innovative Dyeing of Textile Goods 1 E Tseng-Chin Yeh、S

This course takes practices and experiments on various mechanisms, including dip dyeing, pad dyeing, scouring, bleaching, dyeing of cotton and nylon fiber, printing, colorimetry, color testing, and the level of robustness test.

762049 服務業管理

3 選 王韻、上

首先了解服務的特色，並加入全球的觀點。接著從行銷的角度深入探究，包含溝通策略、服務品質、市場區隔、顧客導向、實體環境設計、人員銷售及相關服務

業的管理研究等內容。

762049 Service Marketing

3 E Yun Wang、F

Teach students understand the service marketing characteristics in both Taiwan and global view. Teach students know the personnel sales of promotion, and satisfy customers. Understand how to investigate the service quality, the difference of service in culture, the new technology of service marketing.

762059 織品品質鑑定學

2 必 賴顯松、下

學習織品品質鑑定的原理、方法和應用。課程內容包括基礎統計、檢驗樣本選擇、實驗設計、檢驗方法、標準與儀器使用、纖維品質鑑定、紗線品質鑑定、織物品質鑑定等。

762059 Textile Goods with Quality

2 R Sang Song Lai、S

Learn quality identification of textile goods in terms of principles, methodology, and application. Course contents include the elements of statistics, test design, the selection of samples for testing, and a method of assay, standard and instrument, fiber quality identification, yarn quality identification, fabric quality identification.

762060 織品品質鑑定學實習

1 選 賴顯松、下

實驗操作布料成份的分析、組織的測定、各種布料物性的測試，增加學生的研判性。課程內容包括織物瑕疵檢驗、染色堅牢度檢驗、纖維結構及種類鑑定、紗線結構與性質檢驗。

762060 Lab. of Textile Goods with Quality

1 E Sang Song Lai、S

Test validation on quality identification of textile goods in organization measurement and property of material. Course contents include the woven fabric defects, color fastness, fiber structure, type quality, and yarn structure and properties.

762069 多媒體表現技法

3 選 黃淑芳、下

本課程學習多媒材表現技法之範疇、應用、創作、賞析與討論。透過觀察與探索各樣媒材之特質，運用媒材的表現性與形式特質，從事藝術與設計創作。課程中，藉由多元媒材表現技法設計案例介紹，鼓勵學生體驗多元的當代藝術設計觀念，以深化學生對於視覺美學的涵養。結合多媒材表現技法的實務演練，來豐富其對於藝術設計創作之方法、創作技巧與設計內涵之表現。

762069 Multi-media Presentation Techniques

3 E Tseng-Chin Yeh、S

This course focuses on the scope, application, creation, appreciation and discussion of multi-media presentation techniques. Through observing and exploring the distinguishing characteristics of various materials, arts and design works are created by utilizing the forms of presentation and characteristics of materials. During the course, case studies concerning multi-media presentation techniques are introduced to encourage students to experience diverse modern arts design concepts

so as to cultivate students' appreciation of visual aesthetics. Hand-on practice which integrates multi-media presentation techniques is introduced to enrich students' knowledge in the methods of artistic design and creation, creation techniques and presentation of design concepts.

According to the levels of students, this course consists of two stages. In the primary stage, the practice of techniques of clothing construction such as body measurement and flat pattern will be emphasized and carried out on skirt-making. In the advanced stage, principles on pattern-making and clothing construction practices will be carried out on various skirts, shirts, pants and jackets.

農企業管理系馬來西亞境外碩士在職專班

(一)教育目標

1. 結合加強農企業管理理論與實務，協助馬國發展農業。
2. 促進馬來西亞各農企業領域(農用品、農場、農產加工、農產運銷、農業服務業)專精發展，使馬來西亞農業可以自給自足。
3. 以馬來西亞農企業(含農場)之經營管理為重點，假進馬來西亞農企業的發展。
4. 發展具有馬來西亞特色之農企業產業經營管理模式。

(二)校定共同必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
農企業管理特論 Special Topics for Agribusiness Management	2	2				
農企業研究法 Agribusiness Research Methods	2	2				
專題討論 Seminar	2		1	1		
碩士論文 Thesis	6			3	3	
合 計	12	4	1	4	3	

(三) 選修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
農企業風險管理專題 Seminar on Agribusiness Risk Management	3	3				
供應鏈管理 Supply Chain Management	3		3			
休閒農場經營管理專題 Seminar on Leisure Farm Management	3		3			
消費者行為分析 Analysis of Consumer Behavior	3		3			
跨國性農企業專題 Seminar on Transnational Agribusiness	3			3		
農產品行銷 Marketing of Agricultural Products	3			3		
休閒農業專題 Seminar on Leisure Agriculture	3				3	
組織理論與管理 Organization Theory and Management	3				3	
合 計	24	3	9	6	6	

馬來西亞境外專班 課程大綱

一、休閒農業專題 Seminar on Leisure Farm Management

- 1.目的：本課程旨在使學習者了解休閒農業之意義與發展背景，理論與類型，規劃設計的原理與方法，經營管理的策略與實務，解說服務的功能和技巧，教宣導的原則和方法，有關法令和規定，以及診斷評估的技術和方法，以增進學習者對休閒農業之知識及經營管理之能力。
- 2.教學內容：休閒農業理論、休閒農業之範圍與計畫、休閒農業相關法規與計畫、休閒農業之規劃與設計、休閒農業之經營策略、休閒農業經營管理、休閒農業之解說服務、休閒農業之教育宣導、休閒農業與農村文化發展、休閒農業之經營診斷與評估。
- 3.教學方法：(1)課堂講授 (2)分組討論 (3)參觀實習
- 4.教材：
主要教材：段兆麟，2011，休閒農業－體驗的觀點，偉華書局。
參考書目：(1)Crossley, John C.著，杜淑芬譯，1998，休閒遊憩事業的企業化經營，品度圖書公司。(2)Holloway, J Christopher, 1989, The Business of Tourism, C. R. Barber & Partners Ltd.(3)Pine, B. Joseph & James H. Gilmore, 1999, The Experience Economy, Harvard Business School Press. (4)其他參考文獻。
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The contents of the course are as following : Theory of leisure agriculture ; Scope and patterns of leisure agriculture ; Regulation and projects related to leisure agriculture ; Planning of leisure farms ; Strategy of leisure farm management ; Designing the experience activities of leisure farm ; Marketing, recreation, human resources, and financial management of leisure farms ; Explanation services of leisure farm ; Accommodation management for leisure farm ; The management of educational farms ; The management of Allotment ; Diagnosis to leisure farm ; Future development for leisure agriculture.

二、農企業管理特論 Special Topics for Agribusiness Management

- 1.目的：本課程之目的，在使學生瞭解源自農產品生物特性之農企業方面的特殊管理問題。
- 2.教學內容：本課程主要內容涵蓋農企業管理之主要研究方向以及現階段所面臨的特定議題。
- 3.教學方法：本課程採輪授方式進行由本系之研究所教學群之教師形成授課團隊。
- 4.教材：依授課教師。
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The purpose of this course is to discuss the special problems in agribusiness management that stemmed from the biological properties of agricultural products. The contents of the course are arranged according to the current issues feed by the agribusiness management and the topic areas of special concerns. The course is jointly provide by the gradate faculty of this department.

三、組織理論與管理 Organization Theory and Management

- 1.目的：本課程旨在探討組織行為，幫助學生瞭，各類型組織在規劃、執行及控制的管理行為。
- 2.教學內容：規劃以使命、目標、策略、政策、規則及預算為主軸；執行上以組織、用人、領導及激勵為重心，控制上討論品質控制、財務控制及文化。
- 3.教學方法：實體面授。
- 4.教材：主要教材：林永順著，2013，管理學，全力顧問有限公司。
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The objective of this course is to discuss organizational behavior. Help student to understand all types of organization in planning、executing and seeing. The core of planning are mission, objective, strategy, policy, rules and budget. The key topics of executing are organization, human resources and administration, leadership and motivation. In seeing, the major chapters are qualify control, financial control and culture.

四、農企業研究法 Agribusiness Research Methods

- 1.目的：本課程之目的，在幫助學生了解農企業研究的過程，使其能順利且有效地執行一項研究計畫，以解決管理上的各種問題。
- 2.教學內容：課程內容包括研究計畫書的撰寫與評估、研究設計的方法、資料收集的方式、資料分析、以及研究成果報告的表達。
- 3.教學方法：課堂講授、上機、作業、研討會、分組報告。
- 4.教材：(1)古永嘉、楊雪蘭編譯，2009/1(3rd)，譯自 Cooper, D. R. and P. S. Schindler, 2008-10e, Business research methods, McGraw-Hill C. Inc.，企業研究方法，華泰書局。(2)吳萬益，2011/1，企業研究方法(四版)，華泰書局。(3)莊立民、王鼎銘譯，2004，譯自 Cavana, R.Y., B.L. Delahaye, and U. Sekaran, 2000-3e, Applied business res.
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The purpose of this course is to provide students with the knowledge and skills of scientific method they need to solve the problems and meet the challenges of a fast-paced decision-making environment. The contents of this course include introduction to agribusiness research, design of research, the sources and collection of data, and analysis and presentation.

五、專題討論 Seminar

- 1.目的：本課程之目的，在使學生瞭解當前農企業管理之主要理論與思潮。
- 2.教學內容：在農企業之企業功能與管理功能的互動架構下，探討農企業管理的各種問題，並透過評論相關的實證研究，整理出農企業管理的未來新趨勢與理論。
- 3.教學方法：本課程安排在第二及第三學期講授，每次開課以 1 學分為原則，授課時數則視實際需要另行安排。
- 4.教材：依各指導教授。
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The purpose of this course is to explore the contemporary topics in theory and practice of agribusiness management by a global perspective. Under the framework of interrelationship between managerial functions and business functions, the major contents include the evolution of management thought and the patterns of management analysis, management and society, global and comparative management, etc. Several reviews of relative empirical study will be made to find the future tendency in agribusiness management. This course will be arranged in the second and the third semester with 1 credit hour work each semester.

六、消費者行為分析 Analysis of Consumer Behavior

- 1.目的：本課程目的在介紹消費者決策的本質及影響消費者決策過程的相關因素。
- 2.教學內容：這些影響因素包括外在環境、個人差異以及心理因素。課程亦將探討如何分析消費者的資料及規劃行銷策略。
- 3.教學方法：(1)課堂講授 (2)分組討論 (3)農企業消費者行為議題討論與報告。
- 4.教材：自編教材、參考他人教材：書名：Consumer behavior: building marketing strategy, 版本：10th ed, 作者：Del I. Hawkins, David L. Mothersbaugh, Roger J. Best, 出版商：麥格羅希爾、書名：Consumer Behavior: a strategic approach, 版本：最新版, 作者：Henry Assael, 出版商：雙葉書

廊、書名：消費者心理學--消費者行為的科學研究，版本：2008，作者：徐達光，出版商：東華，網址連結、書名：消費者行為分析，版本：2010，作者：林豐瑞、參考書目：書名：Consumer Behavior，版本：10th ed，作者：Roger D.Blackwell;Paul W.Miniard，出版商：ThomsonLearning、書名：Consumer Behavior，版本：10th ed，作者：Roger D.Blackwell;Paul W.Miniard，出版商：ThomsonLearning、書名：消費者行為概論，版本：2011，作者：林建煌，出版商：華泰、書名：消費者行為，版本：2004，作者：顧萱萱譯，出版商：雙葉、書名：消費者行為，版本：2001，作者：漆梅君，出版商：學富、書名：行銷研究-管理與技術，版本：八版，作者：黃俊英，出版商：華泰。

5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The purpose of this course is to introduce the nature of consumer decision-making and the influence upon this decision-making process. The influencing factors include the environmental influences, individual differences, and psychological processes. This course also let students learn how to analyze the data of consumers and to plan the marketing strategies.

七、供應鏈管理: Supply Chain Management

- 1.目的：本課程目的在使學生瞭解農企業如何將商品或原料自供應商至顧客，有效率且有效果地規劃、執行、控制產品和服務的流通和儲存。
- 2.教學內容：課程內容包括：導論、供應鏈網路結構、顧客服務、供應鏈之貨源規畫、供應鏈之資訊科技、委外策略、全球供應鏈、整合供應鏈管理之執行、供應鏈之績效評量。
- 3.教學方法：課堂教學+小組討論、其他。
- 4.教材：自編教材、參考他人教材（書名：現代物流管理：物流與供應鏈整合，版本：二版，作者：張有恆著，出版商：華泰文化）、講義、參考書目（書名：商業運籌管理：供應鏈觀點，版本：，作者：Coyle、Bardi、Langley 著，蘇雄義審譯，出版商：華泰文化、書名：物流與供應鏈管理：理論與實務，版本：，作者：Edward Frazelle 著，何應欽編譯，出版商：麥格羅·希爾、書名：Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies，版本：，作者：D. Simchi-Levi, P. Kaminsky, and E. Simchi-Levi，出版商：McGraw-Hil）。
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The objective of this course is to realize an agribusiness how to plan, implement, and control the efficient and effective flow and storage of goods and services. Course contents include: introduction of supply chain, demand management, customer service, information system of supply chain, physical operations, distribution center, strategic alliance, outsourcing logistics, global supply chain management, implementing integrated supply chain management, and supply chain performance measurement.

八、休閒農場經營管理專題 Seminar on Food Business Management

- 1.目的：本課程旨在使學生了解休閒農業之意義與發展背景、理論、類型，與相關法規，及休閒農場規劃設計的原理與方法、經營策略與管理實務，以增進學生對休閒農業之知識及經營管理之能力。課程架構如下：休閒農業理論、休閒農業之範圍與類型、休閒農業相關法規與計畫、休閒農場之規劃、休閒農場之經營策略、休閒農場體驗活動設計、休閒農場行銷、遊憩、人力、財務等管理、休閒農場之解說服務、休閒農場之民宿經營、教育農園經營、市民農園經營、休閒農場經營診斷、休閒農業未來發展。
- 2.教學內容：課程主要內容包括食品產業之介紹，食品保存方法，決策，溝通，食品品質，成本分析，人際關係處理技巧、說明、激勵、與領導，企業功能，以及食品公司之規劃、執行與控制。
- 3.教學方法：實體面授。
- 4.教材：主要教材：林永順，2015，看故事學經營學。

5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The contents of the course are as following：Theory of leisure agriculture；Scope and patterns of leisure agriculture；Regulation and projects related to leisure agriculture；Planning of leisure farms；Strategy of leisure farm management；Designing the experience activities of leisure farm；Marketing, recreation, human resources, and financial management of leisure farms；Explanation services of leisure farm；Accommodation management for leisure farm；The management of educational farms；The management of Allotment；Diagnosis to leisure farm；Future development for leisure agriculture.

九、碩士論文 Thesis Research

- 1.目的：碩士班學生在教授的指導下，撰寫論文，經口試及格後，才能獲得碩士學位。
- 2.教學內容：依論文主題具體進行。
- 3.教學方法：研究並撰寫論文。
- 4.教材：依各指導教授。
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

Under the direction of the Thesis Advisor, the student who seeks the masters degree must complete the thesis and pass the final oral examination.

十、跨國性農企業專題: Seminar on Transnational Agribusiness

- 1.目的：本課程係為使小型農企業發展成為跨國性農企業，具經營管理上的必要途徑考量，其目的有充分利用國際資源：原料、人才、資金、機器、管理。擴大市場：台灣只有二千三百萬人口，唯有跨國性企業才具規模經濟，以提昇競爭力。
- 2.教學內容：其重點包括：跨國性農企業的基本概念、跨國性農企業的理论及環境、跨國性農企業的策略、跨國性農企業的組織、領導及文化、跨國性農企業的管理。
- 3.教學方法：課堂教學＋小組討論、遠距輔助教學（非同步）。
- 4.教材：自編教材、參考他人教材及講義。
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The purpose of Transnational Agribusiness is to fully use of informational resources and market. It includes: Basic concepts for Transnational Agribusiness.；Theories and environment for Transnational Agribusiness；Strategy for Transnational Agribusiness；Organization, leadership and culture for Transnational Agribusiness；Transnational Agribusiness management.

十一、農產品行銷 Marketing of Agricultural Products

- 1.目的：瞭解農產品運銷制度、小農操作困境及計算出至少 5 項市場集中度指標、熟悉至少一種農產品之行銷實務與規劃。
- 2.教學內容：本課程旨在使學生了解農產行銷之理論與運作，以為農企業管理者因應行銷環境有效地行銷管理。內容包括：(1)農產行銷基本概念、(2)農產品供需與價格理論、(3)農產品市場與農產行銷企業、(4)農產品價格、(5)農產行銷績效、(6)農產行銷政策制度與法規。
- 3.教學方法：課堂教學、小組討論、遠距輔助教學(非同步)。
- 4.教材：主要教材：許文富，2012，農產運銷學。
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

This course gives students the knowledge of marketing of agricultural products. It includes: (1) the concept and operations of marketing of agricultural products, (2) theory of demand, supply, and price of agricultural products, (3) markets and marketing agribusiness, (4) prices of agricultural products, (6) marketing performance of agricultural products, and (6) policy and regulations of agricultural product marketing.

十二、農企業風險管理專題 Seminar on Agribusiness Risk Management

- 1.目的：本課程之目的在於闡述如何量化財務風險與使用。
- 2.教學內容：課程內容包含投資者與風險管理、風險管理價值、風險管理對於一般企業研究應用、遠期與期貨契約、避險與遠期與期貨契約、最適化避險、界定與處理現金流量、衡量與使用利息風險、避險與選擇權、選擇權定價、動態避險與二元常態模型、Black-Scholes 模型、債券與利率選擇權與最近風險議題。
- 3.教學方法：實體面授。
- 4.教材：自編教材、參考他人教材及講義。
- 5.教學環境：具單槍投影機、電腦主機及螢幕、筆記電腦、空調、麥克風。

The purpose of this course is to discuss how to quantify financial risks and manage them. The contents of this course include investors and risk management, creating value with risk management, a firm-wide approach to risk management, forward and futures contracts, hedging exposures with forward and futures contracts, optimal hedges for the real world, identifying and managing cash flow exposures, measuring and managing interest risks, hedging with options, option pricing, dynamic hedging, and the binomial model, the Black-Scholes model, options on bonds and interest rates and some recent developments in risk topics.

觀賞魚科技國際學位專班 碩士班

(一)教育目標

- 1.以水生動物疾病診斷及疫苗研發、育種繁養殖、器材與系統研發、行銷為四大主軸。
- 2.建構全英語教學與學習環境，促進國際學術與師生交流。

(二)必修科目

中 文 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
專題討論(1) Seminar1	1	1				
專題討論(2) Seminar2	1		1			
專題討論(3) Seminar3	1			1		
專題討論(4) Seminar4	1				1	
觀賞魚研究法(1) Research Methodology in Ornamental Fish1	1	1				
觀賞魚研究法(2) Research Methodology in Ornamental Fish2	1		1			
碩士論文 Thesis	6			3	3	
合 計	12	2	2	4	4	

(三) 選修科目

中 文 科 目 名 稱 英	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
專題研究(1) Independent Studies 1	1	1				
觀賞魚產業專論 Advanced Topics on Ornamental Fish Industry	2	2				
餌料生物培養技術專論 Advanced Topics on Live Food Culture in Aquaculture	2	2				
養殖環境管理與永續利用專論 Advanced Topics on Sustainable Aquaculture Management	2	2				
水產生物技術應用專論 Advanced Topics on Application of Biotechnology in Aquaculture	2	2				
魚類生殖生理學專論 Advanced Topics on Fish Reproductive Physiology	3	3				
魚類營養學專論 Advanced Topics on Fish Nutrition	2	2				
魚類免疫學專論 Advanced Topics on Fish Immunology	2	2				
無脊椎動物免疫專論 Advanced Topics on Invertebrate Immunology in Aquaculture	2	2				
水生動物生理學專論 Advanced Topics on Animal Physiology in Aquaculture	2	2				
藥理學特論 Advanced Pharmacology	2	2				
傳染病免疫機轉特論(1) Special Topics on mechanisms of host immunity to infectious diseases 1	3	3				
水生動物疾病學專論 Advanced Topics in Clinical Aquatic Animal Diseases	2	2				
魚類免疫學特論(1) Special Topics on Fish Immunology 1	2	2				
專題研究(2) Independent Studies 2	1		1			
水生植物繁養殖專論 Advanced Topics on Aquatic Plants Cultivation	2		2			

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
魚類多樣性專論 Advanced Topics on the Diversity of Fishes	3		3			
實驗設計與生統分析 Experimental Designs and Biostatistical Analysis	2		2			
實驗設計與生統分析實習 Experimental Designs and Biostatistical Analysis Lab.	1		1			
水產生物分子育種 Aquatic Organism Molecular Breeding	2		2			
魚病臨床微生物學 Clinical Microbiology for Fish Disease	2		2			
生物電子顯微鏡技術特論 Advanced Bio. Electron Microscopy	2		2			
魚用疫苗學專論 Advanced Topics on Fish Vaccinology	2		2			
分子診斷學專論 Advanced Topics on Molecular Diagnostics	2		2			
魚用診斷試劑開發 Development of Diagnostic Reagents for Fishes	2		2			
水生動物疾病診療實習(1) Aquatic Animal Diseases (I)	1		1			
市場行銷 Marketing Management	2		2			
談判與溝通 Negotiation Strategies and Tactics for Business	2		2			
水生動物疾病學特論 Special Topic on Clinical Aquatic animal Diseases	2		2			
魚用疫苗製造與應用 Fish vaccine production and application	2		2			
魚病與營養免疫 Fish diseases and nutrition immunity	2		2			
專題研究(3) Independent Studies 3	1			1		
服務業行銷與管理專論 Service Marketing and Management Seminar	2			2		

中 文 科 目 名 稱 英	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
魚類分子系統分類學專論 Advanced Topics on Molecular Systematics of Fishes	2			2		
觀賞魚飼料配方與機能性飼料 Diet Formulation and Functional Feed for Ornamental Fishes	2			2		
活魚運輸 Live Fish Transportation	2			2		
養殖器材與系統設計專論 Advanced Topics on Facility and System Design for Aquaculture	2			2		
基因轉殖動物專論 Advanced Topics on Animal Transgenesis	2			2		
魚用疫苗開發 Fish Vaccines Development	2			2		
水生動物生產醫學 Aquatic Animal Production Medicine	2			2		
水生動物疾病診療實習(2) Aquatic Animal Diseases (II)	1			1		
國際農業發展趨勢特論 Special Topics on Development Trends of International Agriculture	4			4		
傳染病免疫機轉特論(2) Special Topics on mechanisms of host immunity to infectious diseases 2	3			3		
魚類免疫學特論(2) Special Topics on Fish Immunology 2	2			2		
進階魚用疫苗開發(1) Advanced Fish Vaccines Development 1	2			2		
海洋生物技術 Marine Biotechnology	2			2		
專題研究(4) Independent Studies 4	1				1	
觀賞魚產業實習 Practice in Ornamental Fish Industry	1				1	
觀賞魚產業海外實習 Oversea Practice in Ornamental Fish Industry	1				1	
農業政策與經濟特論 Special Topics on Agriculture Policies and Economics	4				4	

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
傳染病免疫機轉特論(3) Special Topics on mechanisms of host immunity to infectious diseases 3	3				3	
進階魚用疫苗開發(2) Advanced Fish Vaccines Development 2	2				2	
合 計	104	29	32	31	12	

觀賞魚科技國際學位專班 博士班

(一)教育目標

1.以「專業化」、「國際化」、「全人化」為方向，以培育卓越且理論與實務兼備的觀賞魚產業高階專業人才為目標。

(二)必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
專題討論(1) Seminar 1	1	1				
專題討論(2) Seminar 2	1		1			
專題討論(3) Seminar 3	1			1		
專題討論(4) Seminar 4	1				1	
專題研究(1) Independent Studies 1	2	2				
專題研究(2) Independent Studies 2	2		2			
博士論文 Dissertation	12			6	6	
合 計	20	3	3	7	7	

(三) 選修科目

中 文 科 目 名 稱 英	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
觀賞魚餌料生物培養技術特論 Special Topics of Live Food Culture in Ornamental Fish	2	2				
養殖環境管理與永續利用特論 Special Topics on Sustainable Aquaculture Management	2	2				
魚類免疫學特論(1) Special Topics on Fish Immunology 1	2	2				
傳染病免疫機轉特論(1) Special Topics on mechanisms of host immunity to infectious diseases 1	3	3				
進階魚用疫苗開發(1) Advanced Fish Vaccines Development 1	2	2				
觀賞魚繁殖養殖學特論(1) Special Topics on Ornamental Fish Culture 1	2	2				
水生動物疾病學特論 Special Topic on Clinical Aquatic Animal Diseases	2	2				
魚用疫苗開發 Fish Vaccines Development	2	2				
觀賞魚飼料配方與機能性飼料特論 Special Topics on Diet Formulation and Functional Feed for Ornamental Fishes	2		2			
觀賞魚繁殖養殖學特論(2) Special Topics on Ornamental Fish Culture 2	2		2			
整合行銷管理專論 Integrated Marketing and Management Seminar	2		2			
基因轉殖動物特論 Special Topics on Animal Transgenesis	2		2			
進階魚用診斷試劑開發 Advanced Development of Diagnostic Reagents for Fishes	2		2			
水生動物生產醫學特論 Aquatic Animal Production Medicine(I)	2		2			
談判與溝通 Negotiation Strategies and Tactics for Business	2		2			
魚用疫苗製造與應用 Fish vaccine production and application	2		2			

中 文 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		備 註
		上	下	上	下	
魚病與營養免疫 Fish diseases and nutrition immunity	2		2			
魚用診斷試劑開發 Development of Diagnostic Reagents for Fishes	2		2			
水產生物技術應用專論 Advanced Topics on Application of Biotechnology in Aquaculture	2		2			
專題研究(3) Independent Studies 3	2			2		
觀賞魚養殖經濟與經營管理 Special Topics on Economics and Management in Ornamental Fish Industry	2			2		
活魚運輸 Live Fish Transportation	2			2		
觀賞魚繁殖養殖學特論(3) Special Topics on Ornamental Fish Culture 3	2			2		
養殖器材與系統設計特論 Special Topics on Facility and System Design for Aquaculture	2			2		
國際農業發展趨勢特論 Special Topics on Development Trends of International Agriculture	4			4		
傳染病免疫機轉特論(2) Special Topics on mechanisms of host immunity to infectious diseases 2	3			3		
魚類免疫學特論(2) Special Topics on Fish Immunology 2	2			2		
進階魚用疫苗開發(2) Advanced Fish Vaccines Development 2	2			2		
海洋生物技術 Marine Biotechnology	2			2		
專題研究(4) Independent Studies 4	2				2	
農業政策與經濟特論 Special Topics on Agriculture Policies and Economics	4				4	
傳染病免疫機轉特論(3) Special Topics on mechanisms of host immunity to infectious diseases 3	3				3	
合 計	71	17	22	23	9	

觀賞魚科技國際學位專班 碩士班

International Program in Ornamental Fish Science and Technology

選修科目 Required Courses

傳染病免疫機轉特論(1) 3 選 張永富

本課程旨在講述病毒、細菌、原蟲、蠕蟲對宿主所引起之免疫反應及宿主對上述之免疫防禦機轉。病原體如何逃避宿主免疫系統之辨認、攻擊之策略。由此瞭解病原體之免疫學之特性，以茲提供傳染病防治之道。

Special Topics on mechanisms 3 S of host immunity to infectious diseases 1

The host immunity to pathogens, including virus, bacteria, protozoa and helminthes as well, are concerned. Particularly, the mechanism of immunological defense of host cells against an attack due to adhesion, invasion and damages by pathogens. In view of immunopathology, the strategies of escape mechanisms performed by pathogens will be discussed in this course, so that the prevention from infectious disease will be mentioned also.

傳染病免疫機轉特論(2) 3 選

本課程旨在講述病毒、細菌、原蟲、蠕蟲對宿主所引起之免疫反應及宿主對上述之免疫防禦機轉。病原體如何逃避宿主免疫系統之辨認、攻擊之策略。由此瞭解病原體之免疫學之特性，以茲提供傳染病防治之道。

Special Topics on mechanisms 3 S of host immunity to infectious diseases 2

The host immunity to pathogens, including virus, bacteria, protozoa and helminthes as well, are concerned. Particularly, the mechanism of immunological defense of host cells against an attack due to adhesion, invasion and damages by pathogens. In view of immunopathology, the strategies of escape mechanisms performed by pathogens will be discussed in this course, so that the prevention from infectious disease will be mentioned also.

傳染病免疫機轉特論(3) 3 選

本課程旨在講述病毒、細菌、原蟲、蠕蟲對宿主所引起之免疫反應及宿主對上述之免疫防禦機轉。病原體如何逃避宿主免疫系統之辨認、攻擊之策略。由此瞭解病原體之免疫學之特性，以茲提供傳染病防治之道。

Special Topics on mechanisms 3 S of host immunity to infectious diseases 3

The host immunity to pathogens, including virus, bacteria, protozoa and helminthes as well, are concerned. Particularly, the mechanism of immunological defense of host cells against an attack due to adhesion, invasion and damages by pathogens. In view of immunopathology, the strategies of escape

mechanisms performed by pathogens will be discussed in this course, so that the prevention from infectious disease will be mentioned also.

魚類免疫學特論(1) 2 選

本課程著重講解魚類免疫學概念與原理及其應用，主要包含免疫反應之生物學理論、免疫對抵抗傳染病之重要性及由免疫現象引起之免疫疾病等三大項目。

Special Topics on Fish 2 S

Immunology 1

The main objective of this course is to provide detailed knowledge on the recent advances in fish and shellfish immunology. The following topics will be discussed:

- [1]Basic Principles & Overview of Immunity;
- [2]Cardinal signs of immune system.
- [3]Cellular Interactions in the Immune System;
- [4]Mucosal Immunity;
- [5]Evasion of the Immune Response by Pathogens.
- [6]T Cell Activation and differentiation; B Cell Activation and differentiation;
- [7]Antigen Processing and Presentation.
- [8]Classical and alternate Pathway of Complement and their regulation.

魚類免疫學特論(2) 2 選

本課程著重講解魚類免疫學概念與原理及其應用，主要包含免疫反應之生物學理論、免疫對抵抗傳染病之重要性及由免疫現象引起之免疫疾病等三大項目。

Special Topics on Fish 2 S

Immunology 2

The main objective of this course is to provide detailed knowledge on the recent advances in fish and shellfish immunology. The following topics will be discussed:

- [1]Basic Principles & Overview of Immunity;
- [2]Cardinal signs of immune system.
- [3]Cellular Interactions in the Immune System;
- [4]Mucosal Immunity;
- [5]Evasion of the Immune Response by Pathogens.
- [6]T Cell Activation and differentiation; B Cell Activation and differentiation;
- [7]Antigen Processing and Presentation.
- [8]Classical and alternate Pathway of Complement and their regulation.

水生動物疾病學特論 2 選

本課程講述較深入的水生動物疾病知識尤其著重於發生於臺灣的疾病。內容包括個別疾病之致病因子、致病機序及控制方法。本課程亦介紹最新的水生動物疾病診斷及控制技術，如分子診斷技術、DNA 疫苗、新的生物製劑及增進群體健康的新方法等。

Special Topic on Clincial 2 S

Aquatic animal Diseases

This course is to understand the life cycle of pathogens and mechanisms of survival in host cells and

diseases in aquaculture, how to enumerate micro-organisms, methodologies to prevent and cure microbial diseases and to handle, manipulate and sampling fish.

進階魚用疫苗開發(1) 2 選

本課程將針對外來抗原的免疫反應機制和免疫系統進行討論。包括 1) 水生動物的免疫系統。2) 非特異性免疫系統。3) 特異性免疫系統。4) 免疫系統自然變化。5) 影響魚類健康的環境因素。6) 免疫調節。7) 水生動物的疫苗製備。8) 水生動物的疫苗的應用。

Advanced Fish Vaccines Development 1 2 S

The objective of this course is to learn the concepts of vaccination and the latest trends in fish vaccination. Following units will be introduced:

- 1)General principles of vaccination and vaccination strategies in aquaculture. Influence of environmental parameters on vaccination.
- 2)Types of vaccines- killed, live attenuated, synthetic peptide, recombinant, anti-idiotypic, DNA and RNAi based vaccines. Monovalent and polyvalent vaccines. Nanoparticle based vaccines.
- 3)Vaccine production, quality control, vaccine composition, adjuvants and immunostimulants.
- 4)Immunization against bacterial, viral pathogens and parasites.
- 5)Vaccination failure and adverse effects of vaccination.

進階魚用疫苗開發(2) 2 選

本課程將針對外來抗原的免疫反應機制和免疫系統進行討論。包括 1) 水生動物的免疫系統。2) 非特異性免疫系統。3) 特異性免疫系統。4) 免疫系統自然變化。5) 影響魚類健康的環境因素。6) 免疫調節。7) 水生動物的疫苗製備。8) 水生動物的疫苗的應用。

Advanced Fish Vaccines Development 2 2 S

The objective of this course is to learn the concepts of vaccination and the latest trends in fish vaccination. Following units will be introduced:

- 1)General principles of vaccination and vaccination strategies in aquaculture. Influence of environmental parameters on vaccination.
- 2)Types of vaccines- killed, live attenuated, synthetic peptide, recombinant, anti-idiotypic, DNA and RNAi based vaccines. Monovalent and polyvalent vaccines. Nanoparticle based vaccines.
- 3)Vaccine production, quality control, vaccine composition, adjuvants and immunostimulants.
- 4)Immunization against bacterial, viral pathogens and parasites.
- 5)Vaccination failure and adverse effects of vaccination.

魚用疫苗製造與應用 2 選

本課程的目的是教魚類疫苗的生產技術。課程內容包括各種魚類疫苗的製備，疫苗之安全性，有效性評估及申請上市法規與步驟。

Fish vaccine production and application 2 S

The purpose of this course is to understand the recent production techniques for fish vaccines. Course contents include the preparation of various types of fish vaccines, application procedure for the legal approval vaccines, legalization experiments, biosafety and regulatory requirements for fish vaccines etc.

魚病與營養免疫

2 選

本課程的目的是教導魚類疾病和營養免疫力。課程內容包括疾病對水產養殖系統的影響、魚類重要細菌病原體、魚類的重要病毒病原體、抗體診斷、分子診斷、魚的免疫反應概述、免疫反應的宿主病原體相互作用調節劑、測定魚類免疫反應的方法、疾病控制、疫苗策略和疫苗開發、益生菌和功能性飼料之開發與應用。

Fish diseases and nutrition immunity

2 S

The purpose of this course is to teach the fish disease and nutrition immunity. Course contents include the impact of disease on aquaculture systems, important bacterial pathogens of fish, important viral pathogens of fish, antibody-based diagnostics, molecular-based diagnostics, overview of the immune response of fish, host pathogen interactions modulators of the immune response, methods of measuring the immune response of fish, experimental; design disease control in an aquaculture setting, vaccine strategies and vaccine development, the role of fish nutrition in fish health functional feeds, pre and probiotics, and functional feeds immunostimulants.

海洋生物技術

2 選

本課程旨在探討水產生物技術在生物資訊、重組 DNA、蛋白質的生產和免疫診斷測試的發展，尤其注重於養殖相關品種和問題。重點是旨在使學生能在廣泛的領域具應用生物技術的實踐經驗。

Marine Biotechnology

2 S

The aim of the Aquaculture Biotechnology is to provide in-depth training in bioinformatics, recombinant DNA, protein production, and development of immunodiagnostic tests with a particular focus on species and issues with relevance to aquaculture. The emphasis is on hands-on experience designed to equip students with the confidence of applying biotechnology in a wide range of areas.

觀賞魚科技國際學位專班 博士班

International Program in Ornamental Fish Science and Technology

選修科目 Required Courses

傳染病免疫機轉特論(1)

3 選

張永富

本課程旨在講述病毒、細菌、原蟲、蠕蟲對宿主所引起之免疫反應及宿主對上述之免疫防禦機轉。病原體如何逃避宿主免疫系統之辨認、攻擊之策略。由此瞭解病原體之

免疫學之特性，以茲提供傳染病防治之道。

Special Topics on mechanisms of host immunity to infectious diseases 1 3 S

The host immunity to pathogens, including virus, bacteria, protozoa and helminthes as well, are concerned. Particularly, the mechanism of immunological defense of host cells against an attack due to adhesion, invasion and damages by pathogens. In view of immunopathology, the strategies of escape mechanisms performed by pathogens will be discussed in this course, so that the prevention from infectious disease will be mentioned also.

傳染病免疫機轉特論(2) 3 選

本課程旨在講述病毒、細菌、原蟲、蠕蟲對宿主所引起之免疫反應及宿主對上述之免疫防禦機轉。病原體如何逃避宿主免疫系統之辨認、攻擊之策略。由此瞭解病原體之免疫學之特性，以茲提供傳染病防治之道。

Special Topics on mechanisms of host immunity to infectious diseases 2 3 S

The host immunity to pathogens, including virus, bacteria, protozoa and helminthes as well, are concerned. Particularly, the mechanism of immunological defense of host cells against an attack due to adhesion, invasion and damages by pathogens. In view of immunopathology, the strategies of escape mechanisms performed by pathogens will be discussed in this course, so that the prevention from infectious disease will be mentioned also.

傳染病免疫機轉特論(3) 3 選

本課程旨在講述病毒、細菌、原蟲、蠕蟲對宿主所引起之免疫反應及宿主對上述之免疫防禦機轉。病原體如何逃避宿主免疫系統之辨認、攻擊之策略。由此瞭解病原體之免疫學之特性，以茲提供傳染病防治之道。

Special Topics on mechanisms of host immunity to infectious diseases 3 3 S

The host immunity to pathogens, including virus, bacteria, protozoa and helminthes as well, are concerned. Particularly, the mechanism of immunological defense of host cells against an attack due to adhesion, invasion and damages by pathogens. In view of immunopathology, the strategies of escape mechanisms performed by pathogens will be discussed in this course, so that the prevention from infectious disease will be mentioned also.

魚類免疫學特論(1) 2 選

本課程著重講解魚類免疫學概念與原理及其應用，主要包含免疫反應之生物學理論、免疫對抵抗傳染病之重要性及由免疫現象引起之免疫疾病等三大項目。

Special Topics on Fish Immunology 1 2 S

The main objective of this course is to provide detailed knowledge on the recent advances in fish and shellfish immunology. The following topics will be discussed:

- [9]Basic Principles & Overview of Immunity;
- [10]Cardinal signs of immune system.
- [11]Cellular Interactions in the Immune System;
- [12]Mucosal Immunity;
- [13]Evasion of the Immune Response by Pathogens.
- [14]T Cell Activation and differentiation; B Cell Activation and differentiation;
- [15]Antigen Processing and Presentation.
- [16]Classical and alternate Pathway of Complement and their regulation.

魚類免疫學特論(2) 2 選

本課程著重講解魚類免疫學概念與原理及其應用，主要包含免疫反應之生物學理論、免疫對抵抗傳染病之重要性及由免疫現象引起之免疫疾病等三大項目。

Special Topics on Fish 2 S

Immunology 2

The main objective of this course is to provide detailed knowledge on the recent advances in fish and shellfish immunology. The following topics will be discussed:

- [9]Basic Principles & Overview of Immunity;
- [10]Cardinal signs of immune system.
- [11]Cellular Interactions in the Immune System;
- [12]Mucosal Immunity;
- [13]Evasion of the Immune Response by Pathogens.
- [14]T Cell Activation and differentiation; B Cell Activation and differentiation;
- [15]Antigen Processing and Presentation.
- [16]Classical and alternate Pathway of Complement and their regulation.

進階魚用疫苗開發(1) 2 選

本課程將針對外來抗原的免疫反應機制和免疫系統進行討論。包括 1) 水生動物的免疫系統。2) 非特異性免疫系統。3) 特異性免疫系統。4) 免疫系統自然變化。5) 影響魚類健康的環境因素。6) 免疫調節。7) 水生動物的疫苗製備。8) 水生動物的疫苗的應用。

Advanced Fish Vaccines 2 S

Development 1

The objective of this course is to learn the concepts of vaccination and the latest trends in fish vaccination. Following units will be introduced:

- 6)General principles of vaccination and vaccination strategies in aquaculture. Influence of environmental parameters on vaccination.
- 7)Types of vaccines- killed, live attenuated, synthetic peptide, recombinant, anti-idiotypic, DNA and RNAi based vaccines. Monovalent and polyvalent vaccines. Nanoparticle based vaccines.
- 8)Vaccine production, quality control, vaccine composition, adjuvants and immunostimulants.
- 9)Immunization against bacterial, viral pathogens and parasites.
- 10)Vaccination failure and adverse effects of vaccination.

進階魚用疫苗開發(2) 2 選

本課程將針對外來抗原的免疫反應機制和免疫系統進行討論。包括 1) 水生動物的免疫系統。2) 非特異性免疫系統。3) 特異性免疫系統。4) 免疫系統自然變化。5) 影響魚類健康的環境因素。6) 免疫調節。7) 水生動物的疫苗製備。8) 水生動物的疫苗的應用。

Advanced Fish Vaccines 2 S

Development 2

The objective of this course is to learn the concepts of vaccination and the latest trends in fish vaccination. Following units will be introduced:

- 6) General principles of vaccination and vaccination strategies in aquaculture. Influence of environmental parameters on vaccination.
- 7) Types of vaccines- killed, live attenuated, synthetic peptide, recombinant, anti-idiotypic, DNA and RNAi based vaccines. Monovalent and polyvalent vaccines. Nanoparticle based vaccines.
- 8) Vaccine production, quality control, vaccine composition, adjuvants and immunostimulants.
- 9) Immunization against bacterial, viral pathogens and parasites.
- 10) Vaccination failure and adverse effects of vaccination.

魚用疫苗開發 2 選

本課程的目的是教魚類疫苗的生產技術。課程內容包括各種魚類疫苗的準備，在法律許可的疫苗應用程序，法制化的實驗等。

Fish Vaccines Development 2 S

The purpose of this course is to understand the recent production techniques for fish vaccines. Course contents include the preparation of various types of fish vaccines, application procedure for the legal approval vaccines, legalization experiments, biosafety and regulatory requirements for fish vaccines etc.

水產生物技術應用專論 2 選

本課程旨在探討水產生物技術在生物資訊、重組 DNA、蛋白質的生產和免疫診斷測試的發展，尤其注重於養殖相關品種和問題。重點是旨在使學生能在廣泛的領域具應用生物技術的實踐經驗。

Advanced Topics on Application 2 S

of Biotechnology in Aquaculture

The aim of the Aquaculture Biotechnology is to provide in-depth training in bioinformatics, recombinant DNA, protein production, and development of immunodiagnostic tests with a particular focus on species and issues with relevance to aquaculture. The emphasis is on hands-on experience designed to equip students with the confidence of applying biotechnology in a wide range of areas.

魚用診斷試劑開發 2 選

近年來許多新穎的水產動物疾病分子診斷工具被利用來偵測病原菌,以幫助水產養殖動物的健康管理,以及水產環境的生物安全措施的執行,有助於提高養殖成功率及產量.本課程將介紹這些分子診斷工具的發展原理,發展過程及應用,包括微生物方法、免疫分析法、

PCR、同溫核酸擴大方法(如 LAMP 及 RPA)、及生物晶片。

Development of Diagnostic Reagents for Fishes 2 S

Novel molecular diagnostic tools have been available for the detection of aquatic animal pathogens in recent years. These tools could be used to help health management of aquaculture animals and facilitate the implementation of biosecurity measures, improving the survival rates and yields of the culture animals. This course will introduce the principles, development process, and applications of these diagnostic tools, including microbial methods, immunoassays, PCR methods, isothermal nucleic acid amplification methods (e.g. loop-mediated nucleic acid amplification (LAMP) and recombinase polymerase amplification methods (RPA)), and bio-chips.

魚用疫苗製造與應用 2 選

本課程的目的是教魚類疫苗的生產技術。課程內容包括各種魚類疫苗的製備，疫苗之安全性，有效性評估及申請上市法規與步驟。

Fish vaccine production and application 2 S

The purpose of this course is to understand the recent production techniques for fish vaccines. Course contents include the preparation of various types of fish vaccines, application procedure for the legal approval vaccines, legalization experiments, biosafety and regulatory requirements for fish vaccines etc.

魚病與營養免疫 2 選

本課程的目的是教導魚類疾病和營養免疫力。課程內容包括疾病對水產養殖系統的影響、魚類重要細菌病原體、魚類的重要病毒病原體、抗體診斷、分子診斷、魚的免疫反應概述、免疫反應的宿主病原體相互作用調節劑、測定魚類免疫反應的方法、疾病控制、疫苗策略和疫苗開發、益生菌和功能性飼料之開發與應用。

Fish diseases and nutrition immunity 2 S

The purpose of this course is to teach the fish disease and nutrition immunity. Course contents include the impact of disease on aquaculture systems, important bacterial pathogens of fish, important viral pathogens of fish, antibody-based diagnostics, molecular-based diagnostics, overview of the immune response of fish, host pathogen interactions modulators of the immune response, methods of measuring the immune response of fish, experimental; design disease control in an aquaculture setting, vaccine strategies and vaccine development, the role of fish nutrition in fish health functional feeds, pre and probiotics, and functional feeds immunostimulants.

海洋生物技術 2 選

本課程旨在探討水產生物技術在生物資訊、重組 DNA、蛋白質的生產和免疫診斷測試的發展，尤其注重於養殖相關品種和問題。重點是旨在使學生能在廣泛的領域具應用生物技術的實踐經驗。

Marine Biotechnology 2 S

The aim of the Aquaculture Biotechnology is to provide in-depth training in bioinformatics, recombinant DNA, protein production, and development of immunodiagnostic tests with a particular focus on species and issues with relevance to aquaculture. The emphasis is on hands-on experience designed to equip students with the confidence of applying biotechnology in a wide range of areas.

105-2 學期教師申請開授通識課程通過中英文課程大綱

西洋文學概論

本課程將介紹西方重要的文學經典作品，將從西方文明的兩個重要源頭開始談起，首先介紹希臘文化中最具代表性的希臘羅馬神話故事以及著名的荷馬史詩、希臘悲、喜劇，繼而介紹希伯來文化的代表《聖經》，接著帶領學生賞析中世紀與文藝復興時期歐洲文學的經典，包括但丁的《神曲》、塞萬提斯的《唐吉訶德》以及莎士比亞的戲劇。

Introduction to Western Literature

This course aims to introduce students to canons of the West, starting with Greek mythologies, tragedies, comedies, and Homer's epics. After having a brief glimpse at the marvels of Hellenic culture, students will have access to the two representative works of Hebraism and the most influential works to Western civilization, that is, *the Old Testament* and *the New Testament*. Masterpieces from the Middle Age and the Renaissance such as *The Divine Comedy*, *Don Quixote*, and William Shakespeare's sonnets will also dazzle the students with their insights into life journey, medieval chivalry, and poetic art.

性別、身體與勞動

在注重知識論辨的社會學或哲學場域裡，身體的經驗或女性身體的經驗向來不是社會學家探討的重點，身心二元對立的啟蒙傳統更使得身體的社會意涵時常被忽略，及至 1990 年代起，「身體」開始成為社會學家關注的焦點，性別化的身體、醫療化的身體、承載歧視污名的身體、勞動的身體等等開始成為研究主題。進入後工業時代之後，勞動的身體也從原本的工業勞動轉變成為再生產或文化的身體，打造個人身體意象更成為不同行業的重要前提。本課程欲透過運動、醫療、美妝、工薪、照顧工作等不同面向來探討「身體」在當代社會的象徵意涵，藉此喚起知識與身體經驗的連結，進而看見日常生活中看得見或看不見的各種勞動身影。從不同面向探討身體的社會意象與社會意涵方能引發思考，特定的社會文化對於身體、美貌的要求，更能進一步探討各種圍繞著身體的歧視和偏見，乃至於對於特定的勞動行業延伸出的歧視。本課程的目的在於引發思辨以消弭歧視偏見，讓各種形貌的身體（不分胖瘦、健全殘缺、男性女性、年輕衰老等）皆能自在舒適地生活於社會當中，也讓各種行業的勞動身影能被看見被尊重。

Gender, Bodies, and Works

Bodily experiences have long been neglected in disciplines such as sociology and philosophy due to the duality of body and mind since the Enlightenment. It was not until the 1990s did sociologist and feminists started to discuss "bodies" and "bodily experiences." This course aims to explore "bodies" from various perspectives such as sports, medical system, cosmetic industry, industry, care work. Discussions and examples from different perspectives enable the students to reflect on their bodily experiences and to appreciate all types of bodies they encountered in their everyday life. The purpose of this course is to eliminate discriminations and biases through the discussions of the social meanings embedded on different types of bodies.

數位社會與全球公民

1990 年代之的網際網路世界開始形塑新的媒體地景，隨著行動網路發達，唯機族逐漸成為趨勢。跨地域、即時性、互動性加速資訊傳遞的時間，也擴大資訊傳遞的範圍，媒體

話語權不在掌握於政治菁英或媒體菁英手中，資通設備的便捷搭配各式自媒體平台促成數位時代的直接公民參與形式，也促成不同形式的娛樂經濟和創業模式。數位世代的公民藉由網路能更快速參與全球議題，也能夠藉由各種網路平台及數位科技進行實質動員，改變既有的企業型態或政治樣貌。本課程將探討當今全球化的數位社會下跨國公民參與各項行動的潛力與未來發展，課程第一部份將探討網路作為公共領域的可能性及限制，並從而思考網路空間的公共性與私密性，由此鋪陳出全球化數位時代的市民社會樣貌及數位公民應具備之數位素養。第二部分則透過各國的案例來探討民意、政治、宗教、性別、環境、娛樂、創業等議題，拓展國際化視野之餘更融入不同的社會議題，以瞭解數位時代的社會變遷及型貌。

Digital Societies and Global Citizens

The development of digital technologies has greatly changed the landscape of media. With the convenience of the Internet and portable devices, elite politicians and media elites are no longer in total control of media. Multimedia platforms enable extra-local, interactive, and intermediate participants for the citizens who now are labeled as netizens. This course aims at exploring the way in which a globalized network enables netizens to participate, to change, to act in the digital age.

快速成功學

成功學即是管理學，管理者要為成功找方法，不要為失敗找理由，此方法即是「成功學」；沒上過成功學課程，並不影響你成為一個成功的管理人，但若有機會學習他人的成功經驗及理論，則可縮短很多學習及摸索的時間，本課是現今為管理者或有志成為成功者者必上的課程。要成功，主要是靠獨立思考、經驗及努力，日本經營之神松下幸之助只有小學畢業，被譽為台灣經營之神的王永慶只讀小學二年，全世界最有錢的美國比爾蓋茲只唸到大學二年級，他們在創企業之前，並未上過成功學。本課程應用獨創的「啟發性管理學習法」，應用啟發性的故事來說明成功理論；不敢說本課程有如仙丹般的妙用，但對嚮往成功者不無補神養氣之效，就算只聽近三百則深具啟發性的管理說明，就已值得來上課了。

Double Quick Success

This course is inspiring, interesting, useful and easy to learn to help students to be happy learning how to be a winner. The teacher has undertaken practice work in the business world more than 13 years, been as a professor of business administration management more than 22 years and all the experience make me deeply understand that a success person basically rely on independent thinking, experience and effort. Managers have to find methods for success, not to find excuses for failure. Never having success course does not affect you become a successful manager, but if you have the chance to learn other people's success experience and theory, it can shorten the time a lot for learning and groping. Experience is the best teacher, but tuition, time and energy is too expensive. I believe that this course is a necessary required course for managers or people seeking to become success. This course is considered with practical use and hope that student can enjoy learning. Can't say the course has a magical function as an elixir, but it is vital to student's spirit. It is worth to take this course even if only listen to more than 300 success wisdoms. The course puts emphasis on practical philosophy, anything no use, no good will be abandoned. As what Deng Xiaoping said "no matter black cat or white cat, it will be good cat as long as it can catch mice". Try to find simple story and allusions to inspire the correct understanding of the concept of success. This course is the first course to teach with inspiring story in Taiwan.

科學傳播概論

科學研究透過各式媒體的傳播，使人可以認知、體會並適切地在生活中應用。本課程旨於激發學生對科學傳播的內涵與興趣，體會社會的科學教育重要性，並透過傳播理論與經驗，看見國民對科學的認知、應用及發展重要性。本課程之目的乃使學生：(1)認識科學傳播特性與內涵，對於國內、外學傳播理論在科學領域的運用(2)透過新聞、廣播、節目、網站、平面印刷等科學內容，進行分享、評析，以了解媒體的特性與科學傳播功能(3)由文章閱讀及影片介紹，對科學研發及知識教育之見解擴充與思辯能力(4)藉著分組專題研究與報告，提升團隊合作學習精神與敘述表達之能力並擴充學理之應用能力。培養學生之核心能力部分為：(1)對科學的應用自然科學公民核心能力(2)理解傳播與媒體能力及應用(3)科學倫理素養與思辯能力之認知與培養(4)具有國際視野能力，體會先進國家之科學傳播與應用。(5)積極主動思考與探索之學習態度。

Introduction to Science Communication

Since the development of science is so important and close to us, the science communication is necessary taught and understood. The purpose of this class is to stimulate students to learn the concept, communicating models, media and ethics of science communication. Further, to enhance the cognitive ability about the science news and application in their academic research in future.

Upon completion of this course, students should:

- (1) stimulate the interesting in learning the concept of science communication,
- (2) have knowledge of the history and development of communication science,
- (3) comprehend the characteristics and contents of science communication,
- (4) have knowledge the dominant theories in domain of science communication,
- (5) have understanding the most important models and concepts in this field.

Obtaining these core competencies:

- (1) to owe the cognition of science ethical and ability of speculation,
- (2) to have the global vision about the application in the developed countries,
- (3) to have the active learning attitude in thinking and researching,
- (4) to learn the ability of analyzing the communicating effects about science news.

跨文化溝通

本課程是一門融合「互動社會語言學」(interactional sociolinguistics)、語用學、人類語言學、社會心理學、口語傳播等學科的角度，觀察社會與文化的差異，如何影響人對於語言溝通策略的選擇，以及如何影響論述(discourse)特徵的差異。本課程標題中的「跨文化」並非侷限於不同的國與國之間(種族或東西文化差異)，其他社會因素，例如：性別、階層、年紀、職業或科技等等也包含在內。本課程的學生將有機會透過講課、文獻閱讀與報告、執行小型研究調查，了解社會因素如何影響語言的使用，同時探討種族、年紀、性別等概念，如何被建構(discursively constructed)在語言和溝通的過程中。本課全英授課。

Cross-cultural communication

1. To help our students develop better communication competence for their future career involving interacting with people from other cultural or social backgrounds or even for their future pursuit of advanced study abroad.

2. To help students to have greater awareness of cultural differences in various communication contexts.
3. To learn the fundamental notions covered in the study of intercultural communication.

This course is meant to be an all-English course, inviting overseas students to be enrolled to help create a naturally cross-cultural contexts for all students with different cultural background to discuss and understand each others' cultural diversity in relation to communication patterns and strategies. Cross-cultural communication is defined not only by national diversity but also social diversity as derived from gender as well as various communication contexts, such as conflicts, media, business and education. Students will be given lecture to have initial understanding important theories and concepts in cross-cultural communication and eventually put what they know into practice in the future when they have to communicate with people from different social and cultural backgrounds. Their awareness and sensitivity as to how to use language with polite and adequate manners are expected to increase upon the completion of the course.

語言與社會互動

本課程旨在幫助學生了解不同的生活與社會互動情境中，人的語言與溝通行為的不同樣貌。語言是人際互動與關係維護的基礎，透過理解不同情境下的各種溝通行為模式，可以幫助學生理解自身語言對於社會與互動產生的影響，並減少衝突與誤解的產生。本課程將針對幾項特定的情境與社會因素，如性別、年齡、愛情、政治、職場與網路，進一步探討和我們語言行為的關聯。

Language and Social Interactions

Learning communication skills as to how to interact with others in the given society is very important for students now and then. Language plays the central part for the success of maintaining good relationships with others in our daily lives. Without proper awareness of politically correct language use or how language works to make our social interactions smooth, even though students are equipped with good professional knowledge, it is still likely that their careers as well as their study experiences will be compromised due to failures in maintaining good relationships with people around them in different contexts. Given the above, this course is provided and with a number of purposes as stated below:

1. students would have greater awareness of language choices made for different communicative situations and the possible consequences.
2. students would understand the bases on which misunderstanding or mis-communication occur.
3. students get o explore the connections between language use and gender, age, romantic relationships, politics, workplace and the cyber
4. students can increase their understanding of the roles language play in social interactions

Lectures would cover simple conceptual framework to help student understand connections between language behaviors we show on the daily basis and the impact they have on our social interactions. This could also provide opportunities for students to experience, observe and analyze verbal and nonverbal communication behaviors in different social interactional situations.

輻射與安全

311 日本強震後，造成全球對核能電廠的安全疑慮與輻射外洩的恐慌，台灣核三廠至屏科大直線距離僅有 80 公里，提供正確輻射相關知識與建立適當輻射防護觀念對屏科大

學生都是當務之急。本課程以淺顯易懂的授課內容(案例分析)與方式(參訪核三廠)，讓學生瞭解輻射的基本原理，引入輻射與日常生活的關聯性及應用，進而對輻射建立正確的觀念。課程內容主要針對四個面項做探討：

- 1.輻射的基本原理、種類、來源與特性概述。
- 2.解析輻射檢測方法、防護原理、劑量限值與生物效應等對輻射安全(土壤、水、食品與環境)的影響。
- 3.輻射在醫學、工業、環境、農業、考古與能源方面之應用。
- 4.核電廠的風險與事故案例分析作為輻射災害防救對策與應變措施之演練教材。

『輻射與安全』是讓學生了解輻射的特性與應用的課程，於此同時也週知輻射與生活息息相關，無法避免。希冀透過輻射教育的普及性，讓學生重視如何做好輻射防護、避免輻射傷害，才不會遇到相關問題產生時而慌張失措，最終啟發學生對輻射利弊的省思。

Radiation and Safety

311 Fukushima nuclear disaster caused by global nuclear power plant safety concerns and radiation leak panic. After that, it is imperative to provide proper radiation-related knowledge and establish appropriate radiation protection concepts for students of National Pingtung University of Science and Technology(NPUST) due to the only 80 km straight-line distance from Taiwan Third Nuclear Plant to NPUST. This course will help students understand the basic principles of radiation by making use of the easy-to-follow instructional content and methods. At the same time, the course also introduces the relevance and application of radiation and daily life to establish the correct concept of radiation. The main contents of the course are discussed in four aspects, as following:

1. Basic principles, types, sources and characteristics of radiation.
2. Radiation protection methods, protection principles, dose limits and biological effects on radiation safety, including soil, water, food and the environment.
3. The application of radiation in medicine, industry, environment, agriculture, archeology and energy and so on.
4. Case analysis of risks and accidents in Nuclear Power as a radiation disaster prevention measures and contingency measures of the exercise materials.

"Radiation and Safety" is a course that allows students to understand the characteristics and applications of radiation. At the same time, it also shows that radiation and life are closely related, can not be avoided. Through the popularity of radiation education, so that students attach importance to how to do radiation protection in order to avoid radiation damage. Students will not encounter problems arising from time to time panic and ultimately this course enlightens students on the pros and cons of radiation considerations.

勞工衛生概論

本課程是以在校學生為對象之未來職場導入性學習，內容包括職業場所(包括學校實驗室)中危害辨識、危害評估分析與危害控制改善，並介紹職場衛生作業標準內容與預防性管理方法，以期提早養成學生職場衛生之基本概念及實務。主要課程內容包括四部分：(1) 職業安全衛生法及相關子法介紹、(2) 物理性危害(例如噪音、輻射)與預防性控制(例如聽力評估、聽力防護具)、(3) 化學性危害(例如有機溶劑、缺氧)與預防性控制(例如口罩、防毒面具)、(4) 實驗室安全衛生管理(例如中毒案例分析、氣罩)。

Introduction to Occupational Health

This course is intended to serve the introductory learning for students whose future professional work requires a sound knowledge regarding the fundamentals of occupational health, which include the recognition, evaluation and control of the hazards in the workplace (including

the laboratory at school). Furthermore, the standard operation and preventive management will be also covered in the course to teach the occupational health principles and practices for the students in the early stage. In brief, this course includes the following parts: (1) Introduction to the Occupational Safety and Health Act and related regulations, (2) Physical hazards (including noise and radiation) and their preventive control (including hearing evaluation and preventive equipment), (3) Chemical hazards (including organic solvents and oxygen asphyxiation) and their preventive control (including simple mask and gas mask), and (4) Laboratory safety and health management (including poisoning-case study, hood).

無人載具應用農業實作

本校位於北大武山下，景色優美、綠意盎然，於 2014、2015 年連續兩年榮獲世界綠色大學評比全國第一名。地理資訊系統是近年來發展的一種環境資源管理工具軟體，運用電腦科技來整合各種不同來源的空間資料，如地圖、數值航照、全球定位系統、衛星遙測影像等，可以協助國土相關機構管理環境，輔助擬訂環境政策及監視環境變化，使我們能充分且永續的管理地球資源。本課程首先介紹地理資訊系統的發展、基本操作功能、地理資料庫建置及主題地圖的繪製，使學生了解地理資訊系統的理論基礎及相關應用，透過一人一機的操作使同學能運用這項新的工具軟體，製作簡單的地理資料庫及統計地圖，使學生於修習本課程後能夠理論與實務兼備。本課程主要讓學生利用校園豐富之地貌景觀結合無人飛行載具(UAV)之拍攝，以期從中學習製作景觀影片的技術，並培養人文藝術之美學，及對新興科技發展之了解。期發展農業 UAV 系統可適用於農業自動化、農業環境監測。最終目的為利用發展之農業 UAV 系統做為教學培育「UAV 無人飛行載具於智能農業生產」人才，並以此之前瞻工程技術來推升農業生產力，邁向高效率/效能、安全與降低風險的新農業時代，提升農業生產在國際之競爭力。

Unmanned Aerial Vehicle and Geographical Information System

National Pingtung University Science and Technology (NPUST), located on a hillside in northeastern Neipu Township in Pingtung. Most beautiful campus in the nation. The rank is first of the World Green University during 2014 to 2015. Nowadays, the applications of Geographic Information Systems in non-hakka areas are much more than in hakka areas, so this is value to advance. This course will investigate the cultural industries resources of hakka area deeply, and establish a complete database with a query system through the Geographic Information Systems. This course will integrate the professional extension modules like 3D、Spatial、network、Regional analysis and Image processing technologies. of Academic research deeply, and establish a complete database with a social-economic system and historical map through the Geographic Information Systems. t attempts to help students to use those tools in survey, nature resources investigation, environment, ecological monitor, and disaster first aid. With those technologies they can solve problems more efficient. We try establish UAV relevant courses, and setup UAV student research group. So, This course is designed to enable students to take advantage of campus-rich landscapes and unmanned aerial vehicles (UAV) to learn how to produce landscapes and develop the aesthetics of humanities and the development of new technologies. That includes intelligent automation, and prodution environmental monitoring Via UAV. Our university has really invested in this program to produce more professions to help improve agriculture 4.0.

流域管理與永續環境

受全球氣候變遷影響下，保護河川水資源、改善水質及生物多樣性是流域管理重要的議題。本課程主要協助學生瞭解水資源、生態、經濟、社會、環境等各層面相互關係，並

藉由國內外流域管理案例分析，與校外參訪學習，以期透過本課程培養學生對水資源利用與永續環境的新思維。

Basin Management and Sustainable Environment

Under the influence of global climate change, protecting river water resources, improving water quality and biodiversity are important issues in basin management. This course is designed to help students understand the interrelationships of water resources, ecology, economy, society and environment. Analysis of case study of basin management from references and off-campus teaching. This course is used to train students on the sustainable utilization of water resources and sustainable environmental thinking.

生產力 4.0 概論

本課程主要是訓練修課學生集思廣益、專業分工與跨領域合作能力，讓學生將跨領域學程中自動化、物聯網、大數據分析和智慧技術四個領域的專業理論和實務課程，透過分組討論及報告的方式結合各系專業呈現出來。課程特色是由同學簡報過程中，老師協助指導各組研發團隊相關之研究的題目選定、相關資料蒐集及各種技術跨領域的合作，課程中也邀請跨領域講師演講及經驗分享，達到生產力 4.0 的教學核心目標。

Productivity 4.0

缺

農業生產概論

廣義的農業包括農、林、漁、牧業等四大部門。自然界的生態與環境和農業的關係最密切，此乃因為農業是培育動植物的產業，其本身就是生態與環境的一環。而近年來，生態農業的生產主要是以資源的永續利用和生態環境保護為重要前提，根據生物與環境相協調適應、物種優化組合、能量物質高效率運轉、輸入輸出平衡等原理，運用系統工程方法，依靠現代科學技術和社會經濟信息的輸入組織生產。通過食物鏈網路化、農業廢棄物資源化，充分發揮資源潛力和物種多樣性優勢，建立良性的物質循環體系，促進農業持續穩定發展，實現經濟、社會、生態的最大效益。因此，生態農業是一種知識密集型的現代農業體系，是農業發展的新型模式。因此，本課程主要授課重點如下所示。 1. 介紹台灣農業發展概況 2. 智慧與雲端農業生產科技 3. 氣候變遷對糧食作物生產的影響 4. 農業栽培概論 5. 林業造林生產與木材生產開發 6. 漁業資源概論 7. 畜牧業生產管理概論。

Introduction to Agricultural Production

There are four major fields of Agriculture in Taiwan, such as agriculture, forestry, fishing and animal product industry. The property of agriculture is breed animals and plants, which it is part of the ecology and the environment. In recent years, it is important that the production of agriculture is sustained to use the resources and the environment of nature. According to the principle of biological and environmental co-adaptation, optimization of species, energy functioning efficiently, energy functioning efficiency and balance of input and output, it uses the engineering system, and production is relying on modern science and socio-economic information organization. Through the food chain network and agricultural waste resources, expresses the potential of resources and species diversity, establishes of material recycling system to promote sustainable development and achieves the economic, social and ecological benefits. Ecological agriculture is a knowledge-intensive modern agricultural system. It is a new model of agricultural development. Therefore, the main focus of this course is following: 1. Introduction of Taiwan agricultural development 2. Use of agriculture production technology 3. Impact of climate change on crop production 4. Introduction of Agricultural Cultivation 5. Forestry

production and timber production development 6. Introduction of fishing resources 7. Introduction of Animal Production Management.

農業設施概論

本課程主要教授農業設施的基本知識，包括植物工場與自動控制、農業機械與農業灌溉設施等，課程的核心涵蓋傳統農業設施與未來智慧化生產的可能趨勢。

Introduction to Agricultural Facilities

This course mainly teaches basic knowledge of agricultural facilities, including plant and automatic control, agricultural machinery and irrigation facilities. The core of the course covers the traditional agricultural facilities developed history and future agricultural facilities develop trend.

農業管理概論

本課程乃系統性地介紹一個農企業經理人應具備之技能，包括：(1)農企業管理學內涵(2)農企業經營規劃與決策(3)消息收集與分析(4)預測方法(5)農企業產品與生產規劃(6)農企業資金與預算(7)農企業成本與收益觀念(8)不同評價之成本項目與效益分析(9)農企業行銷(10)農業政策與環保問題(11)農企業組織(12)人力資源(13)農企業控制原則(14)農企業經營目標之設計。

Introduction to Agricultural Management

The course gives a systematic knowledge for agribusiness manager includes as follows🤖
1)The contents of Agribusiness; (2)Planning and Decision; (3)Information collection and Analysis; (4)Forecasting; (5)Products and Production planning; (6)Capital and Budget; (7)Cost and Revenue; (8)Cost evaluation and Benefit analysis; (9)Agribusiness marketing; (10)Agricultural policy and Ecosystem protection; (11)Agribusiness Organization; (12)Manpower Resources; (13)Controlling; (14)Management Indicators.