

## 109 學年度第 2 學期第 1 次 校課程委員會議

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## 各系(所)中心新增課程中英文摘要

### 一、農學院

#### 農食生技企業經營管理特論 2 選

本課程邀請產官學研專家傳授財務報表編制、財務報表分析、制訂經營管理策略、企業經營管理實務等技術，包括會計、管理、產業經濟、商場交易規範及慣例等相關知識之整合等，讓學生充分認識及熟悉企業經營管理的技巧，以強化學生進入職場從事農食生技產業經營管理的競爭力。

#### Special Topics in Administrative Management of Agriculture, Food and Biotechnology Businesses 2 E

In this course, expert speakers from industry, government, university or institute will be invited to share their knowledge and experiences on financial statement preparation, financial statement analysis, business strategy making, business management practice, etc., including integration of relevant knowledge of accounting, management, industrial economy, marketing guidelines and practices, etc. One of objectives is to allow students to apprehend and master the business administration techniques, and promote their competitiveness of business management as they working in agriculture, food or biotechnology industry.

#### 農食生技產品創新研發與推廣實作 2 選

本課程聘請產、官、學、研界之專家，講授農食生技產品創新研發與推廣的方法與技巧，其中包括食品創新設計與創業、創新事業商業模式、創業團隊養成、群眾募資、新產品推廣與行銷等，並依照授課內容，提供學生實作實習或業界參訪之活動，讓學生能將課堂所習之產品創新與推廣之知識與技術，實際動手應用於創業或行銷的運作。

#### Practices of Innovation and Promotion of Agriculture, Food and Biotechnology Products 2 E

In this course, experts from industry, government, university or institute will be invited to teach methods and techniques for innovation, R&D and promotion of agriculture, food and biotechnology products. The topics may include, but not limit to, innovative design and entrepreneurship of food business, business models, entrepreneurial team, crowdfunding, promotion and marketing of new products, etc. In addition to lecture in the classroom, the lecturer will also provide students with hand-on practice in the lab or field trip to visit agriculture, food or biotechnology industry. This course will allow students to utilize the knowledge and techniques learned in classroom for actually hand-on application of innovation and promotion of products in lab.

### (一) 農園生產系：

#### 特藥用作物智慧農業栽培與品質管理實務 3 選

本課程講授特藥用作物之智慧農業栽培與管理現況包含各種感測器、自動化設備，物聯網及大數據，Arduino 應用於滴灌系統等，同時針對特藥用作物材料、半成品及產品之各種萃取技術及應用，內容包括水煎煮萃取、迴流萃取、索氏萃取、水蒸氣蒸餾萃取、超音

波震盪萃取及 CO<sub>2</sub> 超臨界流體萃取等技術之設備及原理的介紹、操作方法、選擇萃取的方式等。在成分單離純化技術及應用，內容包括層析法之分離原理、各種分離材質種類的介紹、管柱層析操作方法、層析方法的選擇等。在高效液相層析法/氣相層析法/(含氣相層析串聯質譜儀)之成分分析技術及應用，內容包括高效液相層析法/氣相層析法的設備、原理及操作方法的介紹、高效液相層析法/氣相層析法分析條件之建立、高效液相層析/氣相層析分析條件之確校試驗及成分定性定量方法等

## **Practice of smart agricultural cultivation and quality management in special and medicinal plants**

### **3 E**

This course will introduce current status of smart agricultural cultivation and management including the application of various sensors, automation equipment, Internet of Things and Big Data, and Arduino controlled drip irrigation system to special and medicinal plants. In addition, techniques of quality management in special and medicinal material, semi-products and products will also be covered. Specific topics are followings: extraction techniques including extraction equipment and theories, operation methods, and determination of extraction methods (water decoction extraction, reflux extraction, Soxhlet extraction, steam distillation extraction, ultrasound shaker, and CO<sub>2</sub> super fluid extraction), column chromatography techniques including chromatographic separation principle, introduction of the various types of separation materials, operating procedure of column chromatography, and selection of chromatographic methods, High Performance Liquid Chromatography and Gas Chromatography (including GC/MS) techniques including equipment of HPLC/GC, principle and operation methods of HPLC/GC, HPLC analysis conditions establishing, HPLC/GC analysis conditions calibration tests, and component quantity and quality analysis methods..

### **(二) 森林系：**

#### **林下經濟實習(微型課程) 0.5 選**

本課程旨為林下經濟一級生產實務操作課程，透過實務操作方式讓學生實地接觸林下經濟產業(包含林下養蜂、林下養菇與林下作物栽培)方式，藉此培養學生投入林下經濟產業須具備的實務技能。課程內容包含：林下養蜂四季管理、蜂產品採收、蕈菇栽培管理、林下作物栽培與馴化等技術。教學方式包括業師授課、案例研討與實務操作。

#### **Practice of Under-forest Economy 0.5 E**

This course aims to provide students with practical and field work experiences on primary production in under-forest economy. For instance, under-forest beekeeping, under-forest mushroom harvesting and other crop cultivation. With these series of contents, students will be familiarized with the techniques that allow them to practically farm in the forest. The course consists of under-forest beekeeping management in different seasons, bee products harvesting, mushroom cultivation management as well as under-forest crop cultivation and domestication. Instructional methods will include lectures from experts with practical experiences, case studies and practical field work

#### **森林農產食品加工安全(微型課程) 0.5 選**

本課程旨為透過講授食品從生產原料，經加工過程、包裝，到消費者食用過程中，食品衛生與安全與食品法規問題，並且結合本校食品科學系 GMP 模擬加工廠，進行實務學習，讓學生學習森林農產品(蜂蜜、金線連、蕈菇等產業)安全食品包裝與加工過程。教學方

式包括業師授課、案例研討與實務操作。

### ***Forest farming food processing and safety* 0.5 E**

In this course, students will be exposed to lectures about an overall supply chain of raw material derivation, processing, packaging, consumption, hygiene & safety, and food regulations, as well as practical work in a simulated GMP food processing plant affiliated with Food Science Department at NPUST. Students will learn knowledges about safe packaging and processing of forest products such as honey, shiitake mushrooms and so on. Instructional methods will include lectures from experts with industrial experiences, case studies and practical work.

### **森林農產品加值(微型課程) 0.5 選**

本課程旨為蜂蠟加工、環境教育設計、花藝設計與食品烘培等技術課程，訓練學生如何將森林農產品(如：蜂蠟蠟筆、養蜂體驗、森林花材)進行各項產品加值工作，課程中激發學生對於森林農產品加值創意，增進部落森林農作產品多樣性。教學方式包括業師授課、案例研討與小組實作。

### ***Value-Adding of Forest farming Products* 0.5 E**

This course consists of technical sections including beeswax processing, environmental education design, floral design, food baking and so on so forth. The course also aims to let students learn how to process forest farming products (for instance, beeswax crayons, beekeeping experience classrooms, forest flowers for raw materials) to create greater added value. In the course, students will be inspired to be innovative on adding more value to forest farming products and to increase the diversity of tribal forest products. Instructional methods will include lectures from industrial experts, case studies and practical work in groups.

### **森林農產行銷(微型課程) 0.5 選**

本課程旨為講授有關行銷管理程序、行銷規劃、產品發展、行銷工作設計等課程，並且透過實務案例分享讓學生具體了解課程內容，再藉由分組方式，讓各組針對目前全台部落森林農產品進行行銷管理規劃，如：分析行銷環境與消費者市場、產業與競爭者分析與產品品牌與包裝之決策與管理、定價決策、行銷通路規劃等。教學方式包括業師授課、案例研討與小組討論。

### ***Marketing on Forest farming Products* 0.5 E**

This course is designed to provide students with procedures of marketing management, marketing planning, product development, and marketing work design. In addition, this course will share practical cases so that the students can understand the content with more specific information on the ground. Through group discussions, students can focus on the current tribal forest products and conduct marketing management planning in Taiwan. The marketing management includes analysis of the marketing environment and consumer market, related industrial and competitor relationship, along with product branding, packaging, pricing, and marketing channel planning, etc. Instructional methods will include lectures from experts with industry experiences, case studies and group discussions.

### **自然資源調查(微型課程) 1 選**

本課程主要針對自然界之物理與化學條件，其中包含非生物與生物資源的調查、評估與調查技術研究方法等進行授課。主要內容包括：一、GIS與製圖 二、遙測資料分析 三、無人載具調查技術 四、土地利用分析 五、氣候與氣象資料搜集 六、木本植物樣區調查 七、自動照相機調查技術。

### ***Natural resources inventory***

**1 E**

This course is mainly aimed at the physical and chemical conditions of nature, including non-biological and biological resources inventory, evaluation and research methods of survey technology. The main contents include: 1. GIS and mapping 2. Remote measurement data analysis 3. Unmanned vehicle survey technology 4. Land use analysis 5. Climate and meteorological data collection 6. Woody plant sample area survey 7. Automatic camera survey technology

### **智慧林業與無人載具之應用**

**2 選**

本課程主要針對智慧林業與無人載具之應用進行說明，其中包括無人飛機、無人多旋翼機、以及無人直升機之應用。主要內容包括：一、空拍製圖 二、遙測資料處理與分析 三、無人載具考照 四、森林經營規劃 五、土地利用判釋 六、大數據分析。

### ***Application of Smart Forestry and Unmanned Aerial Vehicle***

**2 E**

This course is mainly aimed at application of smart forestry and unmanned aerial Vehicle, including drone, multirotor, and helicopter. The main contents include: 1. Aerial photography 2. Remote measurement data processing and analysis 3. License examination of Unmanned Aerial Vehicle 4. Forest management plan 5. Land use interpretation 6. Big data analysis

### **(三) 水產養殖系：**

### **天然機能性物質開發與應用**

**2 選**

水產生物，為台灣重要養殖生物，如魚蝦貝類。養殖過程中，生物體易受外來病原的侵擾，導致生物體的致死率增加。透過免疫調節物質，可有效控制疾病的發生，降低養殖風險。學術研究上，已有多種具有免疫調節功能性物質發表；因此本課程主要設計，講解天然物中所具有之機能性物質，及其功能與純化方式。

### ***Development and Application of Natural Functional Materials***

**2 E**

Aquaculture is the most important commercial behavior in Taiwan, such as fish, shrimps and shellfish culture. During the culture process, aquatic organisms are susceptible to foreign pathogens, leading to the lethality of organisms. To the previous research, through immunomodulatory substances, the fish diseases can be effectively under control and the risk of breeding can be reduced. In academic research, a variety of substances with immunomodulatory functions have been published, therefore, this course is mainly designed to understand the immunomodulatory substances contained in natural products, as well as their functions and purification methods.

### **天然機能性物質開發與應用實習**

**1 選**

水產生物，為台灣重要養殖生物，如魚蝦貝類。養殖過程中，生物體易受外來病原的侵擾，導致生物體的致死率增加。透過免疫調節物質，可有效控制疾病的發生，降低養殖風險。學術研究上，已有多種具有免疫調節功能性物質發表；因此本課程主要設計，講解



天然物中所具有之機能性物質，及其功能與純化方式。

實習課程中主要操作，水生動物細胞培養技術，水草天然物以及大分子多醣類物質萃取方式，並實地操作細胞試驗，學習物質安全性與機能性評估方式。

## **Operation of the Nature Materials Extraction and Function Assessment 1 E**

Aquaculture is the most important commercial behavior in Taiwan, such as fish, shrimps and shellfish culture. During the culture process, aquatic organisms are susceptible to foreign pathogens, leading to the lethality of organisms. To the previous research, through immunomodulatory substances, the fish diseases can be effectively under control and the risk of breeding can be reduced. In academic research, a variety of substances with immunomodulatory functions have been published, therefore, this course is mainly designed to understand the immunomodulatory substances contained in natural products, as well as their functions and purification methods.

The main operations in the internship course is including of the aquatic animal cell culture technology, water extraction of natural products and macromolecular polysaccharide extraction methods, and field to learn material safety and functional evaluation in the cell level.

## **國際水產養殖與飼料產業發展概況 2 選**

本課程提供學生學習全球水產產業概況及產業未來的發展趨勢，進行國際間相關產業的介紹、南向經驗與產業願景分享。從飼料原料採購、整合供應鏈到永續經營進行健康養殖的實務經驗傳承。本課程也將協助同學學習水產養殖飼料產業的重要性及了解目前國際間相關產業的人力需求，並提升學生進入產業的能力。課程內容著重於明瞭飼料業產業在水產養殖產業鏈中所扮演的角色與定位，現今及未來的飼料研發國際趨勢及現場實務經驗傳承等。

## **Introduction in the development of global aquaculture and aquafeed industries 2 E**

This course will provide students an overview of global aquaculture industry and developmental trend of the industry. It will introduce the current status of international industries, southward experience and industrial vision. From the sourcer of feed ingredients, the integration of the supply chain to the sustainable management of the practical experience of healthy farming. The course will also assist our students to learn the importance of aquafeed industry, to understand the current manpower needs of the industry and to enhance students' ability to immerse the industry. The content of the course will focus on the role and positioning of the feed industry in the aquaculture industry chain, the current and future global feed research and development directions and on-site practical experience.

## **魚類營養研究方法專論 2 選**

水產飼料約佔集約養殖生產總成本的 40-60%，飼料最重要的功能是供應魚類營養素的來源，因此營養均衡的飼料將扮演水產養殖產業成敗的重要關鍵。魚類營養需求的資訊必須建立在具有可性度的結果上，所以合理的實驗設計以及具有統計意義的數據極為重要。本課程將介紹在水產養殖的不同場域，包括實驗室、中間試驗場及田間試驗場，如何進行實驗設計、數據收集及結果分析。課程將有助於學生瞭解魚類營養研究，並可以應用於飼料公司的研發單位或國內外研究機構。

## **Methodology of fish nutritional research 2 E**

Aquafeed accounts for about 40-60% of total production costs in most intensive aquaculture system.

The feeds function as a source of nutrients for fish, thus, a well nutritionally-balanced feed plays an important role in the success of aquaculture business. Information on nutritional requirements for fish must be based on credible research results. Logical experimental design and statistically significant data are required. The course will introduce the experimental design, data collection and result analysis for fish nutritional study in different facilities, including laboratory system, test-field and field trial. It can help students to understand fish nutritional study and to apply the skills in R&D section in feed company and domestic or global research institutes.

#### (四) 動物科學與畜產系：

##### 基因選種與繁殖

1 選

沈朋志、彭劭于、楊國泰、  
姜中鳳

本課程著重在針對亞熱帶氣候抗熱緊迫種豬基因選種策略與繁殖技術相關知識之教學，包含基因選種檢測方式、種豬登錄選留與更新、種豬經濟性狀性能評估、種豬配種策略、種公豬精液品質分析，以及繁殖管理與人工授精技術之應用。

##### Genomic Breeding and Reproduction

1 E

P. C. Shen, S. Y. Peng,  
K. T. Yang, C. F. Chiang

This teaching course is focus on the genomic breeding strategies and reproductive technology for pigs in response to heat resistance of the subtropical climate. Courses content including the examination of genetic selection, registration of breeding pig and update, evaluation of breeding pig economic traits performance, breeding strategy, analysis of breeding boar semen quality, practical operation of modern pig farms, breeding management and artificial insemination technology, and etc.

##### 基因選種與繁殖實習

1 選

沈朋志、彭劭于、楊國泰、  
姜中鳳

本課程著重在基因選種與繁殖技術之實務操作，包含基因檢測分析操作、種豬經濟性狀資料收集與估算育種價、種公豬精液鏡檢觀察、稀釋精液與人工授精操作，進一步培育基因選種與高效繁殖生產技術專業人才。

##### Practicing of Genomic Breeding and Reproduction

1 E

P. C. Shen, S. Y. Peng,  
K. T. Yang, C. F. Chiang

This practice course is focus on the genomic breeding strategies and reproductive technology. Courses content including the genes testing and analysis, collection of breeding pig economic traits data and breeding value evaluation, microscope observation of breeding boar semen quality, semen dilution and artificial insemination. We will further cultivate professional talents in genomic selection, efficient breeding and production technology.

##### 現代化豬隻飼養管理

2 選

姜中鳳、余祺、吳錫勳

本課程導入丹麥 Dalum 學院豬隻飼養實務課程，著重於介紹現代化豬隻生產相關之科學與技術，且以培育養豬產業從業即戰力為目標，課程內容包含智慧化豬場經營管理實務、飼料添加劑使用策略、動物營養和飼養策略、智慧化豬場紀錄與電腦管理、豬場生產履歷、智慧化畜舍設計與規劃、以及智慧化畜舍設備操作理論與實務，涵蓋實習課程，深入淺出探討各生產階段之實用技能，使學生透過學習了解豬隻生產全貌，且具備日後投入相關產



業之專業知能。

## **Modern Swine Feeding and Management                      2     E     C. F. Chiang, C. Yu, H. H. Wu**

This course combines the practical training course of Dalum College in Denmark, focusing on the science and technology related to modern pig production, and aims at cultivating the pig industry's employment, and includes intelligent pig farm management practices and strategies of feed additives application, animal nutrition and feeding strategies, intelligent pig farm records and computer management, pig farm production resume, intelligent housing design and planning, as well as intelligent equipment operation theory and practice. Including practical training, students can understand the whole picture of modern pig production, and have the professional knowledge to invest in the relevant industries in the future.

## **現代化豬隻飼養管理實習                      1     選                      姜中鳳、余祺、吳錫勳**

本課程以丹麥 Dalum 學院養豬實作課程為基礎，結合台灣本土商業養豬環境與文化條件，透過現場實務操作，強化飼養管理知識與技巧，培育學生成為真正養豬經營之專業人才。

## **Practicing of Modern Swine Feeding and Management     1     E     C. F. Chiang, C. Yu, H. H. Wu**

Based on the pig farming practice course at Dalum College in Denmark, this course combines Taiwan's realistic pig farming environment and cultural conditions, strengthens the knowledge and skills of breeding management through on-site practical operations, and cultivates students to become professionals in swine feeding and management.

## **豬場生物安全管理                      1     選                      邱明堂、林昭男**

本課程主要教授豬場生物安全相關知識，以學術理論為基礎，進行實務運用之論述。課程內容涵蓋生物安全之範疇、常見之生物性病原種類及特性、生物安全之具體措施、監控模式及方法、評估及改善策略。

## **Biosecurity Management of Pig Farms                      1     E                      M. T. Chiou, C. N. Lin**

The main topic of this course is not only biosecurity-related scientific-base knowledge, but also including practical information used in the field. The biosecurity concept, typical microbes spread and infection pattern, perform strategies, monitoring model and techniques, assessment and improvement methods of biosecurity will be included.

## **豬場生物安全管理實習                      1     選                      邱明堂、林昭男**

本課程主要教授豬場生物安全之相關知識及實務操作。課程內容包含常見之生物性病原之觀察、消毒劑之實務運用、生物安全措施之擬定、監控及評估等實務訓練。

## **Practicing of Pig Farm Biosecurity Management                      1     E                      M. T. Chiou, C. N. Lin**

The main topic of this practice course is including practical biosecurity-related knowledge used in the field. The microbe culture and observation, the function, mechanism, and applied strategies of different type of disinfectant will be introduced. Plan, monitor, and assessment of biosecurity program

will be also included for practical training.

### (五) 科技農業學士學位學程：

#### 園藝療法概論

2 選

周宛俞

本課程旨在教介紹園藝治療的定義與應用，透過理論介紹、參訪活動、園藝實作及方案設計等教學，使同學能掌握園藝治療的概念，運用園藝治療的方法，並能規劃園藝治療方案，以增進自身與他人的生活福祉。

#### Introduction of Horticultural Therapy 2 E

This course is to introduce the definition and application of horticulture therapy. It combines theory introduction, visiting activities, horticultural practice, and curriculum design. Students will understand the application of horticulture therapy and design therapeutic program to benefit all themselves and others.

#### 療育環境設計

2 選

周宛俞

本課程以講授、分組討論及實際操作療育環境設計實例之方式，讓學生了解「環境」於身心減壓以及健康促進中的角色，也進一步討論無障礙環境、通用設計、療育庭園與戶外療育景觀設計之應用。

#### Therapeutic Environment Design 2 E

This course is to introduce the theories and concepts of therapeutic environment design. Student will understand the role of environment stress relief and health promotion. It will also include the accessible environment, universal design, practice of healing garden and therapeutic landscape.

#### 土壤與肥料實習

1 選

王鐘和

本課程藉由實際操作讓學生對土壤、肥料及兩者與作物生產間的關係有更深刻的印象。實習內容包含：土壤樣品的採集與調制，土壤剖面觀察，土壤總密度與土粒密度的測定，土壤機械分析，田間容水量的測定，土壤 pH 值和石灰需要量的測定，不同土壤 pH 值對作物生育的影響，土壤有機質和無機養份的測定，土壤 CEC 的測定，肥料認識與分析，肥料用量實驗，堆肥製作，不同堆肥成熟度對作物生育的影響。

#### Practice of Soil and Fertilizer 1 E

The laboratory course uses hands-on experiments to let students know more about soils, fertilizers and their roles in crop production. The experiments include: Soil sampling and preparation, Description of soil profile, Determination of bulk density and particle density, Particle size analysis, Measurement of field capacity, Soil pH and lime requirement, pH effect on crop growth and development, Soil organic matter and mineral nutrients analysis, Cation exchange capacity, Knowing fertilizers and fertilizer analysis, Optimizing fertilizer application, Compost making, Compost maturity on crop growth and development.

#### 肉品加工

2 選

鄭富元

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。

#### Meat Products Processing 2 E

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.

### 運算思維與資訊科技應用

2 選

郭博仁

政府推動新農業是為了創新台灣農業，以創新、就業與永續，期建立農業生產新模式，以建構台灣農業新價值，與現代化農業。本課程客製化將引入科技農業新概念，介紹物聯網在農業應用，5G 資通網之運算思維、區塊鏈應用、程式介紹撰寫，以提供加值農學院學生科技農業必備知識與資訊技能，及跨領域職場資訊必備技能。

### Computational Thinking and Information Technology Applications 2 E

The government's promotion of new agriculture is to innovate Taiwan's agriculture, with innovation, employment and sustainability, and to establish a new model of agricultural production in order to construct new agricultural values and modern agriculture in Taiwan. The customization of this course will introduce new concepts of science and technology agriculture, introduce the application of the Internet of Things in agriculture, 5G information communication network computing thinking, blockchain applications, program introduction and writing, so as to provide the necessary knowledge and information skills of science and technology agriculture for students of the College of Agriculture. , And necessary skills for cross-field workplace information.

### 智慧農業與自動化實習

3 選

因應智慧農業需求，針對非電機背景之學生，安排工業配線、工業電子、IoT 及無人機應用等課題，安排相關入門實作或操作課程，以奠定自動化設備應用之基礎能力。。

### Smart Agriculture and Automation Practice 3 E

In response to the needs of smart agriculture, for students with a non-electrical background, arrange courses such as industrial wiring, industrial electronics, IoT, and drone applications, and related practice or operation. To help the students own the foundation for the application of automation equipment..

## (六) 食品安全管理研究所：

### 食品化學與安全管理特論及實習

3 選

龔得安

本課程詳細討論食品中重要成分的物理與化學性質，從這些基礎以了解食品生產、加工、儲存與包裝過程中的化學反應或分析方法。研究生也將在本課程當中，學習到單一食品成分與化學結構在食品安全管理的關係。

### Special Topics in Food Chemistry and Safety Management Practice 3 E Kung Te An

The physical and chemical properties of the important constituents of foods will be discussed in detail where these form the basis for understanding either the reactions during the production, processing, storage and handling of foods or the methods used in analyzing them. Graduate students will also learn the relationship between the chemical structure and properties of individual food constituents in food safety management system.

### 質譜分析原理及應用

2 選

龔得安

質譜分析技術目前廣泛應用於食品安全、環境分析、生物醫學、蛋白體研究與法醫鑑

定等領域，本課程開始時會先有系統地詳細介紹質譜儀的功能與運作原理，其包含儀器的元件組成，游離法的方法(電子游離，化學游離，快速元子撞擊，基質輔助雷射脫附游離，電噴灑游離)，質量分析器(扇形磁場，離子井，飛行時間，四級柱)，質譜串聯術等。了解質譜在食品安全上扮演很重要的角色以及對社會有重大貢獻。最後，學生們通過研讀相關文獻和參觀本校農水產品檢驗和認證中心的質譜儀來印證自己在課堂上所學的知識。

## **Mass Spectrometry**

**2 E**

**Kung Te An**

Mass spectrometry is widely used in food safety, environmental analysis, biomedical science, and forensic applications. This course will start with a systematic and detailed description of instrumental principle in a mass spectrometer, understanding the basic components of MS, Ionization methods (EI, CI, FAB, MALDI, ESI), the principle of mass analyzer (magnetic sector, ion trap, time of flight, quadrupole) and tandem mass spectrometry. It is very important to know the significant influence of MS on food safety and the role of MS in the modern society. Finally, students confirmed their knowledge in class by studying related literature and visiting center for agricultural and aquacultural products inspection and certification.

## **農水產品衛生安全學**

**2 選**

**龔得安**

本課程之主旨在講授農產與水產之食品衛生與安全相關知識，課程內容包括食品衛生與安全基本概念、微生物食品中毒、天然毒素(植物性及動物性)、黴菌毒素、環境污染物、農業化學物質、食物過敏、有害性金屬、農藥、動物用藥殘留、食品用洗潔劑之使用管理、重金屬污染等。使同學具備農水產品衛生安全衛生議題之判斷能力及相關專業知識。本課程與 SDGs 相關項目為健康與福祉。

## **Food Safety and Sanitation for Agricultural and Aquaculture Products 2 E Kung Te An**

The course is designed to teach the knowledge of food hygiene and safety in agricultural and aquacultural products, including basic concepts of food hygiene and safety, microbial foodborne diseases, natural toxins (plant and animal) mycotoxins, environmental pollutants, agricultural chemicals, food allergies, harmful metals, pesticides, the use of veterinary drugs in food-producing animals, the use of food-grade detergent. Students can accurately recognize food safety/hygiene and be familiarized with solving problems using knowledge in food safety/ hygiene. This course is relevant to these items of SDGs as following: Good health and Well Being.

## **餐飲衛生安全管理特論**

**2 選**

本課程重點內容包括餐飲衛生與安全相關法規、危害食品衛生的因素、食品中毒之處理及防範、食品安全管制系統、餐飲衛生安全相關規範及認證制度、食材之採購及驗收、食材之儲存及發貨、餐點製備之注意事項、清洗與消毒、病媒管制與廢棄物處理、餐廚建築規劃與衛生安全維護、意外傷害、職場安全與危機處理。藉由密集式的理論與實務課程研討，讓同學體認到餐飲衛生管理的專業性與重要性並奠定同學對餐飲衛生安全的知識與實務技能。

## **Food Service Sanitation and Safety Management**

**2 E**

This course focuses on the part of the semester, including the legislation of food hygiene/safety, factors of endangering food hygiene, treatment and prevention of foodborne disease, hazard analysis and critical control point (HACCP), the related regulations and certification system of food service safety, procurement and acceptance of food, storage and delivery of food, precautions for meal preparation, cleaning and disinfection, vector control and waste disposal, kitchen building planning and hygiene and



safety maintenance, accidental damage, workplace safety and crisis management. Students lay on the food hygiene/safety knowledge and practical skills, with intensive theoretical and practical courses seminars, so that students understand the professionalism and the importance of food hygiene management.

## 農水產品產銷履歷與流通特論

## 2 選

## 羅之綱

因應日漸複雜和多樣化的食品供應鏈，世界各國為確保消費者食的安全、安心，日益重視食品可追溯性（Traceability）之建構，以及良好農業規範（GAP）等各階段作業規範之實施。推動農、畜、水產品產銷履歷驗證制度，採取嚴密驗證體系，藉以全方位保護國內消費者的飲食安全，與提升國產農產品的國際競爭力，創造農產品的附加價值。

產銷履歷制度可以讓消費者安心購買、享用安全的農產品，更可以為保護台灣永續經營的農業環境善盡心力。本課程介紹如何透過國際認證體系嚴密把關，確保產銷履歷農產品符合台灣良好農業規範（TGAP）等作業基準及相關法規，確保產品安全無虞，並降低農業操作造成的環境負荷；藉由網際網路農產品產地、生產者、生產過程等資訊的公開化給予充分的尊重；另外在食品安全事件發生時，如何經由可追溯化的管理和流通體系的運作，讓主管機關、認證機構及相關業者，精確釐清危害來源，並且快速回收問題食品，有效降低食安風險和危害。

## Traceability of Agricultural and Aquaculture Products

## 2 E Chih-Kang Lo

In response to the increasingly complex and diversified food supply chain, countries around the world pay more attention to the construction of food traceability and the implementation of good agricultural practice (GAP) in order to ensure the safety and security of consumers' food. Promote the production and marketing record verification system of agricultural, livestock and aquatic products, and adopt a strict verification system, so as to protect the food safety of domestic consumers in an all-round way, enhance the international competitiveness of domestic agricultural products, and increase the added value of agricultural products.

The production and marketing resume system can make consumers feel at ease to buy and enjoy safe agricultural products, and can also do their best to protect Taiwan's sustainable agricultural environment. This course introduces how to ensure the production and marketing of agricultural products in accordance with TGAP and other operation standards and relevant laws and regulations through the international certification system, so as to ensure the safety of products and reduce the environmental load caused by agricultural operation; give full respect to the information disclosure of agricultural product origin, producer and production process through the Internet; and When food safety incidents occur, how to make the competent authorities, certification bodies and relevant operators accurately identify the source of hazards through the operation of traceable management and circulation system, and quickly recover the problem food, so as to effectively reduce food safety risks and hazards.

## 食品添加物與安全管理特論

## 2 選

## 龔得安

食品添加物的種類眾多，其廣泛應用於食品的製造、加工與調製上，可提高食品之保存性、功能性及應用性。然而，食品添加物的不當使用與管理，卻會造成食品安全問題而影響消費者之健康。本課程將介紹常見食品添加物的種類、特性與功能以及食品添加物其對食品之影響。本課程介紹食品添加物的種類、特性與作用機制，各類食品添加物的使用範圍及限量，安全性以及世界各國的管理法規之比較，並說明其在食品與餐飲上之應用，讓學生瞭解各種食品添加物之專業知識與熟悉正確之應用與管理。

## Food Additives and Safety Management

## 2 E

## Kung Te An



There are many types of food additives, which are widely used in the manufacture, processing and preparation of food, which can improve the preservation, functionality and applicability of food. Although food additives have multiple uses, improper use and management can lead to food safety problems and affect health of consumers. This course introduces the types and characteristics of food additives, function of food additives, the use range and limit of various food additives, safety of food additives, comparison of food additives regulations in various countries, and explains their application in food and catering, so that students can understand the professional knowledge of various food additives and be familiar with the correct application and management.

食品安全管制系統(HACCP)基礎訓練 2 選

本課程邀請產官學研專家針對品質管制系統方便，傳授食品法規、GHP、HACCP、製程管制、線上監測等技術，包括計畫書建立、程序書撰寫、施行步驟、內部稽核、矯正措施及實務演練等，讓學生充分認識及熟練食品危害分析與重點管制系統，以強化學生進入職場從事食品品質保證的能力。

## Hazard Analysis and Critical Control Points (HACCP) 2 E

In this course, expert speakers from industry, government, university or institute will be invited to share their knowledge and experiences on food law, GHP, HACCP, process control measures, on-line monitoring, etc., including developing HACCP plan, documentation, implementation, internal auditing, corrective actions, practice and exercise, etc. One of objectives is to allow students to apprehend and master the Hazard Analysis & Critical Control Points system, and promote their proficiency of food safety assurance as they working in industry.

產業實習 2 選

為增強本所學生與食品安全相關產業鏈結，本課程擬讓同學進行校外實習，學生依據自己的興趣與論文指導教授之建議，至國內外特定的食品安全相關產業實習(食品檢測公司、果菜市場檢驗部門、食安顧問公司)或公家機關機構實習(衛生局、食藥署、屏東檢測中心)，透過機構之安排，讓學生體驗產業實地工作，以增加專業能力與實務經驗，使學生能在理論與實務兼具。

## Working-Based Learning 2 E

In order to enhance the links between the students and related food safety industries, this course intends to allow students to perform off-campus internships. Students based on their interest and recommendations of thesis advisor to study in a particular domestic and foreign relevant government agencies or private utility companies such as to study in a particular domestic and foreign relevant government agencies or private utility companies such as food inspection company, health bureau, pesticide company, food safety assessment corporation. Students can combine both theory and practice, and increase the professional competence and practical experience.

## 二、 工學院

### (一) 土木工程系：

#### 建築資訊模型概論

3 選

韋家振

以學習「Autodesk Revit」建模軟體，使學生具有 BIM 跨設計與工程技能平台能力。帶領同學以 Autodesk Revit 軟體來建立 BIM 模型。課程中並講解建築實務工程對 BIM 模型的需求，以及建模軟體所提供的相對應解決方案。

#### The Introduction of Building Information Modeling

3 E

Chia-Chen, Wei

By learning "Autodesk Revit" software, students have the ability with BIM cross-design and engineering skills. Lead students to create BIM models with Autodesk Revit software. In the course, it also explains the requirements of BIM models in construction practical engineering and the corresponding solutions provided by modeling software.

#### 灌溉管理

3 選

葉一隆

本課程目標是對於農業水資源系統中以最少灌溉成本達成最佳產量，此代表意義為系統之規劃、設計、新建及維護管理達到效率最佳化。灌溉雖是將水適時適量提供作物生育所需，所具備「生產」機能，現今強調彰顯「生態、生活」機能。水及土地資源使用合理規劃可為環境改善之里程碑，結合農業水資源利用之農地重劃政策推行將形成新契機。灌溉排水最佳化將可達成環境改善及在單位耗水量下達到單位產量增加等機會。現今科技下對於灌溉管理仍有研究發展空間。

#### Irrigation Management

3 E Yi-Lung, Yeh

The goal of the course is utilized to probe better production at lower costs and explore means to optimize the efficiency of planning, design, construction, operation and maintenance of water resources systems. Water brought to raw land by the technology of irrigation has transformed large areas into dependable, sustained productivity and wealth. It changed a hostile natural environment into one friendly to man and to his living and economic needs. Water use planning and land use planning must be coordinated to form the cornerstone of environmental improvement. New opportunities will emerge as land use policies are defined and water use is related to the changing picture. Optimizing irrigation and drainage systems will provide excellent opportunity for achieving environmental enhancement with concomitant increases in unit yield per unit water consumed. We have a long way to go, but much can be done now with present technology. There are evident in the exciting trends towards increased efficiencies in the operation of irrigation systems and the application of irrigation water.

#### 地下水管理

3 選

地下水資源管理是自然科學與社會的交叉科學。課程大綱:緒言、地下水資源管理概述、地下水流方程式、地下水質及污染傳輸、地下水管理模式、地下水管理最佳化法、地下水資源分配模式、地下水質模式、地下水系統反向推求法等章。

#### Groundwater Management

3 E

The course of groundwater resources management involves the allocation of groundwater supplies and water quality to competing water demands and uses. The main contents of course contain such as: groundwater resources, groundwater flow equations, groundwater quality: The mass transport problem, numerical methods in groundwater management, optimization methods for groundwater management,

groundwater supply management models, groundwater quality management models, the inverse problem in groundwater systems

### 統計水文學

3 選

本課程主要介紹統計方法應用於水文資料分析之方法，課程內容包括：1. 機率定律 2. 基本統計概念 3. 機率分佈函數 4. 迴歸與相關分析 5. 信賴區間與假設檢定 6. 資料產生方式 7. 時間序列水文分析 8. 時間序列水文模式介紹。

### Statistic Hydrology

3 E

The objective of the course is prepared for the students interested in learning how to use the statistical models and methods as valuable tool to analyze hydrologic and engineering problems. The major contains in this course include basic concept of probability and statistics, probability distribution function, regression and correlation analysis, confidence intervals and hypothesis testing, analysis of hydrologic time series and stochastic hydrologic models

### 災害管理

3 選

本課程在介紹災害管理方法，課程內容包括災害種類與致災原因、國內外災害管理比較、災害應變管理、災害管理政策、災害管理資訊系統。

### Disaster Management

3 E

The course present the disaster management methods. The subject includes disaster types and cause reason, disaster response and management methods and policies

### 水資源系統分析

3 選

本課程主要在介紹如何利用系統分析之技術來處理各種水資源開發規劃時所面臨之問題，授課內容包括：線性規劃，動態規劃，水資源系統之不確定性，河川流域確定性模式分析，河川流域時變性模式分析，灌溉系統操作分析，水庫給水操作模式。

### Water Resources System Planning and Analysis

3 E

The objective of the course is prepared for the students in learning how to use the method of the system analysis to solve the problem of water resource developing and planning processes. The major contents in the course include linear programming, dynamic programming, deterministic river basin modeling, stochastic and operation, reservoir operating rule

### (二) 車輛工程系：

### 計算流體力學

3 選

蔡耀宇

計算流體動力學是流體力學領域中的其中之一，可以透過計算機解算出流場的細節。計算流體力學的數值模擬方法可預測剪應力、速度及壓力曲線，以及流線，與實驗得到全域值的性質互補。使用數值模擬方法進行高速運算需要三個步驟才能完成，包括：前處理（幾何模型及網格建構）、模擬計算（將前處理結果加上邊條件及出始條件後，疊代求解一個複雜的偏微分方程式）及後處理（圖表製作及流場可視化）。其中模擬計算是最主要的部分，隨計算機速度及記憶體容量的突破，加上平行計算興起，使的計算時間大幅縮短。而網格形式（結構化或非結構化或混合型）不同需搭配不同演算法，在計算過程若不能收斂，則需回頭修正網格使其收斂，因此模擬計算需花費較多時間。本課程介紹計算流體力學數值模擬方法，主題包括：（i）前處理(模型修復及網格建構)。（ii）案例研究模擬計算

測試(網格、數學模型及演算法選用)。(iii) 後處理(圖表製作及流場可視化)。

### Computational Fluid Dynamics

3 E Y.Y.Tsai

Computational fluid dynamics (CFD) is one of the fields of fluid dynamics, which can obtain detailed flow fields through numerical simulation. CFD numerical simulation can predict wall shear stress(WSS), curves of speed and pressure, and streamlines, which are complementary to the global values obtained from experiments. The high-speed calculation of the numerical simulation method requires three steps, including: Preprocessing is to build geometric model and mesh. The simulation calculation is to iteratively solve a complex partial differential equation after adding boundary conditions and initial conditions to the preprocessed mesh. Post-processing is parameters analysis and flow field visualization. Among them, simulation calculation is the most important part. With the breakthrough of computer speed and storage capacity, and the rise of parallel computing, computing time has been greatly shortened. The mesh types include hexahedral, tetrahedral, prism, pyramid, quad, tri, and bar. Different types require different algorithms. If the calculation process fails to converge, you need to go back and modify the mesh to make it converge. Therefore, simulation calculation requires more time. This course provides computational fluid dynamics numerical simulation methods, Topics include: (i) Preprocessing (Geometric model repair and mesh building). (ii) Test cases of numerical simulation studies (selection of mesh type, boundary, turbulence model and algorithm). (iii) Post-processing (chart production and flow field visualization).

### 整車試作實務(1)

3 選

合授

本課程用於培養學生對於電動車輛之設計與製造之實作能力，以利畢業後能順利與相關產業進行接軌。課程內容涵蓋電動車輛原理概念、車輛結構設計與製造、車輛底盤之設計與製造有效建構完善的電動車輛產業服務價值鏈，培訓電動車輛產業所需的相關人才。

### Vehicle Prototyping Practice (1)

3 E

Joint teaching

This course is aimed to cultivate students to have practical abilities on design and manufacturing technology for related industry. The contents of this course include the introduction of the motor-driven vehicle, body design and manufacturing technology, chassis design and manufacturing concepts. With a complete training of design-manufacturing-service chain for the motor-driven vehicle industry, the student will have all the skills they need for immediate employment after graduation.

### 整車試作實務(2)

3 選

合授

本課程用於培養學生對於電動車輛之設計與製造之實作能力，以利畢業後能順利與相關產業進行接軌。課程內容延續整車試作實務(1)之課程內容，將車輛電子與通訊之設計與製造、車輛外型設計與車燈選用與製造、最後配合偵錯與維修調校技術等基礎完整涵蓋，有效建構完善的電動車輛產業服務價值鏈，培訓電動車輛產業所需的相關人才。

### Vehicle Prototyping Practice (2)

3 E

Joint teaching

This course is aimed to cultivate students to have practical abilities on design and manufacturing technology for related industry. The contents of this course extend the contents covered in the course "Vehicle Prototyping Practice (1)" to further include the design of onboard electronics and communication, overall vehicle exterior design and manufacturing, car lighting system, and the error detection and maintenance service training. With a complete training of design-manufacturing-service chain for the motor-driven vehicle industry, the student will have all the more advanced skills they need for immediate employment after graduation.



**機器學習****3 選****曾全佑**

機器學習是一種數據分析技術，可以教電腦去做人類和動物自然而然的事情：從經驗中學習。機器學習算法使用數學演算法直接從數據中“學習”信息，而無需依賴預先推導的方程式作為模型。隨著可用於學習的樣本數量的增加，這些算法可以自適應地提高其性能。機器學習使用兩種類型的技術：監督學習（利用已知的輸入和輸出數據訓練模型，以便可以預測將來的輸出）和非監督學習（在輸入數據中發現隱藏的模式或內在結構）。本課程介紹機器學習演算法，主題包括：（i）有監督的學習（回歸和分類）。（ii）無監督學習（聚類和降維）。（iii）案例研究及其在機器學習中的應用，以學習如何應用學習算法。

**Machine learning****3 E****C. Y. Tseng**

Machine learning is a data analytics technique that teaches computers to do what comes naturally to humans and animals: learn from experience. Machine learning algorithms use computational methods to “learn” information directly from data without relying on a predetermined equation as a model. The algorithms adaptively improve their performance as the number of samples available for learning increases. Machine learning uses two types of techniques: supervised learning, which trains a model on known input and output data so that it can predict future outputs, and unsupervised learning, which finds hidden patterns or intrinsic structures in input data. This course provides an introduction to machine learning. Topics include: (i) Supervised learning (regression and classification). (ii) Unsupervised learning (clustering and dimensionality reduction). (iii) Case studies and applications in machine learning to learn how to apply learning algorithms.

**(三) 先進材料學士學位學程****進階材料實務專題****1 選**

由已完成所有實務專題必修課程之學生選定進階材料實務專題方向，在原專題指導教授指導下，由前三個學期建立的實務專題基礎與成果上進行更進階的實驗與研究，最後依據實驗研究結果完成進階實務專題報告。

**Advanced Project Research****1 E**

Based on the knowledge of the three previous semesters of Project Researches, undergraduate students should propose their advanced research project, complete experiments and write a report under advisors' supervision.



### 三、 管理學院

#### (一)農企業管理系：

##### 農業大數據分析應用工作坊(微型課程) 1 選

隨著資通訊科技應用日益普及，伴隨而生的大量資料變成企業運作的重要資產，如何有效的分析、利用這些資料，從其中萃取出有價值的資訊，成企業競爭力的重要來源。隨著物聯網技術大量的被應用在農業經營，大量的環境、作物資料被感測並儲存起來，若能有效的將這些農業資料進行數據分析，將可提供農業經營管理上不同的思維。本課程介紹大數據資料分析技術，課程內容涵蓋資料科學、資料探勘、大數據分析、機器學習與人工智慧等相關技術概念，以農業數據資料為案例，透過簡易的軟體應用(RapidMiner)，讓非資訊背景的學生也可以有效的學習大數據分析。

##### Workshop for Agricultural Big Data Analysis 1 E

Information and communication technologies (ICTs) have been widely used in every field of modern society. With the accompanying large amount of data, how to collect, analyze, and use the data effectively has been an important task of an enterprise. As IoT technologies are widely used in agriculture, a large amount of environmental and crop data are sensed and stored. If these agricultural data can be effectively analyzed, it will provide different thinking in agricultural operation and management. In this course, we introduce the concepts and technologies of big data analysis (BDA). It will cover the concepts of data science, data mining, big data analysis, machine learning, and artificial intelligence in this course. We will introduce BDA concepts by lecturing agricultural cases and using RapidMiner to analyze the data. This course can teach students with non-information backgrounds to learn big data analysis effectively.

##### 農企業管理資訊系統(深碗課程) 1 選

本課程的目的在於運用資料科學與機器學習，來強化農企業資訊系統的效能。同學將透過學習如何有效地運用大數據分析，制定更有效率的金流資訊系統策略及網路社群行銷資訊系統策略。本課程包含：1.如何使用 Python 以計算 KPI 並產生農企業視覺化圖表。2. 如何使用 Python 以進行資料科學分析，找出農企業網路社群行銷資訊的成功因素。3.如何使用機器學習預測農企業的客戶行為。4. 如何使用 Python 以進行資料科學分析，提供農企業的客戶成交率最高的產品建議。5.如何使用 A/B Test 來制定更好的行銷策略。6.如何藉由機器學習來了解農企業的目標客群

##### Agribusiness Management Information Systems 1 E

This course aims to use data science and machine learning to strengthen the effectiveness of agricultural enterprise information systems. Students will learn how to effectively use big data analysis to develop more efficient financial information system strategies and online community marketing information system strategies. This course includes 1. How to use Python to calculate KPIs and generate visual charts for agricultural enterprises. 2. How to use Python to conduct scientific data analysis and determine the success factors of agricultural enterprise online social marketing information. 3. How to use machine learning to predict the customer behavior of agribusiness. 4. How to use Python to conduct scientific data analysis and provide product recommendations with the highest transaction rate for agricultural enterprises. 5. How to use A/B Test to develop better marketing strategies. 6. How to use machine learning to understand the target customer group of agribusiness.

#### (二)企業管理系：

**整合行銷傳播實務特論****2 選****賴鳳儀**

本課程以理論為本，實務應用為主，旨在透過行銷傳播理論觀念基礎，從建構品牌溝通規範、品牌定位、了解消費者、規劃促銷組合，以傳遞產品與服務的理念及一致性品牌溝通訊息。在多元媒體與溝通管道的整合規劃，內容創意運作以及大數據的輔助分析，達到行銷策略綜效。

本課程主要目的在教導學員理解行銷傳播概念並能將各項行銷溝通工具特色(例如廣告、公關與宣傳、銷售促進及品牌活動、社群與內容操作、電商平台網路傳播等)靈活運用，課程搭配大量實務界業師專家及案例講解，培養學生具有行銷傳播溝通的理解與基本應用能力。

**Special Topics on Integrated Marketing Communication (Special topics on IMC) 2 E****F.Y. Lai**

This course emphasizes on both concepts and practical applications of coordinating various promotional elements and marketing activities in a more integrated strategic approach. Through using the “big picture” approach to planning marketing and promotion programs and coordinating the various communication functions (including sales promotion activities, publicity and public relations, social media and social group operations) to create a consistent, unified image of a firm, rather than primarily based on advertising along. This course in particular includes large portion of co-teaching with IMC industry experts, students are able to learn the newest trends, cases, and applications of IMC..

**產業實務專題****3 選**

本課程的重點是教學生如何整合和應用他們所學到的與企業管理相關的專業知識。從綜合的角度來計劃教學活動。不同的學生會根據自己的興趣在不同的企業管理子領域中選擇不同的專業指導老師。該領域的教師將提供指導和實務培訓，並指導學生使用所學的管理技能來擴展學生在專業和實務方面的進階知識與學習，落實本校技職教育之特色與精神，增進學生職場實務經驗，推動實務人才之養成

**Special Topics on Industrial Practices****3 E**

This course focuses on teaching students how to integrate and apply the professional knowledge related to business administration they have learned. The teaching activities is planned from an integrated perspective. Different students will choose different professional instructors in different business management sub-fields according to their own interests. Teachers in this field will provide guidance and practical training, and guide students to use the learned management skills to expand students Advanced knowledge and learning capabilities in professional and practical aspects. The purpose is to fulfill the characteristics and spirits of technical and vocational education, enhance students' practical experience in the workplace, and promote the cultivation of practical talents.

**(三)餐旅管理系：****法式甜點專業用語(微型課程)****0.5 選****方中宜**

本課程為提升餐旅系學生烘焙學習所需使用之法語閱讀能力所開設之 9 小時微型課程。

主要內容針對生活用語與甜點名稱、烘焙製程中所需法語等進行法語表達訓練，在認識法語字彙後並進行午茶情境演練，期使學生能即學即用。此外，課程中將以圖案與文字結合之字卡方式編撰結合相關主題烘焙字彙(如下範例所示)，讓同學更快速可以發揮口說與閱讀之能力。

**French Dessert Professional Jargon 0.5 E**

The purposes of the course are as follows: (1) To enable students to understand French as it is actually used in baking, Dessert name , Tools etc., (2) To enable students to use French confidently and effectively in baking. After completing this course, students will be familiar with French Dessert, to know how to be professional in cooking through undertaking special projects.

**飯店韓語入門攻略(微型課程) 0.5 選 陳達謙**

本課程為提升餐旅系學生烘焙學習所需使用之法語閱讀能力所開設之 9 小時微型課程。

主要內容針對生活用語與甜點名稱、烘焙製程中所需法語等進行法語表達訓練，在認識法語字彙後並進行午茶情境演練，期使學生能即學即用。此外，課程中將以圖案與文字結合之字卡方式編撰結合相關主題烘焙字彙(如下範例所示)，讓同學更快速可以發揮口說與閱讀之能力。

**Korean for Hospitality Industry 0.5 E**

The main content is to conduct Korean expression training for Self-introduction and interview response, hotel and restaurant hospitality procedures, etc., after explaining Korean expressions and conducting situational exercises, so that students can learn and use immediately. In addition, in the course, the Korean vocabulary will be compiled in conjunction with related units, and instructions on etiquette and habits that the service industry should pay attention to will be added..

**服務業日語(微型課程) 0.5 選 彭瓊慧**

本課程為提升餐旅系學生赴日實習所需使用之日語表達能力所開設之 9 小時微型課程。

主要內容針對自我介紹與面試應答、旅館與餐廳待客流程等進行日語表達訓練，在解說日語表達方式後並進行情境演練，期使學生能即學即用。此外，課程中將編撰結合相關單元編寫日語字彙，並加入服務業應注意之禮儀習慣說明。

**Hotel Service Japanese- Interview, Customer Service, Manners 0.5 E**

The main content of this course is self-introduction and interview response, hotel and restaurant hospitality process, etc. Japanese expression training, after explaining Japanese expressions and conducting situational exercises, students can learn and use immediately. In addition, the course will be compiled in conjunction with related units to compile Japanese vocabulary, and include instructions on etiquette and habits that the service industry should pay attention to will be added.

**烘焙伴手禮製作及實習 3 選 蔡宏儒**

本課程為教授學生製作烘焙食品伴手禮產品之實習課程。

教學內容為認識伴手禮分類、配方制定、各類產品製作流程、不同材料種類功能與其應用等。教學內容為鳳梨酥、太陽餅、牛舌餅、花蓮薯、方塊酥、芒果奶酪、蛋黃酥、香蕉酥、芋頭酥、巧克力塔、綠豆凸、Q 餅、生乳捲、堅果塔、桂圓蛋糕、牛軋糖、手工餅乾、烤布丁、蛋捲、金牛角麵包、奶油酥餅、生巧克力、提拉米蘇、牛軋餅、乳酪蛋糕、冬瓜酥及地瓜茶餅等。本課程以紙筆測驗進行知識面的評量，以實作進行技能面的評量，以出席情況、準時與否及學習態度進行情意面的評量。除了產品的專業知識及技能外，本課程特別注重學生正確工作態度與職業道德的培養。

**Baked Goods Gift Box and practice 3 E HUNG-JU TSAI**

This subject is to learn different skill of Baked Goods Gift Box and practice. The contain of the subject are to understand different category Pastry gift Chinese style, the method of the various products,



the functions of ingredients, and its applications. This subject uses a paper test for knowledge assessment, hands-on practice for skill assessment, and attendance, punctuality and learning attitude for emotional assessment. In addition to product professional knowledge and skills, this subject focus more on students' working attitude and professional ethics.

### 西點蛋糕製作及實習

3 選

蔡宏儒

本課程為教授學生西點蛋糕製作與實習課程。教學內容為認識西點蛋糕分類、戚風蛋糕製作、蝴蝶酥、水果派、鮮奶油抹面與水果裝飾、芋頭蛋糕、拿破崙派、抹茶紅豆蛋糕、巧克力蛋糕、巧克力飾片、海綿蛋糕、閃電泡芙、慕斯蛋糕、瑪德蓮、磅蛋糕、盾牌餅乾、情人節蛋糕、芒果慕斯蛋糕、聖誕蛋糕及宴會迷你蛋糕等。本課程以紙筆測驗進行知識面的評量，以實作進行技能面的評量，以出席情況、準時與否及學習態度進行情意面的評量。除了產品的專業知識及技能外，本課程特別注重學生正確工作態度與職業道德的培養。

### Pâtisserie and decoration practice

3 E

HUNG-JU TSAI

This subject is to learn Pâtisserie and decoration practice. The contain of the subject are to identify variety Pâtisserie and decoration hands-on practice, the functions of ingredients, and its applications. This subject uses a paper test for knowledge assessment, hands-on practice for skill assessment, and attendance, punctuality and learning attitude for emotional assessment. In addition to product professional knowledge and skills, this subject focus more on students' working attitude and professional ethics.

### 烘焙食品製作及實習

3 選

蔡宏儒

本課程讓學生瞭解有關烘焙食品的知識，包括材料的特性，配方的平衡，操作的技巧，失敗的原因。藉由實際操作讓學生了解材料經由攪拌、發酵、整形、烤焙、裝飾等等技巧並能判別成品優劣，檢討原因。

### Foundation of Baked Goods and Practice

3 E

HUNG-JU TSAI

This course is to provide students with the opportunity to practice some baking techniques. From measuring ingredients, mixing, fermentation, bread dough making up, baking, cake decorating and then scoring.

## (四)財務金融國際學士學位學程

### 金融資料採礦(特色課程)

2 選

現今快速發展之金融科技，將許多傳統的金融分析方法轉換成金融的科技，其中三種最熱門的投資項目為付款，群眾募資與借貸及金融資料分析方法。本課程將著重於其中之金融資料分析方法將討論量化投資的應用，金融之量化投資是在投資的各個階段中，利用數學、統計、機器學習等分析工具來建立預測模型。本課程旨在對量化投資作廣泛與初步的介紹，並佐以 Python 語言實作，希冀學生能藉此課程對資訊科技與金融結合應用。

### Financial Mining

2 E

The rapid emergence of FinTech has turned conventional approaches to financial technology into three popular investment categories: payments, lending/crowdfunding, and data & analytics. The objective of this course is to explore financial data mining based on quantitative trading data. Data Mining in Finance presents a comprehensive overview of major algorithmic approaches to build predictive models, including mathematics, statistical, machine-learning methods, and then examines the

suitability of these approaches to quantitative trading data. This course primarily provides concepts and analytical approaches to analyzing financial data by using Python language. Students will learn advanced methods and skills for Fintech.

**(五)景觀暨遊憩管理研究所：**

**3D 設計與動畫**

**3 選**

**盧惠敏**

教導學生使用 3D 繪圖軟體進行空間規畫設計與表現，訓練學生三度空間思考，增建學生三度空間設計能力與表現技巧。

**3D design and animation**

**3 E**

**H.M. Lu**

The purpose of the course is to train student to use 3D design software to design and representation. It is to train students thinking with 3D dimensions, and enhance their 3D dimensional representations



傳閱附件 1-4--本校各學院所屬各系(所)課程中英文摘要-人文暨社會科學院

## 四、 人文暨社會科學院

### (一)幼兒保育系

#### 英語兒童繪本與英語學習

2 選

李俊逸

本課程著重於如何透過英語繪本帶領兒童學習英語。培養同學能掌握繪本的口語唸讀聲音表情與互動活動設計，營造輕鬆有趣的英語學習情境。課程中學習如何從閱讀英語繪本學習英語；練習搭配語言學習階段挑選適當讀本。學習唸讀英語繪本的聲音情緒表情；練習抓住英語唸讀的韻律。學習如何從繪本故事主題設計衍生活動。

#### Using Picture Book as English Teaching Materials for Young Learners 2 E Chun-Yi Lee

This course focuses on how to guide young learners to learn English through picture books. Students will be learning how to read picture books to young English learners and how to design activities relevant to the picture books and other methods that help the students to create a fun and relaxed ambience for learning English. The students will be learning how to select appropriate books for young learners that can vary in their language level and be aware of rhythm and sentence patterns in picture books for the learners.

### (二)應用外語系

#### 英文字彙

2 選

字彙是外語學習很重要的一個部分，而且對學生的學術發展也至關重要。因此，本課程的目的不僅是幫助學生理解單字的含義，並有能力應用字彙在日常的生活場景以及專業課程上和通過語言能力檢定。課程內容包括擴增字彙量的字彙學習策略，以及有系統的字彙學習方法。

#### English vocabulary learning

2 E

The purpose of this class is to help students acquire vocabulary, which is essential for foreign language learning and students' academic development as well. Therefore, strategies and methods that will help students expand their vocabulary and increase their word knowledge in a systematic way will be taught. After completing the class, students are expected not only be able to understand the meaning of words and are able to function well in everyday situations, but also succeed academically in content area classes and standardized tests

#### 英語新聞聽力

2 選

本課程採用國內外新聞媒體所播放的英語新聞為主。內容涵蓋政治、經濟、金融、科技、軍事、醫藥、教育、文化、娛樂等各領域。同時介紹新聞的專業術語與特殊語法、以及採訪寫作與播報技巧。

#### Journalistic English Listening

2 E

This course mainly adopts films of English news from international and domestic media. The content covers politics, economy, finance, technology, military, medicine, education, culture, and entertainment. In addition, journalistic terminology and specialized syntax as well as skills of interview, news writing,

and anchor/broadcast will be introduced

## 學術英語聽力

2 選

本課程的目的在幫助學生發展聽力技能和英語能力，以滿足他們學術聽力的需求。課程內容包括一系列的聽力及學習策略，幫助學生藉由了解文本組織，主要大意，話語結構，詞彙以及筆記重點的方法，來瞭解文本中含義。希望完成本課程後，學生能提升專業英語聽力能力，更有信心參與各種學術會議。

## Academic English Listening

2 E

The purpose of this class is to help students develop listening skills and English language abilities to meet their academic listening needs. In this class, students are expected to learn a range of strategies that will help them unlock meanings in spoken texts by focusing on text organization, main ideas, discourse structure, vocabulary, and ways to outline and note down key points. After completing this class, students should feel more confident about listening in lectures and academic conferences

## 多元文化教育

3 選

近年來台灣因為高教國際化、跨國婚姻移民日增等因素，校園內學生族群越趨多元化，亦凸顯多元文化教育的重要性。本課程在透過社會中多樣性特質的討論，介紹多元文化的內涵與理論基礎，並了解多元文化的重要議題及觀點。透過多元文化學習的國際觀，而非以單一的美國或歐美國家世界觀，引領學生思考其他文化的觀點。透過瞭解多元文化的重要議題及觀點，本課程主在培養學生的自我概念(使其認同自己的文化)、培養多元文化意識(了解社會文化的多樣性，進而減低偏見及刻板印象)、強化學生跨文化能力(透過群際關係的了解，培養自我多元文化的觀點)，並期能加強學生公民意識與責任(培養其社會行動力，使其付諸實行，並適應現代的民主社會)。

## Multicultural Education

3 E

With the internalization of higher education and the cross-border marriage migration, the student population on campus has become more diverse. This course aims to investigate the following key questions: What does multicultural education mean today? And how do we understand and respond to the issues and challenges involved as learners, educators, and education stakeholders? Different from the pro-standard English ideologies and monoculture in western countries, we will reflect on definitions of power and privilege, critique understandings of difference, and examine the multi-faceted ways in which multicultural education can be enacted in pedagogy, curriculum, and educational organizations. We will also examine the intersections between race, class, gender, sexuality, language, and citizenship status and try to assess their impact on teaching and learning.

## 文法與修辭

2 選

本課程之目的，在使學生瞭解英語文法的規則以及如何將文法的規則應用於各種文體的寫作。

## Grammar and Writing

2 E

The purpose of this class is two-fold. One is for students to familiarize with the forms of the language. The other is for them to recognize the relationship between the forms and the functions of the language. Readings of different registers will be introduced to demonstrate the diverse nature and aspects of the use of language

**英文名著選讀****2 選**

本課程介紹適合青少年閱讀、或與青少年相關主題之英語文學讀本，透過課堂討論與人物剖析，提昇學生對自我的認識以及對人生的正向思考。

**Appreciation of Literature Masterpieces****2 E**

Selected readers regarding adolescents and their life are introduced. Through detailed reading and in-class discussions, this course aims to promote students' engagement with literature, self understanding, and positive attitude towards life and future

**英語聽說活動教學****2 選**

本課程旨在培育學生為成為英語教師。課程主要傳遞英語教師所應具備之英語教學原理、教學技巧、教材選用，以及實際的教學活動設計與實作。課程主軸涵蓋：(1)母語的習得與第二外語/外國語的學習，(2)兒童學習心理以及教室的管理，(3)英語聽說讀寫之教學，以及(4)藉由英語歌曲、歌謠、遊戲及英語繪本等，設計適當的英語教學活動。

**Designing Activities for Teaching Listening and Speaking 2 E**

The purpose of this course is to prepare students to become well-qualified English teachers for children. Methods and materials in the fields of TEFL, with special emphasis on teaching EFL children learners are introduced. The topics covered include (1) theories of first language acquisition and second/foreign language learning, (2) children's learning psychology and classroom management, (3) techniques for teaching reading, writing, speaking and listening, and (4) activities design through using English songs, nursery rhymes, games, and storybooks

**語言發展概論****2 選**

本課程之目的在使學生瞭解人類如何學習、表達、瞭解、及產生語言。課程內容包括語言發展理論、語言習得過程、認知功能與理解和產生語言相關的機制、及語言障礙。

**Language Development****2 E**

The goal of this class is to introdegration between subjects

**英語演說(1)****2 選**

本課程之目的在使學生瞭解各類英語演說的概念與方式，並透過實際的演練培養學生在演說方面的技巧與能力。。

**Public Speaking 1****2 E**

This course aims to teach students to get familiar with a variety of public speaking events. The areas of study include informative speaking, persuasive speaking, impromptu speaking, and extemporaneous speaking. Students in this class will be given opportunities to develop effective skills in the research, organization, and presentation of speeches. In the end of the class' students will be expected to apply effective verbal and nonverbal communication skills in presenting speeches to an audience; to employ appropriate organizational structures into speech presentations; to perform research and incorporate researched information into speech presentations; to demonstrate effective use of media to enhance speech presentations; and to apply effective speaking and listening skills as they present, observe, critique, and respond to criticism of speech presentations.

## 專業翻譯

2 選

本課程目標有三：

- 1) 以實際業界翻譯案例作教材，強化學生翻譯技能；
- 2) 介紹翻譯市場現況，教導學生開拓翻譯工作機會、爭取翻譯實習機會；
- 3) 教導學生具備專業譯者之工作倫理，並熟悉譯者應注意之事項（如交稿方式及格式。）。

## Specialized Translation

2 E

The objective of this course is threefold:

- 1) To strengthen students' translation skills using the real-world assignments from translation agencies and/or publishers.
- 2) To discuss the status quo of the translation market in Taiwan and how to find translation and internship opportunities.
- 3) To introduce students to the translator's professional ethics and learn how to conduct business like a professional translator.

## (三)客家文化產業研究所:

### 客家語文讀寫

3 選

本課程旨在增進學生客家語文的閱讀、理解及書寫能力，包含認識客家語文書寫的理念及表現方式，以及熟悉客家語文的書寫系統及工具，如拼音、用字、詞彙、文法及修辭等。希望藉由大量客語文學作品的閱讀、賞析及模擬各類文體、主題風格的創作，能建立使用客家語文書寫的習慣，培養學生在生活各個領域的客家語文寫作能力及技巧。

## Reading and writing of Hakka

3 E

The course aims to enhance students' reading, comprehension and writing competence of Hakka, including introduction of concept and presentation of Hakka writing and familiarization of writing system and tool of Hakka, such as Pinyin, wording, vocabulary, grammar and figure of speech. By reading, appreciation and creation of various kinds of literary and thematic styles of great number of Hakka literatures, it aims to construct the habit of Hakka writing and cultivate students' Hakka writing competence and skills in different fields of life.

### 華客語文對譯

3 選

本課程以華客對譯的理論及原則方法為講授重點，藉由華客對譯語料文本的分析、華客對譯實務經驗的檢視，探討華客語文對譯的可譯性、策略與方法，以及華客對譯實務工作遭遇的困難、常見的表達障礙與解決方式，以培養學生具備華客對譯的理論知識與專業素養，並透過實際的操作演練，使學生嫻熟各種語體、詞類對譯轉換的手段、技巧，以提升華客語文對譯的準確性與職場競爭力。

## Translation between Chinese and Hakka

3 E

The course focuses on theories and principles of translation between Chinese and Hakka. By analysis of texts of translation between Chinese and Hakka and review of practical translation experience, it explores translatability, strategy and method of translation between Chinese and Hakka, difficulties in practice, common expression obstacles and solution in order to cultivate students' theoretical knowledge and professional literacy of translation between Chinese and Hakka. By practical drilling, it allows the students to be familiar with the measures and skills of translation of various writing styles and parts of



speech in order to reinforce precision and workplace competitiveness of translation between Chinese and Hakka.

## 台灣客家文學選

2 選

本課程將客家文學在原鄉文化、殖民文化、本土文化不同領域予以分析，以台灣區域文學的歷史為縱軸，配合台灣、社會的變遷，分別探討客家文學思潮與創作的發展與流變。藉由代表性作品的分析討論，使同學認知其時代意義與文化思想的意涵，進而省思客家文學的過去、現在與未來的發展。

## Selected Reading of Taiwan Hakka Literature

2 E

Course this literature in former township culture, colonize culture, native country culture analyze with field Hakka, regard history of regional literature in Taiwan as the axis of ordinates, cooperate with the changes of Taiwan, society, probe into Hakka literature ideological trend and development and rheology creating separately. Discuss with the analysis of the representativeness works, make classmate cognitive their era meaning and meaning of culture and ideology, think the past, now in literature such as Hakka and development in the future.

## (四)休閒運動健康系

### 健身俱樂部管理與銷售實務

2 選

本課程主要目的在培養學生了解健身俱樂部的經營管理並使成為一位稱職的管理者。課程內容包含：產業競爭分析、行政作業管理、人力資源管理、經營理念市場規劃、會務管理、行銷管理、財務與危機風險管理。

## Fitness Club Management and Sales Practice

2 E

The main purpose of this course is to train students to understand the management of a fitness club and to become a competent manager. Course content includes: industrial competition analysis, administrative operation management, human resource management, business concept market planning, conference management, marketing management, financial and crisis risk management.

### 重量訓練指導實務

2 選

這課程主要目的是讓學生了解重量訓練，認識肌肉適能對人體健康的重要性，並結合理論與實務讓學生能安全有效的自我訓練，此外，因為肌肉透過肌腱連結於骨骼與關節上，所以這堂課也會讓學生瞭解，肌肉與骨骼如何互相運作使得人體產生動作，透過課程達成終身運動的習慣。

## Weight Training Guidance and Practice

2 E

The main purpose of this course is to enable students to understand weight training, to know the importance of muscle fitness for human health, and to combine theory and practice to make students safely and effectively self-train. In addition, because muscles are connected to bones and joints through tendons, this class will also allow students to understand how muscles and bones work together to make the body move and use the lessons to achieve lifelong exercise habits.

### 健康管理

2 選

本課程之目的在透過文獻導讀方式，讓學生了解健康促進以及疾病預防之關鍵影響因



素，且透過文獻之蒐集與分析，歸納出動態生活及靜態生活與健康促進及疾病預防之間的相關性。透過本課程，其能培養學生對於健康生活形態之認同，並建立一套正確且有效的指導模式。

## **Health Promotion and Disease Prevention 2 E**

The purpose of this course is to guide students how to read the literature reviews, by doing so, students can get more awareness how to promote healthy and prevent diseases. Through collecting and analyzing the literature review, students can sum up the life style between development and static state, finally to discuss the relationship between promoting healthy and preventing diseases.

## **山域運動與指導 2 選**

使學生學習正確台灣高山休閒運動觀念，並透過本課程深入體驗瞭解台灣山林環境之美、並透過生態解說、無痕山林觀念與實際感受進而達到環境保育及教育觀念，進而引導學生開闊視野及引導反思。

## **Mountain Sports and Guidance 2 E**

To enable students to learn the correct concept of Taiwan's alpine leisure sports, and to thoroughly understand the beauty of Taiwan's mountain environment through this course, and to achieve environmental conservation and educational concepts through ecological explanations, seamless forest concepts and practical feelings, and then guide students to broaden their horizons and guide reflection.

## **(五)社會工作系**

## **社會安全網實務專題 3 選**

社會安全網計畫是政府為整合社會福利相關服務網絡的重要施政計畫，目的是建立社區為基礎的防護體系，提供家庭為中心的整合服務，計畫內容主要包括四個策略，一是布建社會福利服務中心整合社會救助與福利服務、二是整合保護性服務與高風險家庭服務、三是整合加害人合併精神疾病與自殺防治服務，四是整合跨部會服務體系。故，是目前社會工作專業服務重要的服務內涵。本課程內容涵括介紹社會安全網計畫之精神與重點項目、四大策略的內涵與實務處遇，促進學生對於社會安全網計畫了解，以及熟悉處遇服務相關知能。

## **Special project of Social Safety Network 3 E**

The project of Social Safety Net is an important administrative plan for integrating social welfare-related service network. The purpose is to establish a community-based protection system and provide family-centered integrated services. The content of the project includes four main strategies: (1) Establish social welfare service center to integrate social assistance and welfare services. (2) To integrate protective services and high-risk family services. (3) To integrate offenders with mental illness and suicide prevention services. (4) To integrate interagency service system. Therefore, it is an important service connotation of the current social work professional service. The content of this course includes an introduction to the spirit and key point of the Social Safety Net project, the connotation and intervention of four main strategies, facilitate students' understanding of Social Safety Net project and also familiar with the competence of intervention service..

## **會談技巧 2 選**

本課程旨在協助學生認知社工會談的特性，學習社工會談的態度與技巧、包括基本態度、了解問題、問題澄清與確定、問題處理與解決，並提升會談過程自我覺知的敏感度，經由案例演練、角色扮演等實務操作，精進學生會談能力，使之成為有效能的助人者。

## **Interview Skills**

## **2 E**

The purpose of this course is to reinforce student's interview skills including the basic interview techniques, further application and case analysis practice. The ability to understand interactions among individuals, their environment, and their social systems, and to assess the impacts of these forces. The cultivation of self-awareness, respect for cultural diversity as well as concern for local issues.

傳閱附件 1-5--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)熱帶農業暨國際合作系：

#### 中等水文學

**3 選**

本課程主要介紹中等水文學的原則和實務觀念，並學習地球上水運動和分配的原理、熟悉地表水和地下水的理論，進而學習工程設計所需之計算模擬演算工具，以期能讓學生具備解決水文學領域相關問題的能力。

#### Intermedlate Hydrology

**3 E**

This course deals with intermediate Hydrology topics which mainly enables students to learn the principles of water movement and distribution on earth, and getting familiar with theories governing atmospheric, surface, and ground water, and then exercising hydrology on engineering design with computational tools. This course provides students with the relevant advanced knowledge required in analyzing physical problems related to Hydrology.

#### 永續科學講堂—大師講座

**1 選****張珮君**

此永續科學講堂—大師講座將由熱帶農業大學聯盟(UNTA)中各校的學者專家從專業領域出發，配合聯合國公佈之十七項永續發展目標(SDGs)介紹各領域在永續發展的應用及未來展望。師資陣容包含屏科大戴昌賢校長、印尼 IPB University 校長、印尼 University of Brawijaya 副校長、泰國湄洲大學校長及本校與泰國、印尼、波蘭與日本合作學校的資深教師。

近年來，全球暖化，糧食危機、生態保育，以及由貧窮所衍伸的教育、衛生健康問題已成為全球關注的焦點，如何在經濟高度發展的情況下，兼顧環境永續以及解決上述全球性的問題已成為未來顯學。課程希望藉由講者分享自身領域的專業知識及研究成果，帶領同學一同認識不同面向的永續議題，並思考未來世代的因應之道。

#### Sustainability Course Series—Master Lectures

**1 E**

Sustainability Course Series—Master Lectures is composed of seminars by scholars and experts from partner universities in the University Network for Tropical Agriculture (UNTA). This Master Lectures are in line with the 17 Sustainable Development Goals (SDGs) announced by the United Nations. Each speaker will introduce their expertise and the respective applications in promoting sustainable development. The speakers include NPUST President Chang-Hsien Tai, President of IPB University of Indonesia, Vice President of University of Brawijaya of Indonesia, President of Meizhou University of Thailand, and many world-renowned scholars from our partner universities in Thailand, Indonesia, Poland, and Japan.

In recent years, issues such as global warming, food crisis, ecological conservation, and education, and health crisis arising from poverty have drawn the global attention. It is a vital part of sustainable development to search for a solution of these global issues while maintaining the highly developed economy. The course aims to lead students to contemplate different aspects of sustainability issues and ways to respond to future generations through each speaker's professional knowledge and perspectives.

#### 肉品原料與利用

**2 選****黃晁瑋**

本課程介紹肉品原料的種類與特性，使學生對肉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。並進一步，介紹畜產品加工利用的方式與種類，使學生對肉及禽肉與其副產物利用有概括認識，並可提供往後研習肉品加工之參考。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。

## **Raw Material Quality and Utilization of Meat 2 E**

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

### **(二)觀賞魚科技及水生動物健康國際學位專班：**

#### **水生動物生理學專論 2 選**

本課程介紹水產動物之主要生理作用，並以特定主題檢索蒐集最新之學術資料進行研討，使學生了解該領域之最新知識進展，並掌握相關研究技術方法。

## **Advanced Topics on Animal Physiology in Aquaculture 2 E**

This course teaches on the fundamental principles and mechanisms that govern body functions in animals, with an emphasis on the molecular aspects. The class focuses on the fish physiology and environmental adaptation. We will discuss about environmental adaptation of animal and compare each other. Water as a biological medium, Gas exchange, Circulation, Excretion, Osmoregulation. Reproductive physiology, Muscle physiology, Sense organs, Energy and nutrient status of food, Nitrogen balance, Standard and active metabolism, Energy utilization, Effect of environmental factors on physiology of fin and shellfishes, Stress related physiology changes, Structure and functions of important endocrine glands.

### **(三)動物用疫苗國際學位專班：**

#### **生物安全與防疫系統 3 選**

抗原設計對於通過疫苗誘導動物的免疫反應是重要的。蛋白質結構預測及分析是現代疫苗和診斷試劑盒開發的關鍵步驟。該課程將包括基因分析，蛋白質 2D 和 3D 結構分析預測，抗原選擇和設計。該課程還包含如何將蛋白質結構應用於疫苗和疾病診斷的生產。

## **Protein Structure Analysis and Modeling for Vaccine 3 E**

Antigen design is important for immune response induction of animal by vaccination. Protein structure modeling is the crucial step for the modern vaccine and diagnostic kit development. The class will contain the gene analysis, protein 2D and 3D structure modeling, antigen selection and design. The class also contain how to apply the protein structure for vaccine and diagnostic kit production.



傳閱附件 1-6--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：

#### 動物屍體解剖實習

1 選

本課程主要實習各種動物病理解剖的方法和程序,並從而教導學生如何做好屠前屠後的檢查,以及如何採取病材組織,固定組織,製作切片及鏡下觀察組織切片等依據屍體解剖之訓練需迅速確實診斷疾病。

#### Animal Necropsy Lab.

1 E

The course is to provide students some practical experiences in method and procedure of animal necropsy .Some detail and postmortem, inspection procedures , tissue collection, tissue preparation, glass slide preparation and microscopically slide reading will be given to the student in this class simultaneously.

### (二)動物疫苗科技研究所

#### 重組蛋白質表現技術(特色課程)

2 選

柯冠銘等合授

重組蛋白質表現技術是藥物與疫苗開發之基礎。本課程設計主要在介紹各種基因重組蛋白質表現系統技術及醫藥生物科技上之應用。本課程於講課部份將深入介紹重組DNA，蛋白質表現，重組蛋白質純化等技術，與應用並配合實作依照各種表現系統學習建構基因載體、蛋白表現，純化及分析等技術。

#### Recombinant protein technology

2 E kegm..

Recombinant protein technology is the foundation of drug and vaccine development. This course is designed to introduce the technology of various recombinant protein expression system and its application in medical biotechnology. In the lecture part, there will be an in-depth introduction to recombinant DNA, protein expression, purification of recombinant protein and technological applications. In the practical learning various protein expression system, students will be operate protein expression, purification and analysis techniques in laboratory.

傳閱附件 1-7--本校各學院所屬各系(所)課程中英文摘要-達人學院

## 七、達人學院中英文課綱

### 智慧農業與自動化實習 3 選 徐子圭

因應智慧農業需求，針對非電機背景之學生，安排工業配線、工業電子、IoT 及無人機應用等課題，安排相關入門實作或操作課程，以奠定自動化設備應用之基礎能力。

### **Smart Agriculture and Automation Practice 3 E U. K. Hsu**

In response to the needs of smart agriculture, for students with a non-electrical background, arrange courses such as industrial wiring, industrial electronics, IoT, and drone applications, and related practice or operation. To help the students own the foundation for the application of automation equipment.

### 智慧機械概論 3 選 徐子圭

提供學生工業 4.0 的相關知識及實作機會，使學生了解智慧機械之基本架構、內涵、應用範圍與優勢，同時建構學生相關技術之基礎與應用知識，使學生未來能在產業界能快速有效的在智慧製造開發與應用領域持續發展。

### **Introduction to Intelligent Machinery 3 E U. K. Hsu**

Provide students with relevant knowledge and practical opportunities of Industry 4.0, so that students understand the basic structure, connotation, application scope and advantages of smart machinery. To construct the foundation and application knowledge technology for students at the same time. The students can quickly and effectively continuous development on the field of smart manufacturing development and application in the industry in the future.

### 感測元件原理與應用 3 選 陳建興

本課程主要介紹物理及化學感測器原理及其基本應用。內容包括基本物理化學轉換原理、配合電路、溫度、光、聲音、流體、化學等感測器，並配合物聯網資料傳輸等相關主題，以及感測器在居家生活的綜合應用。

### **Principles of sensor and its applications 3 E C. H. Chen**

This course introduces physics and chemistry principle for sensors and transducers. Topics include basic theory of transducers, amplification circuit, temperature sensors, mechanics sensors, photo sensors, auacoustic sensors, chemical sensors, IoT data transfer, and sensors application for home life.

### 居家保健與用藥新知(2) 1 選 羅希哲

- 1.學習中醫基礎理論與居家正確用藥知識
- 2.學習中藥食補的養生理論及中藥茶包製作
- 3.四季藥膳製作
- 4.學習製作中藥保養品

### **Health care and home medication use (2) 1 E S. J. Lou**

- 1.Learning traditional Chinese medical science and correctly use medication
- 2.Knowing the diet therapy of traditional Chinese medicine.
- 3.Make the herbal health food of four seasons.
- 4.Learning how to make the herbal cosmetics.

## 行銷設計學堂新開課程中英文課綱

### 創意與設計思考(微型課程) 0.3 選 蔡展維

- 1.設計思考介紹
- 2.即興創意
- 3.整合運用
- 4.實際演練

**Creation And Design Thinking    0.3    E    C. W. Tsai**

- 1.Introduction to Design Thinking
- 2.The Art and Discipline of Business Creativity
- 3.Final presentation

**數位影音剪輯與後製(Adobe Premiere) (微型課程)    0.6    選    蔡展維**

- 1.熟悉數位影音剪輯的應用原理，及熟練操作課程訓練影像編輯技巧
- 2.能具備操作數位化剪輯軟體能力
- 3.After Effects 特效軟體教學

**Editing and Post-production for Digital Video (Adobe Premiere)    0.6    E    C. W. Tsai**

- 1.Learning the digital sound and image editing application and the skills.
- 2.There will be an introduction to digital editing software.
- 3.Tips for After Effects.

**新產品上市文宣設計(微型課程)    0.6    選    蔡展維**

- 1.攝影秘訣及拍攝練習
- 2.Photoshop 使用技巧教學
- 3.Illustrator 使用技巧教學
- 4.作品改善檢討暨成果展示

**Commercial Design for New Product Launch    0.6    E    C. W. Tsai**

1. Tips for Photography.
- 2.Tips for making imaging and graphic design for the purpose of producing a commercial poster.
- 3.Tips for creating logos, icons and drawings by using industrial-standard vector graphic software.
- 4.Final presentation.

**社群行銷(微型課程)    0.6    選    蔡展維**

- 1.數據分析
- 2.文案寫作
- 3.社群行銷
- 4.整合運用
- 5.作品改善檢討暨成果展示

**Social Media Marketing    0.6    E    C. W. Tsai**

- 1.Data analysis
- 2.Content writing
- 3.Social media marketing
- 4.Integrated application
- 5.Final presentation

**行銷與攝影基礎教學(微型課程)    0.6    選    蔡展維**

- 1.攝影基礎與構圖概念
- 2.攝影秘訣與實作
- 3.攝影棚棚拍
- 4.作品改善檢討暨成果展示

**Marketing and Introduction to Photography    0.6    E    C. W. Tsai**

- 1.Photography and composition
- 2.Tips for photography
- 3.Studio photography
- 4.Final presentation

**時間管理與實作(微型課程) 0.3 選 陳秀足**

- 1.德國式時間管理
- 2.德國式時間管理-高階

**Time managemen and practice 0.3 E H. T. Chen**

- 1.Basic concept of GTM(Germany time management)
- 2.Advanced application of GTM(Germany time management)

**潛意識溝通表達術(微型課程) 0.6 選 陳秀足**

- 1.潛意識溝通基礎架構
- 2.魅力表達影響力
- 3.好感溝通表達技巧
- 4.正向心理幸福學

**The Skill of the Subconscious Communication 0.6 E H. T. Chen**

- 1.Basic Framework of the Subconscious Communication.
- 2.Influence of the Charismatic Expression.
- 3.Presentation Skills for Goodwill Communications.
- 4.Eudaimonia of Positive Psychology.

**微型創業斜槓力(微型課程) 0.6 選 陳秀足**

- 1.微型創業趨勢與構建
- 2.商業文案與企劃書
- 3.自媒體經營實戰
- 4.微創圓夢路啟動職場三力

**Multiple Skills of Micro-Entrepreneurship 0.6 E H. T. Chen**

- 1.The Trend and Construction of Micro-Entrepreneurship.
- 2.Proposal Personnel and Business Copy.
- 3.Practical Experience of Operate Self-media.
- 4.Activate the Three Forces of Career Accomplish Micro-Entrepreneurship Dream.

**創新創業學堂新開課程中英文課綱**

**行銷技巧實務(微型課程) 1 選 鍾智超**

- 1.行銷企劃與策略
- 2.文案撰寫
- 3.整合運用

**Marketing Skills and Practice 1 E C. C. Chung**

- 1.Marketing plan and tactics
- 2.Copywriting
- 3.Integrated application

**商品攝影實務(微型課程) 1 選 鍾智超**

- 1.攝影秘訣及拍攝練習
- 2.作品改善檢討暨成果展示

**Commodity photography practice 1 E C. C. Chung**

- 1.Tips for Photography.
- 2.Final presentation

**創業家經驗分享與實作(4)(微型課程) 0.2 選 鍾智超**

- 1.皮革知識學習



2.創業家經驗分享

3.實作體驗

**Entrepreneurs to share experiences and actual operation(4) 0.2 E C. C. Chung**

1.Learn leather knowledge

2.Entrepreneurs to share experiences.

3.Handmade works.

**創業家經驗分享與實作(5) (微型課程) 0.2 選 鍾智超**

1.建築設計知識學習

2.創業家經驗分享

3.實作體驗

**Entrepreneurs to share experiences and actual operation(5) 0.2 E C. C. Chung**

1.Learn architectural design knowledge

2.Entrepreneurs to share experiences.

3.Handmade works.

**人力資源管理學問-創意溝通(微型課程) 0.3 選 鍾智超**

介紹人力資源相關概念、人員激勵與維持，以及面對全球化人力資源管理的發展與面臨的挑戰。

**Human resource management-**

**Creative communication 0.3 E C. C. Chung**

Presents the theories, policies and practices relevant to the crucial task of personnel management working toward the goals of the organization. This will include motivating, training, developing.

**新創企業品牌形象打造(微型課程) 0.3 選 鍾智超**

品牌識別、品牌塑形概念及品牌定位

**Building brand image of startup 0.3 E C. C. Chung**

Brand identity, Brand shaping concept and Brand positioning

**永續概念培育-創新創意發想(微型課程) 0.2 選 簡赫琳**

氣候變遷、環境汙染與糧食安全及作物危機

**Concepts of Sustainable Development- Innovation and Creative Thinking 0.2 E H. L. Chien**

Climate change, Environmental pollution, food security and damage to crops

**新創企業的智財基礎概念培養(微型課程) 0.2 選 黃祥熙**

商標與專利智慧財產權於產品保護之應用

**Intellectual property foundation concept training of startup 0.2 E H. H. Huang**

Application of trademark and patent intellectual property rights in product protection

**創意培養(微型課程) 0.1 選 黃祥熙**

創意激盪與團隊創意激發

**Creative development 0.1 E H. H. Huang**

Creative thinking and brainstorming and inspiring team creativity

**3D 列印製程實務-材料擠製成型(微型課程) 0.5 選 鄭博元**

課程重點在於建立學生對於 3D 模型的基礎概念、FDM 熱熔融層積 3D 列印的原理與 FDM 熱熔融層積 3D 列印機的操作。因此課程中會使用免費建模軟體 TinkerCAD 進行建模教學，並讓學生設計 3D 作品，在學習 FDM 熱熔融層積 3D 列印機的操作後，透過 Infinity X1 Speed3D 列印機將設計之作品產出。

**FDM 3D printing 0.5 E B. Y. Zheng**

This class will allow students to discover for themselves the potential and limitations of FDM 3D Printing through a build intensive design project. Students can expect to be able to do the following by the end of the course: 1) use TinkerCAD online software to design 3D models; 2) use Cura 3D printing software; 3) operate Infinity X1 Speed 3D printing machine.

### **3D 列印製程實務-光聚合固化(微型課程) 0.5 選 鄭博元**

課程重點在於建立學生對於 3D 模型的基礎概念、光固化 3D 列印的原理與光固化 3D 列印機的操作。因此課程中會使用免費建模軟體 TinkerCAD 進行建模教學，並讓學生設計 3D 作品，在學習光固化 3D 列印機的操作後，透過 MiiCraft Ultra 100 光固化 3D 列印機將設計之作品產出。

### **SLA 3D printing 0.5 E B. Y. Zheng**

This class will allow students to discover for themselves the potential and limitations of SLA 3D Printing through a build intensive design project. Students can expect to be able to do the following by the end of the course: 1) use TinkerCAD online software to design 3D models; 2) use MiiCraft Ultra 100 software; 3) operate MiiCraft Ultra 100 SLA 3D printing machine.

### **雷射設計與實作(微型課程) 0.5 選 鄭博元**

雷射雕刻簡介與應用介紹、繪圖軟體、機具控制軟體、參數設定、雷射切割與組裝。

### **Laser Engraving Design and Implementation 0.5 E B. Y. Zheng**

Introduction and application of laser cutting, drawing software, software for using equipment, parameter setting, laser cutting operation and assembly.

## **產業增能學堂新開課程中英文課綱**

### **TFT-LCD 產業達人(2)(微型課程) 0.5 選 陳念慈**

本課程為教導學生對 TFT-LCD 的基本原理認識，以及深入瞭解 TFT-LCD 材料與設備、TFT-LCD 製作與 TFT-LCD 產業之運作，運用業界所普遍使用的 TFTLCD 材料與生產設備介紹，使學生瞭解產業人員與工程師在 TFT-LCD 業界可扮演的角色與任務。授課內容包括 TFT-LCD 產業、應用、製程簡介、廠務系統介紹。

### **Introduction to TFT-LCD (2) 0.5 E N. T. Chen**

This course is designed to teach students the basic principles of TFT-LCD, as well as an in-depth understanding of TFT-LCD materials and equipment, production and industry operations.

### **顯示器製程概論(微型課程) 1 選 李文宗**

本課程為教導學生對 TFT-LCD 的基本原理認識，以及深入瞭解 TFT-LCD 材料與設備、TFT-LCD 製作與 TFT-LCD 產業之運作。運用產業普遍使用的 TFT-LCD 材料與生產設備介紹，使學生瞭解產業人員與工程師在 TFT-LCD 業界可扮演的角色與任務。授課內容包括 TFT-LCD 產業、應用、製程簡介、廠務系統介紹等。

### **Introduction to TFT-LCD Fabrication 1 E W. T. Lee**

This course is designed to teach students the basic principles of TFT-LCD, as well as an in-depth understanding of TFT-LCD materials and equipment, production and industry operations.

### **MOS 漢堡店經理人才培訓實務研習(微型課程) 1 選 朱永麟**

近年來，隨著國際貿易的盛行，食品安全事件頻傳，也逐漸受到世界各國的重視。本課程將帶領著學生深入淺出的了解國際上的食品法規、安全管控技術、以及風險評估。預期修習過本課程的學生，可以了解未來畢業後，面臨食品安全事件的時候，目前產官學界該如何快速反應，並學會研擬因應策略。

### **MOS Manager Talent Training Practice 1 E Y. L. Chu**

According to the population of global trade, it produces more international food safety accidents. And people pay more attention on food safety. In this course, we will lead students to study the regulation, CCP and risk assessment of food safety. Therefore, we expected that those students could learn to react

with food safety accident and know how our industry, government and academic deal with those issues.

**咖啡產業達人(2)(微型課程) 0.5 選 賴宏亮**

本課程主要內容在敘述咖啡之栽培、管理、收穫、加工調製、貯藏、沖泡方法、品評及案例研究等。

**Introduction to coffee industry(2) 0.5 E H. N. Lai**

The main contents of this course will describe the culture, management, harvest, manufacture process, storage, extraction method, cupping and case study of Coffee.

**健身運動產業行銷發展與趨勢 (微型課程) 0.1 選 蘇蕙芬**

1.分享該如何運用健身房行銷策略，讓自己在眾多連鎖健身房當中突破重圍，成功開發新客戶同時也留住熟客的關鍵技巧，搭配個案研討及豐富的課程內容，激發同學創造力。

2.以淺顯易懂的方式分析目前健身房經營的未來發展趨勢與關鍵成功因素，讓同學能融會貫通。

**咖啡實務與創業(微型課程) 1 選 邱秋霞、許祥純**

本課程帶給學生實作演練的機會並於有經驗企業創業者直接接觸學習的機會，且可以於不同背景的人學習、理論與實務的驗證與應用。

**Coffee Practical And Entrepreneurship 1 E C. S. Chiou, S. C. Sheu**

This course may let students learning from practicing and learning from different education background Implementing what they learn from book.

**永續發展學堂新開課程中英文課綱**

**電子設計輕鬆玩(微型課程) 0.5 選 楊正輝**

1.電子設計簡介

2.計時器/震盪器設計/實習

3.光感測器/自動調光器設計/實習

4.比較器/信號放大器設計/實習

**Easy Play Electronic Design 0.5 E C. H. Yang**

1.Introduction to electronic design

2.Timer/Oscillator design/experiment

3.Photo sensor/automatic trimmer design/experiment

4.Comparator/amplifier design/experiment

**失智症照顧服務(微型課程) 1 選 趙善如、涂筱菁**

本課程旨在協助學生獲得失智症照顧服務之基本知能，結合理論知識與實務應用，幫助學生對失智症照顧服務獲得全面性的認識。冀望發展學生對失智症照顧的興趣，提昇其在該專業領域之就業力，提供兼具效率與效益的照顧服務。

**Dementia Care Services 1 E S. R. Zhao, S. J. Tu**

The primary purpose of this course is to provide basic knowledge and skills in dementia care services. The courses feature an integration of theoretical knowledge and practical application in order to help students have a comprehensive understanding of dementia. It will develop students' interests in dementia care and improve their employment competency in an attempt to provide efficient and effective dementia care services.

# 木材科學與設計系木藝技優領航專班課程摘要(110 入學)

## 一、必修科目

<b>01 木材物理性質與利用</b>	<b>1 必</b>
本課程主旨在使學生體認木材的物理性質的特徵，諸如：木材之比重、水分特性(吸脫濕遲滯、收縮膨脹及吸水性)、熱性質(比熱、熱傳導及熱擴散)、音響性質(吸音率、吸音特性及遮音特性)、電氣特性(導電性及誘電性)等，俾有助於其加工製作與設計材料運用之理解。	
<b>01 Wood Physical Properties and Utilization</b>	<b>1 R</b>
The purpose of the course is introducing the physical properties of wood in the process and design. The contents include: wood specific gravity, wood-moisture relations of wood, thermal properties of wood, acoustic properties of wood, electrical properties of wood.	
<b>02 木材物理性質與利用實習</b>	<b>1 必</b>
本課程使學生熟悉木質物理學性質之測定方法，其內容包括木材之比重、含水率測定、木材之吸、脫濕的含水率遲滯現象、吸濕膨脹率及吸水膨脹率之測定、木材之熱傳導率測定及計算、木材之吸音率測定及計算、木材之誘電率及導電性測定及計算。	
<b>02 Wood Physical Properties and Utilization Lab.</b>	<b>1 R</b>
The objective of laboratory work is to teach the students who become familiar with the methods of measuring the physical properties of wood. The contents include determination of specific gravity and moisture content, observation of moisture absorption and desorption hysteresis measuring the and measurement of shrinkage and swelling, determination of thermal conductivity calculation, determination of sound adsorption coefficient, dielectric properties and electrical conductivity.	
<b>03 木材鑑別與商用木材</b>	<b>2 必</b>
本課程之目的在使學生了解木材解剖與鑑定之意義、木材之種類及鑑別方法、木材之巨視構造與微視構造及重要商用木材之特徵。針對各地區具有經濟用途及開發潛力的木材特徵與用途。	
<b>03 Wood Identification and Commercial Timber</b>	<b>2R</b>
Introducing the definition of wood anatomy and identification, the methods of identification, the macrostructure and microstructure of wood, the characteristics of important commercial timber.	
<b>04 木材鑑別與商用木材實習</b>	<b>2 必</b>
木材之解剖及鑑定乃在研究木材內部及外部形態之一門科學，對於木材之各種工藝利用，首先必須考慮木材之構造，因此不僅在樹種之鑑定乃必要，同時與其物理及機械性質具密切之關係。本實習課程包括下列項目：木材外觀特徵之觀察、木材鑑定別之方法及標本觀察之準備、商用木材巨視與顯微構造之觀察。	
<b>04 Wood Identification and Commercial Timber Lab.</b>	<b>2R</b>
The anatomy and identification of wood is a science that explores the internal structure and external morphology of wood. The structure of wood must first be taken into consideration with regard to technological utilization of wood. And thus, it is necessary not only in the identification of wood, but also in understanding the physical and mechanical properties of wood. This course mainly consists of the following parts: 1.the methods of wood identification and preparation of specimens, 2.the observation of gross feature and microstructure of commercial timber.	
<b>05 木材化學性質與利用</b>	<b>2 必</b>
本課程旨在講授木材內主要及次要化學組成分之基本知識，詳述纖維素、半纖維素、木質素及萃取成分等之結構性質及利用方法，期使學生充分瞭解影響木材化學性質之機制，進而達成合理化之化學工業應用。	
<b>05 The Chemical Properties and Application of Wood</b>	<b>2R</b>
The course is designed to fulfill the needs of the forest products students to be better acquainted with the fundamental knowledge of various major and minor chemical components in wood. The molecular structure, properties as well as utilization methods of cellulose, hemicellulose, lignin and extractives will	



be fully described to enable students to understand the mechanisms that control the properties and to manipulate those properties to suit industrial needs.	
<b>06 木材化學性質與利用實習</b>	<b>2 必</b>
配合木材化學性質與利用有關理論之介紹，設計八項實習使學生從動手操作中體會各種木材化學成分之不同性質。實習內容包括試材之製備木粉、含水率、水萃取物、1%NaOH 萃取物、灰分、乙醇甲苯萃取物、全纖維素與木質素等之定量分析。	
<b>06 The Chemical Properties and Application of Wood Lab.</b>	<b>2R</b>
Eight labs are established to enable the students fully understand the different properties of various wood chemical constituents lectured in the classroom. The contents include : preparation of testing materials, moisture content determination of wood meal, analysis and determination of water, 1% NaOH and ethanol-toluene extractives, measurement of ash, determination of holocellulose and lignin.	
<b>07 木材乾燥與保存實務</b>	<b>2 必</b>
本課程介紹有關木材之乾燥以及保存處理之性質、原理、實際作業方法，使學生具有實際操作之技術並期獲得最低之處理成本與最佳之成品品質。常用之乾燥方法有氣乾及窯乾兩種方法。而木材保存常用之方法有空胞法(有魯賓法及勞力法)及滿胞法。	
<b>07 Wood Drying and Preservation Practice</b>	<b>2R</b>
This course presents information on wood drying. Related treating properties, principles and practical techniques that can be applied to the drying and preservation of lumber, dimension stock and many special items will be emphasized in order to reduce cost of treatments and maintain high quality of wood products. There are two major wood drying processes (1)Air dry(2)Kiln dry. Also there are two General classes of wood preservatives: such as full-cell (Bethel) and empty-cell (Ruepping) processes.	
<b>08 木材膠合與表面裝飾實務</b>	<b>2 必</b>
本課程之內容設計主要在訓練學生瞭解木材工業常用的膠合劑之種類、反應化學、使用方法、硬化後膠膜性質，以及包括木工塗裝材料、塗裝系統、塗裝機具、特殊塗裝方法、塗裝缺點及其對策等。同時也教導學生木材薄片貼面與實木鑲嵌之實務技能。	
<b>08 Wood Adhesion and Surface Decoration Practice</b>	<b>2R</b>
This course is designed to acquaint students with types of adhesive commonly used in the wood industry, their reaction chemistry, application methods and properties of glued members, and with finishing materials, finishing systems, operating systems, special finishing methods, finishing problems and remedies, etc.. And also to guide student making the practical skills of wood veneer overlay and wood inlay.	
<b>09 木質板應用實務</b>	<b>3 必</b>
本課程旨在傳授學生合板、木芯板、層積材、單板層積材、粒片板及纖維板等以木質材料為原料的初級加工產品(木質複合材料)之性質，使學生瞭解市售木質複合材料之特殊使用性能，充分應用於設計實務，增進材料應用範疇等有關知識。	
<b>09 Wood-Based Processing and Application Practice</b>	<b>3R</b>
This course is designed to acquaint students with types of adhesive commonly used in the wood industry, their reaction chemistry, application methods and properties of glued members, and with finishing materials, finishing systems, operating systems, special finishing methods, finishing problems and remedies, etc.. And also to guide student making the practical skills of wood veneer overlay and wood inlay.	
<b>10 專題製作</b>	<b>3 必</b>
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。	
<b>10 Special topic</b>	<b>3R</b>
The goal of this course is to cultivate students' basic ability through applying and realizing theory into practice.	
<b>11 暑期職場實習(3)</b>	<b>4 必</b>
本課程主旨在讓學生提早體驗職場，建立正確工作態度，藉由至本系相關企業見習與觀摩學習，	

使學校理論教學與實務結合，激發學生學習及進行未來生涯發展規劃，養成專業興趣及就業能力，縮短學用落差。本課程採暑期制施行，需在同一機構連續實習至少為期 2 個月，學生應全職於實習機構實習。	
<b>11 Summer Vacation Profession Workplace Practice (3)</b>	<b>4R</b>
The main purpose of this course is to allow students to experience employment environment and to establish a positive working attitude. The course combines both theory and practice in wood science and design by cooperating with related institutions to provide on-the-job learning opportunities. Students could learn and develop their career plans. Furthermore, the course aims to develop professional interests and employment ability for students to shorten the gap between academic and real employment. The course is available in the summer vacation. It requires the students to participate in internships of the institutions for no less than 2 consecutive months. During the internship period, students should take full-time internships at internship institutions.	
<b>12 學年職場實習(1)</b>	<b>4 必</b>
本課程主旨在讓學生提早體驗職場，建立正確工作態度，藉由至本系相關企業見習與觀摩學習，使學校理論教學與實務結合，激發學生學習及進行未來生涯發展規劃，養成專業興趣及就業能力，縮短學用落差。本課程採學期制施行，需在同一機構連續實習至少為期 4.5 個月，實習期間除依各校訂定定期返校之座談會或研習活動等外，學生應全職於實習機構實習。	
<b>12 Academic year Profession Workplace Practice (1)</b>	<b>4R</b>
The main purpose of this course is to allow students to experience employment environment and to establish a positive working attitude. The course combines both theory and practice in wood science and design by cooperating with related institutions to provide on-the-job learning opportunities. Students could learn and develop their career plans. Furthermore, the course aims to develop professional interests and employment ability for students to shorten the gap between academic and real employment. This course is implemented on semester basis. A continuous internship in the same institution is required for at least 4.5 months. During the internship period, students should take full-time internships at internship institutions, except for scheduled regular seminars or study activities that require students to return to school.	
<b>13 學年職場實習(2)</b>	<b>4 必</b>
本課程主旨在讓學生提早體驗職場，建立正確工作態度，藉由至本系相關企業見習與觀摩學習，使學校理論教學與實務結合，激發學生學習及進行未來生涯發展規劃，養成專業興趣及就業能力，縮短學用落差。本課程採學期制施行，需在同一機構連續實習至少為期 4.5 個月，實習期間除依各校訂定定期返校之座談會或研習活動等外，學生應全職於實習機構實習。	
<b>13 Academic year Profession Workplace Practice (2)</b>	<b>4R</b>
The main purpose of this course is to allow students to experience employment environment and to establish a positive working attitude. The course combines both theory and practice in wood science and design by cooperating with related institutions to provide on-the-job learning opportunities. Students could learn and develop their career plans. Furthermore, the course aims to develop professional interests and employment ability for students to shorten the gap between academic and real employment. This course is implemented on semester basis. A continuous internship in the same institution is required for at least 4.5 months. During the internship period, students should take full-time internships at internship institutions, except for scheduled regular seminars or study activities that require students to return to school.	

## 二、選修科目

<b>14 設計概論</b>	<b>1 選</b>
設計概論為設計領域的基礎必修學科，旨在引導設計系大一學生，在習得設計實踐必備之理論知識與技法之前，先建立有關設計專業領域的基本概念。探討主題將從設計的定義與範圍進行設計探討包括生活設計中的理解與審美、設計教育，透過國內外設計產品賞析培養自身對工業設計的詮釋與美學建立，鼓勵學生從課題中自主思考與學習。	
<b>14 Introduction to Design</b>	<b>1 E</b>

Design Introduction is the basic compulsory subject in the field of design. It aims to guide a university student in design department to establish the basic concepts of design profession before acquiring the theoretical knowledge and skills necessary for design practice. The theme of the discussion will be from the definition and scope of design to explore including understanding of life design and aesthetic education, design education through the appreciation of design products at home and abroad to cultivate their own interpretation of industrial design and aesthetics, to encourage students to think and study independently from the subject.	
<b>15 設計史</b>	<b>1 選</b>
本課程教學主要目的在引出一些設計史的重要設計年代、代表性的設計師思考理念、設計作品和重大設計事件的原由等。藉由歷史觀點，認識「設計」的脈絡演變，進而探討設計的本質。思考歷史的變化過程，設計與社會、政治經濟等社會文化背景之間的因果關係。透過對設計師的了解建構設計與鑑賞設計作品的能力，使學生建立自我批判的能力。	
<b>15 Design History</b>	<b>1 E</b>
The main purpose of this course teaching leads to some important design age of the design history, representative designers to think about ideas, design work and major design events and so on. From a historical point of view, we understand the evolution of “design” to explore the nature of design. Thinking about the process of change in history, design and social, political and economic and other social and cultural causal relationship between. Through the understanding of designers to construct design and appreciation of the ability to design work, so that students build self-critical ability.	
<b>16 木工實習(1)</b>	<b>1 選</b>
本課程旨在提供家具工廠一貫作業所使用的機械之基本原理、操作技術與安全衛生之必須知識，以訓練學生熟知並練習各種機械之正確操作與應用為目的。本課程分為：機械原理及木工機械總論、鋸切機械、鉋切機械、銑削機械、鑽孔機械、成型機械、研削機械、加壓機械(油壓或壓縮空氣機)及加熱設備(含電熱、蒸汽熱源、大電流發熱、微波及高週波發振機等)等之選用、調整、操作及基本維護。	
<b>016 Woodworking Practice (1)</b>	<b>1 E</b>
The topics of this course are to introducing the machinery of furniture manufacture. It includes: the principles of machinery, woodworking machine, safety and healthy of processing. Introducing contents the selection, operating, adjustment and maintain of sawing, jointing, planning, routing, shaping, drilling, moulding, tenoning, sanding (grinding), pressing (by hydraulic or air compressor) and heating (by electronic heater, steam boiler, high current, microwave or high frequency generator) equipments, in this course.	
<b>17 基本設計</b>	<b>1 選</b>
基本設計是學習設計的基礎學科，課程目標在建立美學概念並將設計原理與方法應用於設計，包括平面、立體與空間構成的設計實作。課程內容包含設計概論、設計史、美學原理，並探討設計的造形、色彩、質感、空間、機能等主題。本課程的訓練有助於建立學生正確的美學概念，激發創意思考能力並熟練表現技巧，本課程是學生未來從事空間設計、室內設計、產品設計、工業設計等工作的基礎。	
<b>17 Basic Design</b>	<b>1 E</b>
Basic Design is the introductory course of design studies. The objective of the course is to establish concept of Esthetics and to apply design theory and method to the actual design including the operation in constructing two-dimensional, three-dimensional and space designs. This course content includes introduction to design, the history of design and theory of Esthetics, as well as discussions on themes such as the style, color, material, space and functions of design. Through the training in this course, students will acquire and develop in the concept of Esthetics, creativity and presentation skills. This course is the foundation to all students pursuing a career in space planning, interior design, merchandise design, and industrial design.	
<b>18 基本設計實習</b>	<b>1 選</b>
基本設計實習是配合基本設計課程，讓學生從事基本設計之操作實習，從設計的操作、觀摩與討	



論過程增加對設計的認識與經驗。主要課程內容包含平面造形設計之構成方法與形式，以及立體造形設計之構成方法與形式。本課程之進行以實作與講評討論為主要教學方式，訓練學生將所學到的基本設計原理，藉由各種材料的質感與色彩的操作，具備多元化造形設計表現的能力。	
<b>18 Basic Design Practice</b>	<b>1 E</b>
Basic Design Practicum is combined with the Basic Design course. The practicum allows the students to apply Basic Design in practice. Students will acquire further knowledge and design skills through the practice, demonstration and discussions offered in the practicum. The content of this course includes the method and style in constructing two-dimensional and three-dimensional designs. Lectures will be conducted in the form of a practicum, which will require the students to practice basic design theories with various materials and color schemes, to equip the students with the capability of creative design in various styles.	
<b>19 基礎圖學</b>	<b>1 選</b>
本課程乃相關設計之圖說語言，著重於培訓學生表達及記錄設計與製造所需的觀念與知識，供學生未來從事空間設計、室內設計、產品設計的基礎。其內容包括：繪圖基本技巧、平面幾何圖法、正投影視圖、剖面視圖、輔助視圖、尺度標註與註解、公差與配合、立體圖與透視圖的繪製等，並配合設計圖面練習模型製作。	
<b>19 Basic Graphics</b>	<b>1 E</b>
The universal graphical language used in the related design work is offered in the course. It focuses on training for students in expressing and recording the ideas and information necessary for designing and manufacturing. The course establishes foundation for students in future career development, such as space design, interior decoration design and products design. The content includes basic skill of drawings, descriptive geometry, orthographic projection, sectional views, auxiliary views, dimensioning and marks, tolerance and fits, axonometric drawings and perspective views, etc. In addition, the course includes model making based on design drawing.	
<b>20 專業技術增能實習(1)</b>	<b>1 選</b>
本課程乃相關木藝技術之提升，課程內容以實務操作方向設計，包括實木榫接技法、箱體結構、薄片拼貼、五金按裝等相關技術。以提升本系木藝技優學生實務專業技術與正確工作態度之養成，因應未來職場需求。	
<b>20 Professional Skill Empowerment Practice (1)</b>	<b>1 E</b>
The purpose of this course is to improve students' skills in woodworking, and it is designed to be a practice-oriented course. The content includes techniques of making tenon and joint, laminating, installing accessories, and introduction of cabinet structure. The course aims to improve professional skills of students who are enrolled through special achievement program and cultivate a correct working attitude for them.	
<b>21 職類技能實習(1)</b>	<b>1 選</b>
為鼓勵本系技優學生參加全國技能競賽，本課程乃針對各學生所參與職類競賽提供其專業師資技術指導，如家具木工、門窗木工、油漆裝璜...等相關職類。讓技優學生可增加其本身技能，以爭取獲獎機會。	
<b>21 Practice in Skills of Related Trades</b>	<b>1 E</b>
In order to encourage the department's special achievement-based admission students to participate in the National Skills Competition, the course provides instructions in professional skills for students who participate in the National Skills Competition in related trades, such as Cabinatemaking Trade, Joinery Trade and Painting Trade. The course aims to enhance students' skills to improve their performances in the National Skills Competition.	
<b>22 國際技能競賽實習(1)</b>	<b>1 選</b>
本課程乃針對本系獲選國技能競賽國手，可依各職類國手培訓計畫規畫進行培訓，並可選擇在校或培訓機構加強訓練。提供國手最佳訓練場地及師資，提升技能競賽國手本身技能，以爭取為國爭光機會。	
<b>22 WorldSkills Competition Practice (1)</b>	<b>1 E</b>



This course is designed for students of the department who have been selected to be the national champions to participate in WorldSkills Competition. The content is based on the training plan of champions of each trade, and the champions are allowed to be trained at the school or at training institutions. The course provides suitable training environment and team for champions, aiming to improve their skills to have better performances in WorldSkills Competition.	
<b>23 色彩計畫</b>	<b>1 選</b>
本課程主要講授之重點在於培養學生對色彩的基本認識與激發學生自我的色彩應用技巧。基本上授課內包含：認識色彩、色彩體系、色彩混合與對比、色彩感覺與應用、配色原理與色調分析、色彩計畫的專題製作運用。其次分組報告：同學以自由分組方式對於色彩的使用實例進行研究，並於課堂上發表各組之研究成果，並繳交書面報告及作品呈現。	
<b>23 Color Scheme</b>	<b>1 E</b>
The main focus of this course is to give students a basic understanding of color and stimulate student self-color application skills. Basically, the lectures include: production of knowledge, color system, color mixing and contrast, color perception and application, color matching principle and color analysis, and color planning. The second, group report: students to use free grouping of examples of the use of color research, and in the classroom published research results, and provide a written report and presentation.	
<b>24 木工實習(2)</b>	<b>1 選</b>
本課程旨在提供家具工廠一貫作業所使用的機械之基本原理、操作技術與安全衛生之必須知識，以訓練學生熟知並練習各種機械之正確操作與應用為目的。本課程分為：機械原理及木工機械總論，鋸切機械、鉋切機械、銑削機械、鑽孔機械、成型機械、研削機械、加壓機械(油壓或壓縮空氣機)及加熱設備(含電熱、蒸汽熱源、大電流發熱、微波及高週波發振機等)等之選用、調整、操作及基本維護。	
<b>24 Woodworking Practice (2)</b>	<b>1 E</b>
The topics of this course are to introducing the machinery of furniture manufacture. It includes: the principles of machinery, woodworking machine, safety and healthy of processing. Introducing contents the selection, operating, adjustment and maintain of sawing, jointing, planning, routing, shaping, drilling, moulding, tenoning, sanding (grinding), pressing (by hydraulic or air compressor) and heating (by electronic heater, steam boiler, high current, microwave or high frequency generator) equipments, in this course.	
<b>25 人因設計</b>	<b>1 選</b>
課程規劃以培養學生具有以人類行為與心理之角度去探討產品、介面與互動等相關研究之能力。人因設計為探討人類生理與心理因素，感知、動作與行為之訊息、特性及能力，將之應用在設計上。使產品不但能達成使用者目標，且易於使用，並讓使用者對使用過程滿意，進而產生品牌忠誠度。本課程將介紹針對以產品之人機介面設計與使用者介面為重點，包含人機互動概念、原理與手法，並探討如何融入於產品與系統的設計過程中，設計出更符合人性的產品，進一步提升產品使用性與魅力。	
<b>25 Human Factors Design</b>	<b>1 E</b>
Curriculum planning to develop students with the human behavior and psychological perspective to explore the product, interface and interaction related research capabilities. Human factors designed to explore human physiological and psychological factors, perception, action and behavior of the message, features and capabilities, will be applied to the design. So that the product not only achieve user goals, and easy to use, and allow users to satisfaction in the user's process, resulting in brand loyalty. This course introduces how to design a more human-friendly product that focuses on the design and user interface of human-machine interface, including concepts, principles and practices of human-computer interaction and how to integrate it into the design process of products and systems. Further enhance product usability and charm.	
<b>26 設計表現技法</b>	<b>1 選</b>
設計表現技法課程的主要目的是訓練學生熟練各種圖形的繪製技巧。課程內容包含設計概念與設計圖的表達方法。課程最主要的部分是各種圖形的繪製方法與技巧的熟習。設計表現技法主要是	

作為設計表達的進階訓練，包括平面圖、立面圖、剖面圖及透視圖的繪製。此外本課程也訓練學生配合設計圖面練習模型製作。本課程是學生未來從事空間設計、室內設計、產品設計的基礎。	
<b>26 Design Presentation</b>	<b>1 E</b>
The objective of this course is to familiarize the students with the presentation method of design. Course content includes design concept and the presentation of design in drawing. The core of the course is familiarization of the method and skills of diagrams drawing. Design Drawings Presentation Practicum provides the advance training of presenting design ideas in two-dimensional, three-dimensional, section and perspective drawings, as well as producing. This course is a pre-requisite for students pursuing a career in space planning, interior design, merchandise design, and industrial design.	
<b>27 設計表現技法實習</b>	<b>1 選</b>
設計表現技法實習是配合設計表現技法課程，主要目的是訓練學生熟練各種圖面的繪製技巧。課程內容包含設計概念與設計圖的表達方法。課程最主要的部分是各種圖面的繪製方法與技巧的熟習。設計表現技法主要是作為設計表達的進階訓練，包括平面圖、立面圖、剖面圖及透視圖的繪製。此外本課程也訓練學生配合設計圖面練習模型製作。本課程是學生未來從事空間設計、室內設計、產品設計的基礎。	
<b>27 Design Presentation Practice</b>	<b>1 E</b>
Design Presentation Practicum is combined with the Design Presentation course. The objective of this course is to familiarize the students with the presentation method of design. Course content includes design concept and the presentation of design in drawing. The core of the course is familiarization of the method and skills of diagrams drawing. Design Drawings Presentation Practicum provides the advance training of presenting design ideas in two-dimensional, three-dimensional, section and perspective drawings, as well as producing. This course is a pre-requisite for students pursuing a career in space planning, interior design, merchandise design, and industrial design.	
<b>28 專業技術增能實習(2)</b>	<b>1 選</b>
本課程乃相關木藝技術之提升，課程內容以實務操作方向設計，包括手提電動工具、圓鋸機、帶鋸機、花鉋機、立軸機、作榫機等相關技術。以提升本系木藝技優學生實務專業技術與正確工作態度之養成，因應未來職場需求。	
<b>28 Professional Skill Empowerment Practice (2)</b>	<b>1 E</b>
The purpose of this course is to improve students' skills in woodworking, and it is designed to be a practice-oriented course. The content includes techniques of operating portable power tool, circular saw machine, band saw machine, router, spindle shaper and tenoner. The course aims to improve professional skills of students who are enrolled through special achievement program and cultivate a correct working attitude for them.	
<b>29 職類技能實習(2)</b>	<b>1 選</b>
為鼓勵本系技優學生參加全國技能競賽，本課程乃針對各學生所參與職類競賽提供其專業師資技術指導，如家具木工、門窗木工、油漆裝璜...等相關職類。讓技優學生可增加其本身技能，以爭取獲獎機會。	
<b>29 Practice in Skills of Related Trades (2)</b>	<b>1 E</b>
In order to encourage the department's special achievement-based admission students to participate in the National Skills Competition, the course provides instructions in professional skills for students who participate in the National Skills Competition in related trades, such as Cabinatemaking Trade, Joinery Trade and Painting Trade. The course aims to enhance students' skills to improve their performances in the National Skills Competition.	
<b>30 國際技能競賽實習 (2)</b>	<b>1 選</b>
本課程乃針對本系獲選國技能競賽國手，可依各職類國手培訓計畫規畫進行培訓，並可選擇在校或培訓機構加強訓練。提供國手最佳訓練場地及師資，提升技能競賽國手本身技能，以爭取為國爭光機會。	
<b>30 WorldSkills Competition Practice (2)</b>	<b>1 E</b>
This course is designed for students of the department who have been selected to be the national	

champions to participate in WorldSkills Competition. The content is based on the training plan of champions of each trade, and the champions are allowed to be trained at the school or at training institutions. The course provides suitable training environment and team for champions, aiming to improve their skills to have better performances in WorldSkills Competition.	
<b>31 家具製圖</b>	<b>2 選</b>
本課程主要內容在訓練學生針對家具產業繪圖技術人員的職能強化，課程中由桌、椅、櫃、廚、床與生活用品的設計圖繪製到結構設計探討分析後的工作圖繪製，再由工作圖解構後的生產零件圖繪製與裝配組合圖繪製技巧訓練。	
<b>31 Furniture Drawing</b>	<b>2 E</b>
The main content of this course is to train students who reinforce the functions of drawing technicians in the furniture industry. The courses training the design from the sketch of tables, chairs, cabinets, kitchens, beds and household products which could be converted to the working drawings for the analyzing and analyzing structural designs. Furthermore, the graphical production after the production of parts drawing and assembly combination drawing skills training.	
<b>32 電腦輔助設計(1)</b>	<b>2 選</b>
本課程以教導學生學習與使用電腦 3D 繪圖軟體，使同學具備製作出各式各樣的電腦 3D 模型，並應用於設計課程中。且藉由對不同案例的繪製練習，讓學生們更能充分運用電腦 3D 繪圖軟體的優點，加以整合設計出出色的作品來。	
<b>32 Computer Aided Design (1)</b>	<b>2 E</b>
Guiding the students familiar with skills using computer 3D drawing software. Training the attendants to handle or create various types of 3D models and applied to design courses. The attendants can fully employ the advantages of computer 3D sketch software through the practice on several different case studies and produce an integrated design project.	
<b>33 家具製作實習(1)</b>	<b>2 選</b>
本課程以配合同學學習的背景及技術能力等因素，實地設計製作自己擅長的木藝作品，並幫助學生具備家具木工乙級技術士的技能。課程中訓練學生有關帶鋸機、圓鋸機、角鑿機、鑽孔機、懸臂鋸、花刨機等木工機具使用。教導木材高階之榫接技術、拼板技術、封邊技術，並透過實際製作桌子，訓練同學木工操作技能，培養個人品質要求素質及熟練度。	
<b>33 Furniture Manufacturing Practice(1)</b>	<b>2 E</b>
This course is aimed at training the students having the ability to design and to make out the wood works which they want and like to do. The purpose is to enhance the students' ability to pass the B grade qualification held by the Committee of Labors. The course offers students the training in using woodworking machines including band saw, circular saw, drilling machine, overhang saw, router and the other basic tools. Advanced woodworking techniques including connection of joints, lumber assembly, and edge sealing are highlighted in the course. Each student will be asked to make a wood table as a practice training of woodworking skill and quality control.	
<b>34 智能加工技術精進實習(1)</b>	<b>2 選</b>
本課程主旨在讓學生學習智能化加工原理及機械操作技術，課程內容有智能化的基本組成知識，如物聯網、大數據、雲端計算、自動化等基本概念。自動化數值控制機械的基本操作技術，如機械操作介面設定、加工圖面繪製、刀具規畫、路徑規畫等等，讓學生了解智能化加工的應用範圍。	
<b>34 Intelligent Proccessing Technique Improvement Practice (1)</b>	<b>2 E</b>
The course aims to allow students to be familiar with the principle of intelligent processing and operation of machines. In order to allow students understand the application of intelligent processing, the content includes basic knowledge of intelligent processing, such as IoT, big data, cloud computing and automation. In additon, it also includes basic techniques to operate automative machine, such as setting of interface, drawing of processing draw, planning of cutter and planning of routing.	
<b>35 暑期職場實習(1)</b>	<b>2 選</b>
本課程主旨在讓學生提早體驗職場，建立正確工作態度，藉由至本系相關企業見習與觀摩學習，使學校理論教學與實務結合，激發學生學習及進行未來生涯發展規劃，養成專業興趣及就業能力，	



縮短學用落差。本課程採暑期制施行，需在同一機構連續實習至少為期 2 個月，學生應全職於實習機構實習。	
<b>35 Summer Vacation Profession Workplace Practice (1)</b>	<b>2 E</b>
The main purpose of this course is to allow students to experience employment environment and to establish a positive working attitude. The course combines both theory and practice in wood science and design by cooperating with related institutions to provide on-the-job learning opportunities. Students could learn and develop their career plans. Furthermore, the course aims to develop professional interests and employment ability for students to shorten the gap between academic and real employment. The course is available in the summer vacation. It requires the students to participate in internships of the institutions for no less than 2 consecutive months. During the internship period, students should take full-time internships at internship institutions.	
<b>36 成本估算與報價</b>	<b>2 選</b>
本課程係提供學生有關利潤與成本觀念，並進而估算、分析和控制製品之成本，以增加對經營者之信心。其講授內容包括有：成本結構的要素與分類、成本估算的步驟、如何估算材料成本、如何估算人工成本、如何估算製造費用、如何估算銷售費用、如何決定產品的總成本與單位成本、緊急訂單的產品如何估算成本、成本估算與事前降價成本規劃、成本估算與產品報價策略等等。	
<b>36 Cost Estimates and Quotes Price</b>	<b>2 E</b>
The aim of this course is training the students about the concept of profit and costs, and thus estimating the cost, analysis and control products, in order to increase the confidence of the operators. It's offered to cover: Factor and classification on cost structure, Cost estimating steps, How to estimate materials cost, How to estimate labor cost, How to estimate manufacturing expenses, How to estimate selling expense, How to determine total cost and unit cost on the product, How to estimate the product cost under emergency orders, Cost estimates and cost price reduction plan in advance, Cost estimates and product quotes strategy, and so on.	
<b>37 電腦輔助設計(2)</b>	<b>2 選</b>
本課程以教導學生學習與使用電腦 3D 繪圖軟體，使同學具備製作出各式各樣的電腦 3D 模型，並應用於設計課程中。且藉由對不同案例的繪製練習，讓學生們更能充分運用電腦 3D 繪圖軟體的優點，加以整合設計出出色的作品來。	
<b>37 Computer Aided Design (2)</b>	<b>2 E</b>
Guiding the students familiar with skills using computer 3D drawing software. Training the attendants to handle or create various types of 3D models and applied to design courses. The attendants can fully employ the advantages of computer 3D sketch software through the practice on several different case studies and produce an integrated design project.	
<b>38 家具設計</b>	<b>2 選</b>
本課程主要著重於引導學生從設計、專門方案到家具成品之完整設計過程的觀念。講授內容包括：（一）設計觀念的發展。（二）定義設計產品的範疇。（三）產品使用的功能標準。（四）研擬計畫書。（五）組件材料的選擇。	
<b>38 Furniture Design</b>	<b>2 E</b>
This course is intended to be a practical guide to planning processes, of concept through design, shop plans and finishes. A sequence of the custom furniture design process is presented in the following chapters: (1) Developing the concept — A menu of ideas from what has been done before, or created in your own style — get the creative juices flowing. (2) Defining the scope — Temper the concepts with the realities of your resource — time, interest, capabilities and shop space—for the level of complexity. (3) Applying standards — Follow or depart from convention. Look at size and stature of the user-pleasing proportions, style relationships. (4) Committing to paper — Lock in your design, adapting plans and photos, preplanning construction steps. (5) Converting to parts — Select best woods, mill cuts, joinery techniques.	
<b>39 家具製作實習(2)</b>	<b>2 選</b>
本課程以配合同學學習的背景及技術能力等因素，實地設計製作自己擅長的木藝作品，並幫助學	



生具備家具木工乙級技術士的技能。課程中訓練學生有關帶鋸機、圓鋸機、角鑿機、鑽孔機、懸臂鋸、花刨機等木工機具使用。教導木材高階之榫接技術、拼板技術、封邊技術，並透過實際製作桌子，訓練同學木工操作技能，培養個人品質要求素質及熟練度。	
<b>39 Furniture Manufacturing Practice(2)</b>	<b>2 E</b>
This course is aimed at training the students having the ability to design and to make out the wood works which they want and like to do. The purpose is to enhance the students' ability to pass the B grade qualification held by the Committee of Labors. The course offers students the training in using woodworking machines including band saw, circular saw, drilling machine, overhang saw, router and the other basic tools. Advanced woodworking techniques including connection of joints, lumber assembly, and edge sealing are highlighted in the course. Each student will be asked to make a wood table as a practice training of woodworking skill and quality control.	
<b>40 智能加工技術精進實習(2)</b>	<b>2 選</b>
本課程主旨在讓學生學習智能化加工原理及機械操作技術，課程內容有智能化的基本組成知識，如物聯網、大數據、雲端計算、自動化等整合概念。自動化數值控制機械的操作技術，如機械操作介面設定、加工圖面繪製、刀具規畫、路徑規畫、多軸加工等，讓學生了解智能化加工的技術整合及應用範圍。	
<b>40 Intelligent Proccessing Technique Improvement Practice (2)</b>	<b>2 E</b>
The course aims to allow students to be familiar with the principle of intelligent processing and operation of machines. In order to allow students understand the application of intelligent processing, the content includes basic knowledge of intelligent processing, such as IoT, big data, cloud computing and automation. In additon, it also includes basic techniques to operate automative machine, such as setting of interface, drawing of processing draw, planning of cutter and planning of routing.	
<b>41 木材設計力學</b>	<b>3 選</b>
首先教導材料之基本應力及應變觀念以及求解方法，包括平面至三維之應用。導入向量觀念求解及物件受力之靜力問題求解，同時探討基本結構受力靜定求解方法。其次教導木材基本之抗拉、抗彎、抗壓、抗剪特性，以及相關之影響因子。同時，瞭解木材在工程應用容許強度之推導以及安全係數之觀念。	
<b>41 Mechanics for Wood Design</b>	<b>3 E</b>
Introduces the concepts of stress and strain of materials and the related solving approaches. The application on plane and three dimension cases are covered. The vector concept is introduced to solve static problems for objects subjected to external forces. Basic determinant problems for simple structure are covered. The fundamental characteristics of tensile strength, bending strength, compressive strength, and shearing strength of wood materials with related influential factors are demonstrated. The derivation of allowable stress and the concept of safety factor in the engineering application for wood are guided.	
<b>42 木質材料自動化加工</b>	<b>3 選</b>
傳授木材工業自動化加工之基礎知識，簡介機械視覺、自動演算及數值控制等概念。主要內容為教導木工用電腦數值控制加工機，含數值控制基本觀念、電腦數值控制花鈹機之指令、程式設計、定位模之製作、立體圖文繪製及加工，雷射加工機之應用軟體、向量圖、點陣圖、外框、封閉區塊、開口區塊、交叉區塊、雷射切割及雷射雕刻，立體圖文自動轉換及逆向工程設備之應用等。培養學生成為自動化加工知行能力兼備的專業人才	
<b>42 Automated Processing for Wood-based Materials</b>	<b>3 E</b>
Introducing the state of art for woodworking processing automation, machine vision, automatic computing, numerical control and related background. The topics covers programming practice for (computer) numerical controlled machine, components of woodworking CNC router, and fundamental procedures on programming numerically, operations of Laser engraver, CNC router and relate application.	
<b>43 木質材料自動化加工實習</b>	<b>3 選</b>
訓練學生具備自動化加工之基本知識及實務應用電腦數值控制加工機械、電腦輔助軟體及立體物件逆向工程等能力。設計為校內實習，練習自動化加工用電腦軟體、機械視覺逆向工程設備、電腦數值控制花鈹機及雷射加工機；校外實際參與生產線，見習木料自動鋸切與分配系統、自動演	

算裁板系統、數控花鉋機、全自動木質板加工系統及化妝單板生產線等。	
<b>43 Automated Processing for Wood-based Materials Practice</b>	<b>3 E</b>
Training students to know the automation related background. The topics cover campus courses and furniture factor courses. Campus courses: learning the computer programs, operations of machine vision equipment, CNC router and Laser engraver. Furniture factor courses: automatic sawing and admeasuring system, automatic computing system of panel sawing, NC router, panel processing automation system and the production line for fancy veneer.	
<b>44 電腦輔助製圖實習</b>	<b>3 選</b>
本課程以電腦輔助設計製圖實務為基礎背景，在熟悉電腦繪圖軟體操作及應用後，進階瞭解數位軟體在產品設計概念發想到量產製造之配合，以及運用於生產設備之輸出製作。本課程以強化軟體應用和加工製成等方面之知識和技術為主，並提升學生專業能力。	
<b>44 Computer Aided Manufacture Practice</b>	<b>3 E</b>
The basic background of this course is computer aided design and drawing practice. In this course we give student to know how to apply the different digital software in the process of product design to manufacture, and input material parameters to manufacturing facility to finish the product. This course is to enhance student's ability of software application and product process.	
<b>45 家具製造程序</b>	<b>3 選</b>
本課程之主旨除了探討一般有關家具的製造技術外，更積極培養訓練學生對家具製造之程序、生產速度及各種工廠設備與製造系統之整合觀念，使學生能靈活運用在實際家具的生產作業。其講授內容包括：家具工業概況、家具工廠組織、木料之進廠、儲存及乾燥、配料間的加工、配料間的木料利用、配料間的生產、薄片間及其加工、細作間及其生產管制、組合間作業、塗裝間作業、打蜡及包裝間作業、倉儲運輸管理、製作家具之成本分析等。	
<b>45 Furniture Manufacturing Processes Practice</b>	<b>3 E</b>
The intent of the course is to enable students to develop techniques and integrated manufacturing concepts in the furniture industry. It covers: introduction of the furniture industry, organization of a furniture factory, lumber receiving, storage and drying, process, lumber utilization, production of parts at the rough end, veneering components, machining parts, production control, assembly, finishing methods, the finishing conveyor, rubbing and packing, warehousing and shipping, the cost of manufacturing furniture, and so on.	
<b>46 專業技術精進實習(3)</b>	<b>3 選</b>
本課程乃相關木藝技術之提升，課程內容以實務操作方向設計，包括桌、椅、櫃等相關製造技術。以提升本系木藝技優學生實務專業技術與正確工作態度之養成，因應未來職場需求。	
<b>46 Professional Skills Improvement Practice (3)</b>	<b>3 E</b>
The purpose of this course is to improve students' skills in woodworking, and it is designed to be a practice-oriented course. The content includes techniques of making table, chair and cabinet. The course aims to improve professional skills of students who are enrolled through special achievement program and cultivate a correct working attitude for them.	
<b>47 暑期職場實習(2)</b>	<b>3 選</b>
本課程主旨在讓學生提早體驗職場，建立正確工作態度，藉由至本系相關企業見習與觀摩學習，使學校理論教學與實務結合，激發學生學習及進行未來生涯發展規劃，養成專業興趣及就業能力，縮短學用落差。本課程採暑期制施行，需在同一機構連續實習至少為期 2 個月，學生應全職於實習機構實習。	
<b>77 Summer Vacation Profession Workplace Practice (2)</b>	<b>3 E</b>
The main purpose of this course is to allow students to experience employment environment and to establish a positive working attitude. The course combines both theory and practice in wood science and design by cooperating with related institutions to provide on-the-job learning opportunities. Students could learn and develop their career plans. Furthermore, the course aims to develop professional interests and employment ability for students to shorten the gap between academic and real employment. The course is available in the summer vacation. It requires the students to participate in internships of	

the institutions for no less than 2 consecutive months. During the internship period, students should take full-time internships at internship institutions.	
<b>48 設計行銷與管理</b>	<b>3 選</b>
本課程以經營戰略的角度於設計過程中導引學生技術創新與新產品開發活動，並密切關注建立開放的組織架構以吸納全方位的創新資源，強調設計企業的知識管理和知識產權管理。同時還吸納了當今創新非常重要和關鍵的開放式創新的思考和企業間動態聯盟的思想，並準備了足夠的案例幫助學習與實踐創新管理的模式。課程內容涵蓋 3 個主題：創新管理的概念、技術與知識管理與新產品開發和行銷。	
<b>48 Marketing and Management for Design</b>	<b>3 E</b>
The aim of this course is training the students how to operate a strategic of the design processes. To guide the students the technological innovation and the new product development. To establish an open organizational structure which could absorb the full range of innovative resources, emphasizing the design of enterprise knowledge management and intellectual property management. Furthermore, a dynamic critical thinking and open innovation ideas become very important capability today. And through the cases study help the students learning and practicing the innovation management model. The course will covers three topics: the concept of innovation management, technology & knowledge management and new product development & marketing.	
<b>49 展示設計</b>	<b>3 選</b>
本課程的目在於介紹一個裝飾藝術的領域，包括臨時的節日裝飾的街道，公共廣場，門面修飾，公眾假期，遊行，實物解說的裝飾和展示的設計，以及各類展覽型態等。	
<b>49 Display and Exhibit Design</b>	<b>3S</b>
The purpose of this course is to introduce a field of the decorative arts that includes the temporary festive decoration of streets, public squares, window dressing, public holidays, parades, the design of decorations and displays for demonstrations, and various types of exhibitions.	
<b>50 職業安全與衛生</b>	<b>3 選</b>
介紹有關職業安全與衛生的法規概要，通盤探討一般的職業安全與衛生，再聚焦於木材設計與製造專業上的安全與衛生問題。通論內容旨在培養職場上發揮合作並有執行力的多元職能，聚焦內容在培育本系專業人才面臨新科技的時空及人員等的變革之際，應用專業知識跨領域解決新產生的安全與衛生困擾的基本能力。講授內容有職業安全與衛生法規概要，工地、工廠及危害物等屬於地點性質的安全管理，個人安全護具，機具之安全管理及維護。衛生內容除了職業衛生概要之外，另以影響木材產業從業人員的健康管理為主點。	
<b>50 Occupational safety and health</b>	<b>3 E</b>
To introduce occupational safety and health, discuss the topics in general, and focus on the safety and health issues in wood design and manufacturing. The purpose of the general seminar is to cultivate a multi-functional role of cooperation and execution in the workplace. Focusing on train students develop the abilities of interdisciplinary to solve the problems of safety and health issues, base on the expertise when the technologies and personnel were changed. Lectures include outline of Occupational Safety and Health Act, safety management of workplace, factories and hazardous materials, personal protective equipment, safety management and maintenance of machines. The management of Health contents in addition to profiles, and other point is the effects wood and processing of wood on the health.	
<b>51 專業技術精進實習(4)</b>	<b>3 選</b>
本課程乃相關木藝技術之提升，課程內容以實務操作方向設計，包括家具設計、結構研發、製程規畫、行銷策略等相關技術。以提升本系木藝技優學生實務專業技術與正確工作態度之養成，因應未來職場需求。	
<b>51 Professional Skills Improvement Practice (4)</b>	<b>3 E</b>
The purpose of this course is to improve students' skills in woodworking, and it is designed to be a practice-oriented course. The content includes furniture design, structure development, process planning and marketing strategy. The course aims to improve professional skills of students who are enrolled through special achievement program and cultivate a correct working attitude for them.	



# 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

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。

262001 Biometry

2 R H. L. Chang F

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.

#### 262002 生物統計實習

1 必 張秀鑾 上

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。

262002 Practice of Biometry

1 R H. L. Chang F

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.

#### 262003 實務專題

2 必 全系教師 上、下

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。

262003 Special Projects

2 R Faculties F、S

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.

#### 262004 動物學

2 必 沈朋志、彭劭于 上

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。

262004 Zoology

2 R P.C. Shen, S.Y Peng F

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.

#### 262005 動物學實習

1 必 彭劭于 上

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。

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 鄭富元 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 F. Y. Cheng 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

2 必 余祺、楊國泰 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 2 R C. Yu, K. T. S Yang

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 食品系 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 Dept. of Food Science 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 鄭富元 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 F. Y. Cheng 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 2 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 2 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 余祺 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 C. Yu 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**

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****余祺 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****C. Yu 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****余祺 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****C. Yu 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 1 R H. H. Wu F

## Dairy Livestock

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 黃自毅 下

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 T. Y. Huang S

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 黃自毅 下

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 T. Y. Huang S

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 Animal Feeding and Management 2 E H. H. Wu F

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.

### **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, fat, 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 鄭富元 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 F. Y. Cheng 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 鄭富元 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 F. Y. Cheng 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 鄭富元 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 F. Y. Cheng 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 鄭富元 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 F. Y. Cheng 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 Animal Products Management 2 E C. M. Chen F

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 吳錫勳 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 H. H. Wu 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 下

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 S

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 吳錫勳 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 H. H. Wu 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 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 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 Management 2 E R. C. Weng F

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 1 選 陳志銘 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 1 E C. M. Chen 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 2 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 2 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





**262071 反芻動物健康與管理****2 選****吳錫勳、楊國泰 下**

介紹反芻動物從出生至上市這段期間如何維持並改善泌乳反芻動物的健康與管理，包含腳蹄健康及繁殖障礙排除、常見代謝性疾病的預防、乳房炎防治、行為觀察及牧場環境設施等，藉由講演、投影片及影片的放映，使學生能夠對反芻動物的健康與管理有深入的瞭解。同時使學生認知經營反芻動物須具備行為觀察判斷動物生理健康狀況及改善環境設施的知識及能力，在兼顧動物福利的原則下提升牧場的經濟效益

262071 The Health and Management of  
Ruminant

2 E

H. H. Wu, K. T. S  
Yang

The course is focus on how to maintain and improve the health and management of ruminant from born to market. This subject is associated with healthy foot, reproductive disorder exclusion, metabolic disease prevention, behavior observation and pasture environment facilities design, etc. For students to realize the importance of the healthy ruminant and farm management, the lecture, power point, textbook and movies are employed. Meanwhile, under the principle of animal welfare and increase economic effect, students need to possess the preliminary knowledge of behavior observation and ability to assess the health situation of ruminant and to improve the farm facilities after finish this course.

**262072 反芻動物健康與管理實習****1 選****吳錫勳、楊國泰 下**

本實習課程主要目的是使學生了解反芻動物健康對牧場經營之重要性，如生長發育之營養條件、體態評分與行為觀察、配種適期與人工授精、懷孕診斷與產後子宮復舊、擠乳設備與乳房炎防治、常見代謝性疾病的認知與預防、用藥時機與淘汰機制等，透過實務操作，發掘問題，解決問題，以達到酪農場經營管理最大效益。

262072 The Health and Management of  
ruminant Practices

1 E

H. H. Wu, K. T. S  
Yang

The purpose of this internship course is to enable students to understand the importance of ruminant health to ranching operations. For example, nutritional conditions for growth and development of ruminant, observation of body scores and behaviors, appropriate mating duration and artificial insemination, diagnosis of pregnancy and postpartum uterine involution, treatment of milking equipment and mastitis, recognition and prevention of metabolic diseases, timing of drug use and elimination mechanism, etc. Through practical operations, we will explore problems and solve problems to achieve the maximum benefits of operating and managing ruminant farms.

**262073 屠體分切與應用實習****1 選****陳志銘 下**

本課程內容以學習豬、牛、雞等禽畜屠體部位分切及應用之相關技術與實務操作訓練為主，將依各國屠體與食肉等級評定的標準及方法探討屠體評級之相關技術與實務訓練，以了解判定屠體之組成與價值。進而介紹屠體分切標準及技術之相關技術與實務訓練，以解說不同部位肉之品質，及其品質判定之方法與標準。依據食肉可口性與產量之相關技術與實務操作訓練，說明屠體與部位肉等級評定之運作，並且討論各部位肉於中式加工品與西式料理之應用。。

262073 Laboratory Practices for Carcass  
Cutting and Application of Meat Parts

1 E

C. M. Chen S

This course focuses on the relative technology and practical practices for the cutting of pork, beef cattle, and chicken carcasses as well as the application of carcass parts. The carcass evaluation and cutting standards will be introduced the relative technology and practical practices for the carcass cutting and carcass grading according to Taiwanese, American, and Japanese regulations. It will introduce the technology and practical practices how to grade the carcasses by quality parameters. The best use of meat on Chinese meat products and Western cuisines will be discussed.

傳閱附件 4---機械工程系「110 學年度產學攜手-精密加工專班」課程大綱

## 機械工程系(產學攜手合作專班)(110 學年度入學適用)

### Department of Mechanical Engineering

#### 一、必修科目 Required Courses

##### 22746~22753 產業實務實習(1)~(8) 4,必

落實學生學以致用，並加強縮短四技學程的學生學用落差，而進行培育相關實務工作經驗之一系列實習課程。

##### 22746~22753 Professional practice(1)~(8) 4,R

Through this course, students can apply their knowledge to implement and cultivate a series of relevant practical work experience in this internship programs.

##### 05022 普通物理(1) 3,必

一、力學：

1.等加速運動 2.牛頓運動定律 3.靜平衡 4.功與能 5.線動量 6.轉動運動 7.轉動功與能。

二、熱力學：

1.第零定律 2.熱與功 3.第一定律 4.第二定律。

##### 05022 General Physics (1) 3,R

1.Mechanics：

(1).Uniformly Accelerated Motion (2).Newton's Laws of Motion

(3).Static Equilibrium (4).Work and Energy

(5).Linear Momentum (6).Motion in A Circle

(7).Rotational Work Energy and Momentum

2.Thermodynamics：

(1).The Zeroth Law of Thermodynamics

(2).Temperature and The Kinetic of Gases

(3).The First Law of Thermodynamics

(4).The Second Law of Thermodynamics

##### 05023 普通物理實驗(1) 1,必

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

##### 05023 普通物理學實驗(1) 1,R

General Physics Lab. (1)

1.Fundamental measurement

2.Free falling body

3.Single pendulum

4.Friction

5.Components of force

6.Collision

7.Surface tension

8.Specific heat of solid

9.Specific heat of liquid

10.Linear expansion

##### 22396 能源概論

3,必

人類的永續發展之重大因素之一便是能源，包括：化石燃料、核能及再生能源。但是，因為地球資源貯存量有限，如果沒有適當的能源節制及恰當的再生能源技術，進而有效的能源管理政策，不但有害於經濟的發展，也會造成能源缺乏，引起全球人類與社會衰退。

提升能源環保技術及管理的基本步驟是奠定具有整體觀的能源環保之教育，具有科技、管理、經濟整體觀，因此本課程之內容涵蓋了過去、現在及未來的能源技術、能源種類、能源經濟及管理問題、等等。本課程探討各議題加以說明，並指出未來的可能展望。對我國的能源現況加以分析，也探討近代能源之環保議題，因此應用範圍極廣。本課程主要的內容為：

- 1 簡介
- 2 能源概論
- 3 化石燃料
- 4 核能
- 5 太陽、風與地熱能
- 6 水力發電與海洋能
- 7 生質能
- 8 氫能與燃料電池
- 9 發電科技
- 10 能源與環境

### **22396 Introduction to Energy 3,R**

Energy is the key issue of whether human race and all the other lives can be sustained or not in earth for the future. Energy resources usually includes: fossil fuel, nuclear power, and renewable energy. However, since the energy stored in earth is limited, it can be dissipated very quickly and inefficiently if governments/citizens of countries are not aware of the basic ideas and do not have a good knowledge or policy of energy usage management. An inefficient way (or, in a wrong way) of the energy usage will definitely bring in the result of economy recession or depression, civilization development backward, and even to the disaster of human races annihilation.

Therefore, in this course, we provide the knowledge of energy education from different prospects and point of views, introduce the idea and techniques of how to preserve and use energy efficiently. Also the issues of environment protection related with energy usage and storage methods. Main subjects discussed will be:

1. fossil fuel
2. nuclear energy
3. solar, wind, geothermal energy
4. hydraulic energy (hydroelectric power、marine current and Tidal energy)
5. bioenergy(biofuel)
6. hydrogen energy and fuel cell
7. basic principle of electric generation
8. issues of environment protection

### **22222 基礎數學 3,必**

本基礎數學課程是針對幾個學習微積分所需理解的重要概念而設計。這門課程可提供學生代數與三角函數紮實的基礎。主要的內容包含了線性、多項式、片斷、指數、對數與三角函數的觀念介紹。此外，簡單的矩陣運算亦會在課程中介紹。學生將會學習如何以符號、圖型和數值方法來操作這些函數。

### **22222Fundamental mathematics 3,R**

This fundamental math course focuses on various topics that are important to the study of calculus. Through this course students will acquire a solid foundation in algebra and trigonometry. The topic is placed on understanding the concepts of linear, polynomial, piecewise, exponential, logarithmic, and trigonometric function. In addition, simple matrix operation will be covered in this course. Students will learn to work these functions in symbolic, graphical, and numerical form.

### **22394 熱學工程概論 3, 必**



本課程要旨為介紹熱力學與熱傳學中的基本概念、各種現象及實際工程上的應用，並以有限元素軟體輔助教學實習。內容包含：基本概念，特性與狀態，熱力學第一定律，熱力學第二定律、熱機原理(封閉循環: Carnot Cycle, Otto Cycle, Diesel Cycle，內燃機/四衝程引擎,外燃機，冷凍原理)，熱傳學中的熱傳導(擴散方程式、穩態分析、散熱片、暫態分析)、對流理論簡介(強制與自然對流)。本課程同時教授學生利用電腦以及計算(數值)方法，配合商用有限元素軟體 COSMOS/M 與 Gambit-ANSYS/Fluent 將熱傳學中的實際工程問題，在電腦中進行視覺性的探討與整合分析。本課程教學重點在於如何在電腦中建模、切割網格、設定合理的邊界條件、求解、分析結果。應用：散熱片分析和設計原理、IC 封裝/電子產品之散熱、殼管式熱交換器之對流熱傳分析、內燃機之散熱分析，輻射熱傳和相變化:雷射切割的分析(材料的融化)。

練習的實際工程問題包含：

1. 散熱片設計
2. IC 封裝/電子產品之散熱
3. 殼管式熱交換器之對流熱傳分析
4. 內燃機之散熱分析

### **22394 Introduction of Thermal Engineering 3, R**

The purpose of this course is to give undergraduate students a solid knowledge about the basic principles of thermal engineering, which involves knowledge of thermodynamics and heat transfer. The contents of this includes: fundamental concepts, first and second laws of thermodynamics, thermodynamic cycles and heat transfer principles. Also included in this course is an introduction of software as ANSYS/FLUENT which help students use the computer/numerical methods to solve real world heat transfer problems.

The contents of heat transfer include:

- 1.Introduction of heat transfer.
- 2.Application of heat transfer.
- 3.heat conduction.
- 4.heat convection.
- 5.heat exchange design.
- 6.thermal radiation.

### **40006 工程圖學實習 1, 必**

本課程使學生瞭解 CNS 工程製圖之標準與方法，培養學生識圖的能力，並能應用投影與展開原理，正確、清晰、美觀、迅速繪製各種機械工作零件與組合圖，並使學生熟悉各種平面與立體繪圖的觀念與技術技能，養成圖學表現與溝通的實務應用能力。

### **40006Engineering Graphics and Practice 1,R**

This course enables students to understand the CNS standard and methods of engineering drawing, and cultivate students to have the abilities of knowing graphics and to apply the principles of projection and expanding for drawing various mechanical parts and assemble graphics. Moreover, this course familiarize students with a variety of two- and three-dimensional graphics concepts and drawing skills, and equip students with the ability to develop practical applications and drawing communications.

### **322005 應用力學 3,必**

本課程之目的主要是介紹基本的力學觀念及原則，包括了質點靜力學、剛體的等效力系、剛體平衡、均佈力，以及結構的分析。

### **322005 Statics 3,R**

The coverage of this course includes fundamental concepts and principles of mechanics ; statics of particles ; equivalent systems of forces for rigid bodies ; equilibrium of rigid bodies ; distributed forces ; and analysis of structures.

### **22291 電腦輔助機械製圖 3, 必**

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。

22291 Computer-aided Mechanical Drawing 3, R

This course equips students with regular operations on the mechanical engineering drawing and the use of computer-aided mechanical drawing. Students are trained to acquaint the mechanical drawing and to use the projection method to complete mechanical drawing by AutoCAD and SolidWorks software. This course trains students to understand the concept and technique of CAD and to possess the skill of practical application on CAD.

## **20048 工廠實習 2, 必**

本課程內容包含工廠規則及安全規定說明，加工零組件之組合成成品，及兩大類別之實習項目：(1)鋸削及砂輪機，車床，鑽床及銑床，磨床和數控工具機之操作。(2)砂模鑄造，精密鑄造，銲接，熱處理，板金加工和鉗工。

**20048 Machine Shop Practice 2,R**

The content of this course include the description of the usage rules and safety requirements, to assembly the fabricated components to be a product, and two group items : (1)The operations of band machining and hard polishing, engine lathe, drilling and milling machines grinders, and numerical control machine tools. (2)Sand casting, precision casting, welding, heat treatment, sheet forming, and bench work

## **40306 材料力學 3,必**

本課程介紹的主題有受軸向力、扭力及彎矩等作用之構件的分析及設計，並包含應力、應變、彈性及非彈性行為和應變能的基本觀念。其它一般性主題包含應力與應變的轉換，應力集中，樑之撓度，柱之行為和能量法。特殊主題則有熱效應，預應變效應，壓力容器，非等截面構件，不連續函數，剪力中心和非彈性彎曲。

40306 Mechanics of Materials 3,R

The topics introduced in this course include the analysis and design of structural member subjected to axial load, torsion and bending, as well as such fundamental concepts as stress, strain, elastic, and inelastic behavior, and strain energy. Other topics of general interest are the transformation of stress and strain, stress concentrations, deflections of beam, behavior of columns, and energy methods. More specialized topics are thermal and prestrain effects, pressure vessels, nonprismatic members, discontinuity functions, shear center. and inelastic bending.

## **21350 材料實驗 1,必**

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。本課程探討傳統及近代陶瓷的原料特性、基本物理性質檢測、及各種不同成形法。基本物性測試包括；粒度測試、密度測試、及黏度測試。成形法的課程內容有；泥陶瓷粉末之分散實驗、陶瓷粉末注漿成形法、理論密度量測與計算、陶瓷薄帶的製造等。本課程除傳授相關的知識背景外，並特別強調學生的實作與參與使學生認識陶瓷製造的基本過程，包括傳統陶瓷，結構陶瓷，及玻璃等製程。另外，藉由 SEM 與 XRD 的分析，也使學生了解陶瓷材料在燒結後顯微結構的變化。

**21350 Fundamental Experiments in Materials 1,R**

This course is designed to introduce the ceramic, basic reaction principles and fundamental approach of analysis of the inorganic substance occurred. The content includes the dielectric properties and compositions of ceramics. The experiment is designed to introduce students to the knowledge and implementation of characteristics of ceramics by microstructural analysis, particle dispersion, packing density, theory density calculation and sintering kinetic.

## **21570 機械製造 3, 必**

本課程介紹機械元件之製造原理與方法，著重系統化之說明。製造對象包含金屬、高分子、陶瓷及半導體等材料，製造方法包含鑄造、塑性成形、切削、銲接、熱處理、表面處理、粉末冶金及非傳統加工等。探討重點在於結合材料之特性及設計之理念，輔以工具機、工模夾治刀具及量測與檢驗的知識，配合生產管理及電腦輔助製造系統之學理與實務，建立一完整性之製造系統觀念。

**21570 Manufacturing Processes and Systems 3,R**

This course introduces the manufacturing principles and methods of the mechanical components, emphasizing on the systematic descriptions. The discussed materials include metals, polymers, ceramics and semiconductors. The manufacturing methods include casting, plastic deformation, machining, welding, heat treatment, surface treatment, powder metallurgy and nontraditional processes. The investigation of material properties and design concepts are discussed. In addition, the knowledge of machine tools, jigs, fixtures and tools, and metrology and inspections are discussed. The comprehensive manufacturing concept is built by combining the principles and techniques of the production management and computer-aided manufacturing systems.

**20036 工程材料 3, 必**

概論、原子結構與鍵結、晶體結構與缺陷、相平衡、材料物化性、材料強化、金屬材料、陶瓷材料、聚合材料、複合材料、磁料、電性、材料使用與選擇。

**20036 Materials Science and Engineering 3, R**

Introduction , atomic structure and bonding. Crystal structures and imperfections, phase diagrams . Mechanical and electrical properties, polymers , Biron, engineering alloy, ceramics, composites and magnetic materials, using and selection.

**22392 電腦輔助機械設計與實習 (1) 3,必**

本課程在讓學生運用 CAD 及 CAE 軟體進行簡易機構與機械元件之設計，並教授機構學及機械元件設計之基礎原理，透過分組實習讓學生在電腦的實作中更容易了解機構及機械之作動方式及如何分析機械系統之強度及動力特性。本課程為第一部份，著重在簡易機構之電腦輔助運動設計及分析，以及如何判讀分析結果。

**22392Elements of Mechanism and Practice (1) 3,R**

This course helps students learning about how to apply CAD and CAE softwares on mechanism and machinery design and the design skill of mechanisms and machine elements. Students can realize the motion of mechanisms, and strength and dynamic characteristics of the machinery system more easily through team-work and practice. This course is the first part and it focuses on design and analysis of the simple mechanisms using the CAD and CAE softwares, and interpretation of analysis results.

**22390 應用電子學與實習 3, 必**

內容詳實，深入淺出的理論說明且豐富詳盡的範例，適合於控制、冷凍空調與電子修護等相關領域的應用電路。每一章都有立即練習與學後評量以強化練習，瞭解同學的學習成效。內容詳實，深入淺出的理論說明且豐富詳盡的範例，提升學生學習意願。(1)先簡述上課要學習的東西和內容。(2)例題說明與分析、示範講解以及學生自我模擬練習。(3)課後進行簡單的測驗來知道學生的學習狀況。

教導學生正確的實驗教室器材使用方法與安全認知：(a)教導工業安全與衛生，(b)手工具的選擇及使用安全 2.瞭解實作與電子儀器的操作：(a)手工焊接的方法，(b)焊接練習，(c)綁線技術，(d)識別電子元件，電子元件的特性與規格，(e)三用電錶的認識及基本量測，三用電錶的使用探討，(f)電阻的量測與計算，(g)直流電源供應器的認識與使用，訊號產生器的認識與使用，(i)示波器的認識與使用，3.電學電路實習課程如：(a)克西荷夫電壓電流定理，並聯電路電壓與電流量測，(b)串聯電路電壓與電流量測，(c)簡易印刷電路板的製作，(d)電子電路的實作

**22390 Application Electronics and Practice 3,R**

Informative, Theoretical explanation in simple terms, and full and detailed examples, Suitable for control, refrigeration and air conditioning and electrical repair and other related fields of application circuits. Each chapter has practice immediately after the assessment and learning in order to strengthen practice, understand students' learning, content full and accurate, The informative, easy to understand and enrich the theoretical description of detailed examples to enhance students' willingness to learn. <1> will explain briefly the class of things to learn and content. <2> Example description and analysis, lectures and demonstrations and student self-simulation exercises. <3> After-school simple quiz to know that



student learning conditions.

1.Experimental classroom to teach students the proper use of equipment and safety awareness :  
 (a)Teach Industrial Safety and Health (b) The choice of tools and the use of safety 2. Learn implementation and operation of electronic equipment: (a) Hand soldering methods (b) Welding Practice  
 (c) Tie wire technology(d) Recognize of electronic components , Characteristics and specifications of electronic components (e) Multimeter awareness and basic measurement , Explore the use of Multimeter  
 (f) Resistance measurements and calculations (g) Understanding and using the DC power supply (h) Understanding and using the Signal generator (i) Understanding and using the oscilloscope 3. Electrical circuit Internship Program: (a) Kirchhoff's voltage current law , Parallel circuit voltage and current measurements (b) Series circuit voltage and current measurements (c) Simple printed circuit board production (d) Electronic circuit implementatio

### **21057 精密量測與實習 3, 必**

使學生了解不同類型的物件，可用何種量具或儀器(接觸式或非接觸式)，做量測或檢驗觀念，且熟悉各種量具及儀器的正確操作方法。

### **21057 Precision Measurement and Practice 3,R**

To enable students to understand the different types of objects that can be used, or what kind of measuring instrument (contact or contactless), doing the measurement or test ideas, and are familiar with a variety of measuring tools and instruments for proper operation.

### **22400 電腦數值控制工具機與實習 3,必**

介紹電腦數值控制工具機的基本構造，操作面盤的功能及使用，加工程式的傳輸，工作定位夾持，刀具選用及補正操作。經由實際加工，熟練電腦數控車床和銑床的操作，工件尺寸的測量，完成各類工件的精密加工。

### **22400 Computer Numerically Controlled Machine Tools and Practice 3,R**

The fundamental construct of a computer numerically controlled machine tool is introduced. The functions and operations of the control panel, the transfer of the manually or automatically created program, the positioning and fixture of a workpiece, the selection of tools and modified length or diameter of tools in machining process are practiced. By conducting the operations in CNC lathe and miller, and learning the measuring methods, most kinds of precision machined components can be achieved.

## **自動化工程 3 選**

以『控制』的觀念為主，培養自動化控制的能力，並能應用機器設計的能力，以構想出一套自動化設備之能力。課程內容包括自動化流程的設計，自動化元件與感測器使用知識，自動化裝配系統的設計，可程式控制器技術，此課程培訓學生具有實務性的設計能力，使學生瞭解可程式邏輯控制器的程式撰寫觀念與技巧，養成可程式邏輯控制器的實務應用能力。

### **Automatic Engineering 3 R**

Automatic Engineering is very important technique applied in industrious area. This course will introduce the design automation process, the useful knowledge of automatic devices and sensors, the automatic assemble system design and PLCC controller technique. The goal of this course will train students with the strong fundamental discipline automatic engineering and practical design ability.

### **程式設計與實習 3 必**

本課程將介紹應用 MATLAB 軟體於各種工程常見數學問題之理論與數值解析方法。課程中將介紹 MATLAB 軟體應用之基本指令，包括：數值運算、函數使用、陣列應用、邏輯控制、迴圈控制、函數庫、圖形繪製、視窗應用等主題。數值分析方法之應用，包括：數值微分、數值積分、非線性方程式、插值法、矩陣運算、聯立方程式及特徵值問題、常微分方程式、偏微分方程式、統計分析等。



**Program language and practice 3 R**

This course introduces the application of MATLAB software to theoretically and numerically solve various kinds of engineering mathematical problems. The course will introduce MATLAB Basic commands, including numerical operation, functions, array, logic control, loop control, subroutines, graphic control, and graphic-user-interface (GUI). Application of numerical analysis methods includes numerical difference, numerical integration, nonlinear equation, interpolation method, matrix operation, linear system equation, eigenvalue problem, ordinary differential equation (ODE), partial differential equation (PDE) and statistical analysis.

**22391 自動控制與實習 3,必**

本課程學習控制系統的分析與設計，認識系統方塊圖、訊號流程圖、系統元件之數學模型、控制器的設計與系統性能分析等；數學模型包括系統轉換函數和狀態空間模型。性能分析包括閉回路控制系統特性，瞬時反應分析，系統穩定性、反應指標法設計及根軌分析法等。本課程並包含兩小時應用 MATLAB 進行控制系統分析與設計的實習。

**22391 Automatic Control and Lab 3,R**

This course studies control system analysis and design. It introduce system block diagram, signal flow graph, mathematical models, controller design and system performance analysis. System performance analyses and designs using both transfer function and state space model. Other topics include feedback control system characteristics, transient-response analysis, system stability, performance index design and root-locus method. The course also includes 2 hours computer simulation of control system analysis and design using Matlab Tools.

**22402 可程式控制與實習 3,必**

本課程要旨為介紹近來工業界最常用之可程式控制器，其優點為精確、功能大、價格低、抗高溫及擴充性大。課程內容包括：控制器軟硬體介紹、撰寫程式、安裝及維修。本課程要旨為訓練學生能實際操作可程式控制器之能力。包括，程式撰寫，週邊設備架設，系統安裝與維修。

**22402 Programmable Logic Controller and internship 3,R**

The purpose of this course is to introduce the most-used programmable controller (PLC) in industries. The advantages of PLC are precision , easy-use , low-cost ,anti high-temp and easy-expand. The course includes as follow : Hardware and software of PLC, Programming of PLC, Maintaing and Installing of PLC. The aim of this course is to develop the students with the ability of operating programmable controller. The course's subjects include the PLC programming , the peripherals setup, and systems installation and maintaing.

**22756 進階電腦數值控制工具機 3,必**

介紹電腦數值控制工具機的基本構造，操作面盤的功能及使用，加工程式的傳輸，工作定位夾持，刀具選用及補正操作。經由實際加工，熟練電腦數控車床和銑床的操作，工件尺寸的測量，完成各類工件的精密加工。

**22756 Advanced computer numerical controlled machine tools 3,R**

The fundamental construct of a computer numerically controlled machine tool is introduced. The functions and operations of the control panel, the transfer of the manually or automatically created program, the positioning and fixture of a workpiece, the selection of tools and modified length or diameter of tools in machining process are practiced. By conducting the operations in CNC lathe and miller, and learning the measuring methods, most kinds of precision machined components can be achieved.

**22452 機電整合與實習 3,必**

本課程主要學習機電整合系統之相關元件及其基本架構。內容包括控制系統架構及微處理器控制系統介紹、機電特性簡介、運算放大器各種應用電路設計與信號調整、電力控制半導體、感測器、機電元件匹配與介面等。本課並安排電腦實習來輔助正課重點內容學習。

**22452 Mechatronics and lab 3,R**

This course studies the basic practice of electromechanical system components and structures. It introduces basic control system components and configuration, from feedback control system structure and microprocessor-based control system to components realization such as mechanical system design, power driver circuits design and sensor selection; topics include interface circuits between the mechanics and electronics, operational amplifier design and signal conditioning. computer simulation lab is provided to assist major topics study.

### **多軸複合加工 3,必**

介紹車銑複合加工機的基本構造，操作面盤的功能及使用，加工程式的設計，工作定位夾持，刀具選用及補正操作。經由實際加工，熟練車銑複合加工機的操作，工件尺寸的測量，完成各類工件的精密加工。

### **CNC Turning and Milling Complex Machines internships 3,R**

The fundamental construct of a CNC turning and milling complex Machines tool is introduced. The functions and operations of the control panel, the design of the manually or automatically created program, the positioning and fixture of a workpiece, the selection of tools and modified length or diameter of tools in machining process are practiced. By conducting the operations in CNC turning and milling complex Machines, and learning the measuring methods, most kinds of precision machined components can be achieved.

### **21290 工廠管理 3,必**

培養健全之機械相關產業之技術人才，能擔任機械之元件製造、裝配、操作、保養及簡易維護等實用知識與技能，使用機具設備、機械製圖、識圖之能力，培養學生具備敬業、負責、勤奮、合作等職業道德及良好安全衛生工作習慣，使用量測設備之能力、機械工作之能力、培育具有在相關專業領域繼續進修、專題製作與研究發展的能力。

### **21290 Factory Management 3,R**

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.

傳閱附件 5----機械工程系「110 學年度產學訓攜手專班」課程大綱

**機械工程系(產學訓專班)(110 學年度入學適用)****Department of Mechanical Engineering****一、必修科目 Required Courses****機械設計 3,必**

本課程主要介紹機械設計的程序與方法，內容包括機械設計程序、機械結構設計與分析、機械振動、傳動元件、機構設計與分析、概念設計的創意與表達、最佳化設計、細部設計的考量等。

**Machine Design 3, R**

Procedure and methods of machine design are the major concern of this lesson. The topics include procedure of machine design, design and analysis of machine structure, vibration, elements of transmission, design and analysis of mechanism, creativity and presentation of ideal design, optimum design, and detail design

**書報討論 2,必**

本課程介紹蒐集及閱讀文獻方法與技巧；文獻格式之書寫以及文獻回顧撰寫；擬定研究規劃方法；實務專題研究計畫書格式及撰寫；實務專題報告格式及撰寫；口頭報告準備與技巧。針對配合技術報告撰寫之工具軟體（WORD、POWERPOINT、EXCEL、Acrobat Reader、Grapher 等）使用技巧簡介。其他相關寫作之主題：求職信、履歷表、自傳；推薦甄試讀書計畫、推薦信；面談技巧；會議通知、議程、紀錄，公文格式；備忘錄、信件、傳真格式等。

**Reading Seminar 2, R**

This course introduces how to do literature search and reading, including the topics about reference list format and literature review writing. Research planning is also presented, especially for senior research projects. Both the proposal and final report format will be introduced as well as oral presentation techniques. For the preparation of a technical report, the techniques in using several tool softwares, such as WORD, PowerPoint, EXCEL, Acrobat Reader, Grapher and etc., are taught. Other related writing subtopics, such as cover letter, resume, autobiography, study plan, recommendation letter, interview technique, meeting announcement, meeting agenda, meeting summary, formal document, memorandum, letter and etc., will also be discussed.

**工業配線 3,必**

針對非電工或電子基礎學生為授課對象，由基本電器元件認識、簡單自動控制原理開始，認識電路圖、基本配線操作，懂得居家及工作廠房配線檢修，希冀達到符合技能檢定水準能力。

**Industrial Wiring 3, R**

For the backbround of non-electrical or electronic students, the course starts with the understanding of basic electrical components and simple automatic control principles. It can help student understand of circuit diagrams, basic wiring operations, and knowledge of home and plants wiring maintenance. Moreover, we hope students reach to the skill verification level.

**自動化加工與實習 3,必**

數控工具機(CNC)為現今機械工業的主力，工業機械手臂作為工件物流與機台串聯的角色，是智慧製造的最佳助手。本課程主旨為介紹使用工業型機械手臂於電腦整合系統(CIM)中，課程內容含電腦數值控制車銑床之操作與控制，電腦輔助製造軟體應用、工業機器人介紹、工業機器人結構

與末端工具、感測器、控制器、控制程式介紹等，最後並介紹工業型機械手臂於電腦整合系統中之應用與實作。

### **Automated Processing and Practice 3, R**

Computer Numerical Control (CNC) machine is the main force of today's machinery industry, as the role of workpiece logistics and machine series in series, the industrial robot arm is the best assistant for smart manufacturing. The purpose of this course is to introduce the industrial robot in Computer-Integrated Manufacturing (CIM) system, the topics cover programming practice and operation for computer numerical controlled machine, robotic end-effector, sensors, actuators, signals processing, programmable logic controller, etc., to control the mechanism to reach the function.

### **322016 基礎電學 2,必**

本課程在培養學生具備電學之基本概念、熟悉電學之計算方法及應用電學之相關技能。教導學生認識被動元件之基本特性、了解交直流相關電路之基本原理，使學生具有良好的電學知能基礎。

### **322016 Fundamental Electricity 2, R**

In this course, students will learn to have the basic concepts of electricity, be familiar with the calculation methods of electricity and the related skills of applied electricity. Teach students to understand the basic characteristics of passive components, understand the basic principles of AC and DC related circuits, so that students have a good foundation of electrical knowledge.

### **322012 自動控制技術 3, 必**

本課程學習閉回路控制系統的觀念及其數學模式建立技巧。控制系統之轉換函數和狀態空間模型之分析與設計。包括閉回路控制系統特性，瞬時反應分析，根軌分析法，及頻率響應分析法等。

### **322012 Automatic Control 3, R**

This course studies the concepts and mathematical modeling techniques of feedback control systems. Analyses and designs the control system models of both transfer function and state space model. Topics include feedback control system characteristic, transient-response analysis, root-locus method, and frequency responses method.

### **322017 流體力學 3, 必**

流體力學主要探討流體靜止或流動之行為。流體的特性、流體壓力的變化、流體運動學以及流體現象（包括管流、外環流體、壓縮與不可壓縮等流體）之數學表示式，將有系統的介紹與探討。

### **322017 Fluid Mechanics 3, R**

This course provides fundamental aspects of fluid mechanics such as fluid properties, pressure variations in fluids at rest and in motion, fluid kinematics, mathematical description of fluid phenomena like internal, external, incompressible, and compressible flows.

### **22746~22753 產業實務實習 (一)~(六) 5, 必**

落實學生學以致用，並加強縮短四技學程的學生學用落差，而進行培育相關實務工作經驗之一系列實習課程。

### **22746~22753 Professional practice (1)~(6) 5, R**

Through this course, students can apply their knowledge to implement and cultivate a series of



relevant practical work experience in this internship programs.

### **05022 基礎物理 3, 必**

一、力學：

1.等加速運動 2.牛頓運動定律 3.靜平衡 4.功與能 5.線動量 6.轉動運動 7.轉動功與能。

二、熱力學：

1.第零定律 2.熱與功 3.第一定律 4.第二定律。

### **05022 Fundamental Physics 3, R**

1.Mechanics：

(1).Uniform Accelerated Motion (2).Newton's Laws of Motion

(3).Static Equilibrium (4).Work and Energy

(5).Linear Momentum (6). Rotational movement

(7).Rotational Work Energy and Momentum

2.Thermodynamics：

(1).The Zeroth Law of Thermodynamics

(2). Heat and work

(3).The First Law of Thermodynamics

(4).The Second Law of Thermodynamics

### **40006 工程圖學 3, 必**

本課程使學生瞭解 CNS 工程製圖之標準與方法，培養學生識圖的能力，並能應用投影與展開原理，正確、清晰、美觀、迅速繪製各種機械工作零件與組合圖，並使學生熟悉各種平面與立體繪圖的觀念與技術技能，養成圖學表現與溝通的實務應用能力。

### **40006 Engineering Graphics 3,R**

This course enables students to understand the CNS standard and methods of engineering drawing, and cultivate students to have the abilities of knowing graphics and to apply the principles of projection and expanding for drawing various mechanical parts and assemble graphics. Moreover, this course familiarize students with a variety of two- and three-dimensional graphics concepts and drawing skills, and equip students with the ability to develop practical applications and drawing communications.

### **322005 應用力學 3, 必**

本課程之目的主要是介紹基本的力學觀念及原則，包括了質點靜力學、剛體的等效力系、剛體平衡、均佈力，以及結構的分析。

### **322005 Statics 3, R**

The coverage of this course includes fundamental concepts and principles of mechanics; statics of particles; equivalent systems of forces for rigid bodies; equilibrium of rigid bodies; distributed forces; and analysis of structures.

### **22291 電腦輔助機械製圖 3, 必**

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。

### **22291 Computer-aided Mechanical Drawing 3, R**

This course let students familiarizes with the correct drawing methods of mechanical engineering drawings and the use of computer-aided mechanical drawing. Students are trained to acquaint the mechanical drawing and to use the projection method to complete mechanical drawing by AutoCAD and SolidWorks software. This course trains students to understand the concept and technique of CAD and to possess the skill of practical application on CAD.

### **20048 進階工廠實習 3, 必**

本課程內容包含工廠規則及安全規定說明，加工零組件之組合成成品，及兩大類別之實習項目：(1)鋸削及砂輪機，車床，鑽床及銑床，磨床和數控工具機之操作。(2)砂模鑄造，精密鑄造，銲接，熱處理，板金加工和鉗工。

### **20048 Advanced Plant Practice 3, R**

The content of this course include the description of the usage rules and safety requirements, to assembly the fabricated components to be a product, and two group items: (1) The operations of band machining and hard polishing, engine lathe, drilling and milling machines grinders, and numerical control machine tools. (2) Sand casting, precision casting, welding, heat treatment, sheet forming, and benchwork.

### **40306 材料力學 3, 必**

本課程介紹的主題有受軸向力、扭力及彎矩等作用之構件的分析及設計，並包含應力、應變、彈性及非彈性行為和應變能的基本觀念。其它一般性主題包含應力與應變的轉換，應力集中，樑之撓度，柱之行為和能量法。特殊主題則有熱效應，預應變效應，壓力容器，非等載面構件，不連續函數，剪力中心和非彈性彎曲。

### **40306 Mechanics of Materials 3, R**

The topics introduced in this course include the analysis and design of structural member subjected to axial load, torsion and bending, as well as such fundamental concepts as stress, strain, elastic, and inelastic behavior, and strain energy. Other topics of general interest are the transformation of stress and strain, stress concentrations, deflections of beam, behavior of columns, and energy methods. More specialized topics are thermal and prestrain effects, pressure vessels, nonprismatic members, discontinuity functions, shear center. and inelastic bending.

### **21570 機械製造 3, 必**

本課程介紹機械元件之製造原理與方法，著重系統化之說明。製造對象包含金屬、高分子、陶瓷及半導體等材料，製造方法包含鑄造、塑性成形、切削、銲接、熱處理、表面處理、粉末冶金及非傳統加工等。探討重點在於結合材料之特性及設計之理念，輔以工具機、工模夾治刀具及量測與檢驗的知識，配合生產管理及電腦輔助製造系統之學理與實務，建立一完整性之製造系統觀念。

### **21570 Manufacturing Processes and Systems 3, R**

This course introduces the manufacturing principles and methods of the mechanical components, emphasizing on the systematic descriptions. The discussed materials include metals, polymers, ceramics and semiconductors. The manufacturing methods include casting, plastic deformation, machining, welding, heat treatment, surface treatment, powder metallurgy and nontraditional processes. The investigation of material properties and design concepts are discussed. In addition, the knowledge of machine tools, jigs, fixtures and tools, and metrology and inspections are discussed. The comprehensive manufacturing concept is built by combining the principles and techniques of the production management and computer-aided manufacturing systems.

### **20036 工程材料 3, 必**

概論、原子結構與鍵結、晶體結構與缺陷、相平衡、材料物化性、材料強化、金屬材料、陶瓷材料、聚合材料、複合材料、磁料、電性、材料使用與選擇。

### **20036 Materials Science and Engineering 3, R**

Introduction , atomic structure and bonding. Crystal structures and imperfections, phase equilibrium, Mechanical and electrical properties, polymers, engineering alloy, ceramics, composites and magnetic materials, using and selection.

### **21057 精密量測與實習 3, 必**

使學生了解不同類型的物件，可用何種量具或儀器(接觸式或非接觸式)，做量測或檢驗觀念，且熟悉各種量具及儀器的正確操作方法。

### **21057 Precision Measurement and Practice 3, R**

To enable students to understand the different types of objects that can be used, or what kind of measuring instrument (contact or contactless), doing the measurement or test ideas, and are familiar with a variety of measuring tools and instruments for proper operation.

### **22400 電腦數值控制工具機與實習 3, 必**

介紹電腦數值控制工具機的基本構造，操作面盤的功能及使用，加工程式的傳輸，工作定位夾持，刀具選用及補正操作。經由實際加工，熟練電腦數控車床和銑床的操作，工件尺寸的測量，完成各類工件的精密加工。

### **22400 Computer Numerically Controlled Machine Tools and Practice 3, R**

The fundamental construct of a computer numerically controlled machine tool is introduced. The functions and operations of the control panel, the transfer of the manually or automatically created program, the positioning and fixture of a workpiece, the selection of tools and modified length or diameter of tools in machining process are practiced. By conducting the operations in CNC lathe and miller, and learning the measuring methods, most kinds of precision machined components can be achieved.

### **22402 可程式控制與實習 3, 必**

本課程要旨為介紹近來工業界最常用之可程式控制器，其優點為精確、功能大、價格低、抗高溫及擴充性大。課程內容包括：控制器軟硬體介紹、撰寫程式、安裝及維修。本課程要旨為訓練學生能

實際操作可程式控制器之能力。包括，程式撰寫，週邊設備架設，系統安裝與維修。

### **22402 Programmable Logic Controller and internship 3, R**

The purpose of this course is to introduce the most-used programmable controller (PLC) in industries. The advantages of PLC are precision, easy-use, low-cost, anti high-temp and easy-expand. The course includes as follow : Hardware and software of PLC, Programming of PLC, Maintaing and Installing of PLC. The aim of this course is to develop the students with the ability of operating programmable controller. The course's subjects include the PLC programming, the peripherals setup, and systems installation and maintain.

### **22452 機電整合與實習 3, 必**

本課程主要學習機電整合系統之相關元件及其基本架構。內容包括控制系統架構及微處理器控制系統介紹、機電特性簡介、運算放大器各種應用電路設計與信號調整、電力控制半導體、感測器、機電元件匹配與介面等。本課並安排電腦實習來輔助正課重點內容學習。

### **22452 Mechatronics and lab 3, R**

This course studies the basic practice of electromechanical system components and structures. It introduces basic control system components and configuration, from feedback control system structure and microprocessor-based control system to components realization such as mechanical system design, power driver circuits design and sensor selection; topics include interface circuits between the mechanics and electronics, operational amplifier design and signal conditioning. Computer simulation lab is provided to assist major topics study.

### **21290 工廠管理 3, 必**

培養健全之機械相關產業之技術人才，能擔任機械之元件製造、裝配、操作、保養及簡易復護等實用知識與技能，使用機具設備、機械製圖、識圖之能力，培養學生具備敬業、負責、勤奮、合作等職業道德及良好安全衛生工作習慣，使用量測設備之能力、機械工作之能力、培育具有在相關專業資域繼續進修、專題製作與研究發展的能力。

### **21290 Factory Management 3,R**

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.



**機械工程系 (四技進修部) (110-113 學年度入學適用)****Department of Mechanical Engineering****一、必修科目 Required Courses****22222 基礎數學 3, 必 周春禧、上**

本基礎數學課程是針對幾個學習微積分所需理解的重要概念而設計。這門課程可提供學生代數與三角函數紮實的基礎。主要的內容包含了線性、多項式、片斷、指數、對數與三角函數的觀念介紹。此外，簡單的矩陣運算亦會在課程中介紹。學生將會學習如何以符號、圖型和數值方法來操作這些函數。

**22222 Fundamental mathematic 3, R Chou,Chuen-Shii , F**

This fundamental math course focuses on various topics that are important to the study of calculus. Through this course students will acquire a solid foundation in algebra and trigonometry. The topic is placed on understanding the concepts of linear, polynomial, piecewise, exponential, logarithmic, and trigonometric function. In addition, simple matrix operation will be covered in this course. Students will learn to work these functions in symbolic, graphical, and numerical form.

**20048 工廠實習 1, 必 黃惟泰、上**

本課程內容包含工廠規則及安全規定說明，加工零組件之組合成成品，及兩大類別之實習項目：(1)鋸削及砂輪機，車床，鑽床及銑床，磨床和數控工具機之操作。(2)砂模鑄造，精密鑄造，銲接，熱處理，板金加工和鉗工。

**20048 Machine Shop Practice 1, R Wei-Tai Huang , F**

The content of this course include the description of the usage rules and safety requirements, to assembly the fabricated components to be a product, and two group items: (1) The operations of band machining and hard polishing, engine lathe, drilling and milling machines grinders, and numerical control machine tools. (2) Sand casting, precision casting, welding, heat treatment, sheet forming, and bench work.

**22397 工程圖學與實習 2, 必 待聘、上**

本課程使學生瞭解 CNS 工程製圖之標準與方法，培養學生識圖的能力，並能應用投影與展開原理，正確、清晰、美觀、迅速繪製各種機械工作零件與組合圖，並使學生熟悉各種平面與立體繪圖的觀念與技術技能，養成圖學表現與溝通的實務應用能力。

**22397 Engineering Graphics and Practice 2, R , F**

This course enables students to understand the CNS standard and methods of engineering drawing, and cultivate students to have the abilities of knowing graphics and to apply the principles of projection and expanding for drawing various mechanical parts and assemble graphics. Moreover, this course let students familiarize with a variety of two- and three-dimensional graphics concepts and drawing skills, and equip students with the ability to develop practical applications and drawing communications.

**23068 應用力學 3, 必 待聘、下**

本課程之目的主要是介紹基本的力學觀念及原則，包括了質點靜力學、剛體的等效力系、剛體平衡、均佈力，以及結構的分析。

**23068 Statics 3, R , S**

The coverage of this course includes fundamental concepts and principles of mechanics; statics of particles; equivalent systems of forces for rigid bodies; equilibrium of rigid bodies; distributed forces; and analysis of structures.

**23043 程式設計與實習 3, 必 陳永祥、下**

本課程將介紹應用 MATLAB 軟體於各種工程常見數學問題之理論與數值解析方法。課程中將介紹 MATLAB 軟體應用之基本指令，包括：數值運算、函數使用、陣列應用、邏輯控制、迴圈控

制、函數庫、圖形繪製、視窗應用等主題。數值分析方法之應用，包括：數值微分、數值積分、非線性方程式、插值法、矩陣運算、聯立方程式及特徵值問題、常微分方程式、偏微分方程式、統計分析等。

**23043 Program language and practice 3, R Chen, Yung-Hsiang, S**

This course introduces the application of MATLAB software to theoretically and numerically solve various kinds of engineering mathematical problems. The course will introduce MATLAB Basic commands, including numerical operation, functions, array, logic control, loop control, subroutines, graphic control, and graphic-user-interface (GUI). Application of numerical analysis methods includes numerical difference, numerical integration, nonlinear equation, interpolation method, matrix operation, linear system equation, eigenvalue problem, ordinary differential equation (ODE), partial differential equation (PDE) and statistical analysis.

**21544 電腦輔助機械製圖 3, 必 待聘、下**

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。

**21455 Computer-aided Mechanical Drawing 3, R ,F**

This course equips students with regular operations on the mechanical engineering drawing and the use of computer-aided mechanical drawing. Students are trained to acquaint the mechanical drawing and to use the projection method to complete mechanical drawing by AutoCAD and SolidWorks software. This course trains students to understand the concept and technique of CAD and to possess the skill of practical application on CAD.

**20040 工程數學(1) 2, 必 陳金山、上**

本課程介紹一階微分方程式，二階微分方程式，拉普拉斯轉換與級數解等常微分方程式的課題。向量與特徵值、等微向量也將在本課程教授。線性代數的課題：比如說向量，矩陣，線性方程組，行列式與等徵值，特徵向量也將在本課程教授。

**20040 Engineering Mathematics(1) 2, R Chen, Chin-Shan, F**

Linear ordinary differential equations, and series solutions are discussed in this course. The fields of vectors and linear algebra are also touched. Students should know about vectors, matrices, linear systems of equations, determinants, eigenvalues and eigenvectors after finishing this course.

**40306 材料力學 3, 必 陳金山、上**

本課程介紹的主題有受軸向力、扭力及彎矩等作用之構件的分析及設計，並包含應力、應變、彈性及非彈性行為和應變能的基本觀念。其它一般性主題包含應力與應變的轉換，應力集中，樑之撓度，柱之行為和能量法。特殊主題則有熱效應，預應變效應，壓力容器，非等截面構件，不連續函數，剪力中心和非彈性彎曲。

**40306 Mechanics of Materials 3, R Chen, Chin-Shan, F**

The topics introduced in this course include the analysis and design of structural member subjected to axial load, torsion and bending, as well as such fundamental concepts as stress, strain, elastic, and inelastic behavior, and strain energy. Other topics of general interest are the transformation of stress and strain, stress concentrations, deflections of beam, behavior of columns, and energy methods. More specialized topics are thermal and prestrain effects, pressure vessels, nonprismatic members, discontinuity functions, shear center. and inelastic bending.

**20036 工程材料 3, 必 趙志燁, 上**

概論、原子結構與鍵結、晶體結構與缺陷、相平衡、材料物化性、材料強化、金屬材料、陶瓷材料、聚合材料、複合材料、磁料、電性、材料使用與選擇。

**20036 Materials Science and Engineering 3 R Chau, Chih-Yeh, F**

Introduction, atomic structure and bonding. Crystal structures and imperfections, phase diagram. Mechanical and electrical properties, polymers, engineering alloy, ceramics, composites and magnetic

materials, using and selection.

### 21350 材料實驗

1, 必

李英杰、上

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。本課程探討傳統及近代陶瓷的原料特性、基本物理性質檢測、及各種不同成形法。基本物性測試包括；粒度測試、密度測試、及黏度測試。成形法的課程內容有；泥陶瓷粉末之分散實驗、陶瓷粉末注漿成形法、理論密度量測與計算、陶瓷薄帶的製造等。本課程除傳授相關的知識背景外，並特別強調學生的實作與參與使學生認識陶瓷製造的基本過程，包括傳統陶瓷，結構陶瓷，及玻璃等製程。另外，藉由 SEM 與 XRD 的分析，也使學生了解陶瓷材料在燒結後顯微結構的變化。

### 21350 Fundamental Experiments in Materials 1, R

Ying-Chieh, Lee, F

This course is designed to introduce the ceramic, basic reaction principles and fundamental approach of analysis of the inorganic substance occurred. The content includes the dielectric properties and compositions of ceramics. The experiment is designed to introduce students to the knowledge and implementation of characteristics of ceramics by microstructural analysis, particle dispersion, packing density, theory density calculation and sintering kinetic.

### 20653 動力學

3, 必

待聘、上

本課程為銜接靜力學の後續課程,其課程內容分為質點運動,質點動力學,質點系統,剛體運動學,剛體動力學,剛體在三維中之動力學,及機械振動,使學生能利用一些已熟知的基本原理去解答與分析動力學的問題。

### 20653 Dynamics

3, R

, S

Dynamics is the extension course of statics, that helps students to solve and analysis the problems of dynamics by using the principles they were already familiar in the statics Course is offered to cover: Kinematics of particle Kinetics of particle, System of particle, Kinematics of rigid-body Kinetics of rigid-body, Mechanical vibration.

### 21570 機械製造

3, 必

簡文通、下

本課程介紹機械元件之製造原理與方法，著重系統化之說明。製造對象包含金屬、高分子、陶瓷及半導體等材料，製造方法包含鑄造、塑性成形、切削、銲接、熱處理、表面處理、粉末冶金及非傳統加工等。探討重點在於結合材料之特性及設計之理念，輔以工具機、工模夾治刀具及量測與檢驗的知識，配合生產管理及電腦輔助製造系統之學理與實務，建立一完整性之製造系統觀念。

### 21570 Manufacturing Processes and Systems 3, R

Wen-Tung Chien, S

This course introduces the manufacturing principles and methods of the mechanical components, emphasizing on the systematic descriptions. The discussed materials include metals, polymers, ceramics and semiconductors. The manufacturing methods include casting, plastic deformation, machining, welding, heat treatment, surface treatment, powder metallurgy and nontraditional processes. The investigation of material properties and design concepts are discussed. In addition, the knowledge of machine tools, jigs, fixtures and tools, and metrology and inspections are discussed. The comprehensive manufacturing concept is built by combining the principles and techniques of the production management and computer-aided manufacturing systems.

### 自動控制技術

3, 必

陳金山, 下

本課程學習控制系統的分析與設計，認識系統方塊圖、訊號流程圖、系統元件之數學模型、控制器的設計與系統性能分析等；數學模型包括系統轉換函數和狀態空間模型。性能分析包括閉回路控制系統特性，瞬時反應分析，系統穩定性、反應指標法設計及根軌分析法等。本課程並包含兩小時應用 MATLAB 進行控制系統分析與設計的實習。

### Automatic Control 3, R

Chen, Chin-Shan, S

This course studies control system analysis and design. It introduce system block diagram, signal flow graph, mathematical models, controller design and system performance analysis. System performance analyses and designs using both transfer function and state space model. Other topics



include feedback control system characteristics, transient-response analysis, system stability, performance index design and root-locus method. The course also includes 2 hours computer simulation of control system analysis and design using Matlab Tools.

**21057 精密量測與實習****2, 必****黃惟泰, 下**

使學生了解不同類型的物件，可用何種量具或儀器(接觸式或非接觸式)，做量測或檢驗觀念，且熟悉各種量具及儀器的正確操作方法。

**21057 Precision measurement internship****2, R****Wei-Tai Huang, S**

To enable students to understand the different types of objects that can be used, or what kind of measuring instrument (contact or contactless), doing the measurement or test ideas, and are familiar with a variety of measuring tools and instruments for proper operation.

**22394 熱學工程概論****3, 必****姜庭隆、下**

本課程要旨為介紹介紹熱力學與熱傳學中的基本概念、各種現象及實際工程上的應用，並以有限元素軟體輔助教學實習。內容包含：基本概念，特性與狀態，熱力學第一定律，熱力學第二定律、熱機原理(封閉循環: Carnot Cycle, Otto Cycle, Diesel Cycle, 內燃機/四衝程引擎, 外燃機, 冷凍原理)。

**22394 Introduction of Thermal Engineering****3, R****Chiang, Ting-Lung, S**

The purpose of this course is to give undergraduate students a solid knowledge about the basic principles of thermal engineering, which involves knowledge of thermodynamics and heat transfer. The contents of this includes: fundamental concepts, first and second laws of thermodynamics, thermodynamic cycles and heat transfer principles.

**22390 應用電子學與實習****3, 必****陳念慈, 下**

內容詳實，深入淺出的理論說明且豐富詳盡的範例，適合於控制、冷凍空調與電子修護等相關領域的應用電路。每一章都有立即練習與學後評量以強化練習，瞭解同學的學習成效。內容詳實，深入淺出的理論說明且豐富詳盡的範例，提升學生學習意願。〈1〉先簡述上課要學習的東西和內容。〈2〉例題說明與分析、示範講解以及學生自我模擬練習。〈3〉課後進行簡單的測驗來知道學生的學習狀況。

教導學生正確的實驗教室器材使用方法與安全認知：(a)教導工業安全與衛生，(b)手工工具的選擇及使用安全。2.瞭解實作與電子儀器的操作：(a)手工焊接的方法，(b)焊接練習，(c)綁線技術，(d)識別電子元件，電子元件的特性與規格，(e)三用電錶的認識及基本量測，三用電錶的使用探討，(f)電阻的量測與計算，(g)直流電源供應器的認識與使用，訊號產生器的認識與使用，(i)示波器的認識與使用。3.電學電路實習課程如：(a)克西荷夫電壓電流定理，並聯電路電壓與電流量測，(b)串聯電路電壓與電流量測，(c)簡易印刷電路板的製作，(d)電子電路的實作

**22390 Application Electronics and Practice****3, R****Nyen-Ts Chen, S**

Informative, Theoretical explanation in simple terms, and full and detailed examples, Suitable for control, refrigeration and air conditioning and electrical repair and other related fields of application circuits. Each chapter has practice immediately after the assessment and learning in order to strengthen practice, understand students' learning, content full and accurate, The informative, easy to understand and enrich the theoretical description of detailed examples to enhance students' willingness to learn. <1> will explain briefly the class of things to learn and content. <2> Example description and analysis, lectures and demonstrations and student self-simulation exercises. <3> After-school simple quiz to know that student learning conditions.

1.Experimental classroom to teach students the proper use of equipment and safety awareness：(a)Teach Industrial Safety and Health (b) The choice of tools and the use of safety. 2. Learn implementation and operation of electronic equipment: (a) Hand soldering methods (b) Welding Practice (c) Tie wire technology(d) Recognize of electronic components, Characteristics and specifications of electronic components (e) Multimeter awareness and basic measurement，Explore the use of Multimeter (f) Resistance measurements and calculations (g) Understanding and using the DC power supply (h) Understanding and using the Signal generator (i) Understanding and using the oscilloscope. 3. Electrical



circuit Internship Program: (a) Kirchhoff's voltage current law, Parallel circuit voltage and current measurements (b) Series circuit voltage and current measurements (c) Simple printed circuit board production (d) Electronic circuit implementation.

**21132 機械設計****3, 必****待聘, 上**

本課程在讓學生運用 CAD 及 CAE 軟體進行簡易機構與機械元件之設計，並教授機構學及機械元件設計之基礎原理，透過分組實習讓學生在電腦的實作中更容易了解機構及機械之作動方式及如何分析機械系統之強度及動力特性。本課程為第二部份，著重在機械系統之電腦輔助設計，進行元件選用、尺寸設計、強度及壽命分析，以及如何判讀分析結果。

**21132 Mechanical Design****3, R****, F**

This course helps students learning about how to apply CAD and CAE softwares on mechanism and machinery design and the design skill of mechanisms and machine elements. Students can realize the motion of mechanisms, and strength and dynamic characteristics of the machinery system more easily through team-work and practice. This course is the second part and it focuses on the machine element selection, dimension determination, strength and life analysis of the machinery systems through the CAD and CAE softwares, and interpretation of the analysis results.

**22395 電腦輔助流體力學與實習****3, 必****姜庭隆, 下**

流體力學主要探討流體靜止或流動之行為。流體的特性、流體壓力的變化、流體運動學以及流體現象（包括管流、外環流體、壓縮與不可壓縮等流體）之數學表示式，將有系統的介紹與探討。本課程同時教授學生利用電腦以及計算(數值)方法，配合商用有限元素軟體 Gambit-ANSYS/Fluent 將流體力學中的實際工程問題，在電腦中進行視覺性的探討與整合，分析流體方程式，以得到所需要之資訊，如：壓力、流速、阻力，以及各種流體力學之現象:如邊界層的分離。

**22395 Computer Aided Fluid Mechanics and Workshop****3 R****Chiang,Ting-Lung, S**

This course provides fundamental aspects of fluid mechanics such as fluid properties, pressure variations in fluids at rest and in motion, fluid kinematics, mathematical description of fluid phenomena like internal, external, incompressible, and compressible flows. Also included in this course is an introduction of commercial software as ANSYS/FLUENT, which can help students learning how to use the computer/numerical methods to solve real world fluid dynamics problems, so that fluid properties as: pressure distribution, velocity field, and boundary layer separation can be visualized.

**21290 工廠管理****3, 必****黃惟泰, 上**

培養健全之機械相關產業之技術人才，能擔任機械之元件製造、裝配、操作、保養及簡易修護等實用知識與技能，使用機具設備、機械製圖、識圖之能力，培養學生具備敬業、負責、勤奮、合作等職業道德及良好安全衛生工作習慣，使用量測設備之能力、機械工作之能力、培育具有在相關專業資域繼續進修、專題製作與研究發展的能力。

**21290 Factory Management****3, R****Wei-Tai Huang, F**

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.

**二、選修科目 Elective Courses****22398 進階工廠實習****1, 選****黃惟泰, 下**

本課程之目的在增進與延續學生修習基礎工廠實習之技能。藉由此課程訓練使學生能對於精密切削加工精度控制與工具機操作能更熟練，並加入精密磨削的單元使學生在相關技能上能更精進。

**22398 Advanced Practical Training in Factory 1, S****Huang,Wei-Tai , S**

The purpose of this course is to let students continue to attend the promotion and practice the based skills of factory. With this training course to enable students to be more proficient precision control for precision machining and machine operation, and add precision grinding unit on the relevant skills to enable students and to be more diligent.

**322025 文獻選讀與寫作****2, 選****待聘, 上**

蒐集、閱讀文獻方法；文獻回顧撰寫；擬定研究規劃方法；實務專題研究計畫書格式及撰寫；實務專題報告格式及撰寫；口頭報告準備與技巧；工具軟體（WORD、POWERPOINT、EXCEL、Acrobat Reader、Grapher 等）使用技巧；其他主題：求職信、履歷表、自傳；推薦甄試讀書計畫、推薦信；面談技巧；會議通知、議程、紀錄，公文格式；備忘錄、信件、傳真格式。

**322025 Literature reading and writing****2, S****Hsiung,Chin-Min , F**

This course introduces how to do literature search and reading, including the topics about reference list format and literature review writing. Research planning is also presented, especially for senior research projects. Both the proposal and final report format will be introduced as well as oral presentation techniques. For the preparation of a technical report, the techniques in using several tool softwares, such as WORD, PowerPoint, EXCEL, Acrobat Reader, Grapher and etc., are taught. Other related writing subtopics, such as cover letter, resume, autobiography, study plan, recommendation letter, interview technique, meeting announcement, meeting agenda, meeting summary, formal document, memorandum, letter and etc., will also be discussed.

**22400 電腦數值控制工具機與實習****3, 選****待聘, 上**

介紹電腦數值控制工具機的基本構造，操作面盤的功能及使用，加工程式的傳輸，工作定位夾持，刀具選用及補正操作。經由實際加工，熟練電腦數控車床和銑床的操作，工件尺寸的測量，完成各類工件的精密加工。

**22400 Computer numerical control machine tool and practice 3, S****Chen,Teng-Hui, F**

The fundamental construct of a computer numerically controlled machine tool is introduced. The functions and operations of the control panel, the transfer of the manually or automatically created program, the positioning and fixture of a workpiece, the selection of tools and modified length or diameter of tools in machining process are practiced. By conducting the operations in CNC lathe and miller, and learning the measuring methods, most kinds of precision machined components can be achieved.

**21131 機械振動****3, 選****王栢村, 下**

本課程要旨為介紹振動力學的基本理論並且著重於工程上之實際應用。課程內容主要包括自由振動及強調振動，單自由度及多自由度系統振動，運動方程式推導及數值分析方法。

**21131 Mechanical Vibration****3, S****Wang, Bor-Tusen, S**

The purpose of this course is to present comprehensive coverage of the fundamental principles of vibration theory, with emphasis on the application of these principles to practical engineering problems. The content of this study is as followings: free and forced vibration, single and multiple degree-of-freedom systems, derivation of equations of motion and numerical analysis methods.

**22878 機器人學****3, 選****陳永祥, 下**

這門課程向學生介紹了機器人的基礎知識。協助學生了解建構機器人的相關原理與元素。修完課程後，學生將具備以下的知識：了解機器人的組成與應用。

**22878 Robotics****3, S****Chen,Yung-Hsiang ,S**

This course introduces students to the basic knowledge of robotics. It helps students understand about how robotics will be constructed under a variety of theorems and elements. Upon completion of this course, students should gain the knowledge of robotics components and application.

**圖控程式設計與實習****3, 選****陳念慈, 上**

培養學生在圖控程式 LabVIEW 相關知識、撰寫技巧，運用基本的學習方式，一步一步地操作，以主題式的方式來呈現 LabVIEW 的基本特徵，以及程式撰寫方式，藉以進行 Arduino 系統整合應用。

### **Graphical controlling software for design and application 3 S Nyen-Ts Chen, F**

The purpose of the course is to train students in the LabVIEW related knowledge, writing skills. Use of basic learning methods, step by step operation, The theme of the way to present the basic characteristics of LabVIEW, as well as the way the program is written, to Arduino system integration applications.

#### **多軸複合加工技術與實習**

**3, 選**

**待聘, 上**

本課程主要教授車銑複合加工與五軸加工的原理、實習操作、加工程式之撰寫及結合 CAD/CAM 達成加工編程，使學生能整合車削、銑削及五軸加工等多軸複合加工的功能及其操作。本科目分成兩部分，為多軸複合加工技術與實習(1)(2)。多軸複合加工技術與實習(1)之內容著重於工件端面的加工，運用 C 軸在軸向端面上鑽孔、鉸孔、攻牙與輪廓銑削，五軸加工機控制器的操作、手動及自動校正刀具長度。多軸複合加工技術與實習(2)之內容則在較為複雜的徑向鑽孔、鉸孔、攻牙與輪廓銑削軸，並且進行曲面銑削；此外必須了解五軸定位加工和聯動加工的差異。課程初期以手寫程式而熟捻刀具路徑語法，進而應用 CAM 來達成加工程式編寫，最後將工件加工完成於以驗證。

### **Multi-axis CNC machining technology and practicing (1) 3R Chen,Teng-Hui, F**

This course mainly provides the principle of turn-mill machining, 5-axis machining, CNC practicing, CNC programming by manual and CAM software. The students can integrate the function of turning and milling technology and 5-axis machining technology. The content can focus on the machining of the end face of a workpiece. The application of C axis is used to drill holes, reaming, tapping, and contour milling. Moreover, the ability of operating 5-axis CNC controller can be trained. At the beginning of the course, we create manually G-code CNC programs to simulate the tool-path. Then we use effectively CAD / CAM systems in order to produce the final NC code for the manufacturing of various mechanical parts.

#### **23044 可程式控制與實習**

**3, 選**

**陳金山, 上**

本課程要旨為訓練學生能實際操作可程式控制器之能力。包括，程式撰寫，週邊設備架設，系統安裝與維修。

### **23044 Programmable Logic Controller internship 3, S Chen,Chin-Shan, F**

The purpose of this course is to introduce the most-used programmable logic controller (PLC) in industries, with sensors, actuators, Signals Processing, Human Machine Interface, etc., to control the mechanism to reach the function. In addition, this course is to cultivate our students to acquire the professional skills certifications of Mechatronics from the Ministry of Labor, too.

#### **22403 電腦輔助工程分析與實習**

**3, 選**

**王栢村, 下**

本課程介紹應用電腦於工程設計問題。使用有限元素法為基礎之電腦輔助工程分析軟體 ANSYS，學生必須練習系列之工程範例以瞭解有限元素模型化技術，包括前處理、求解及後處理，俾使具備從理論到數值分析工具應用之實務經驗。課程重點在將設計技術應用到各類之工程結構，如桁架、樑、平面機械元件和組件，也將同時介紹結構振動、熱應變應力設計以及最佳化分析。

### **22403 Computer Aided Mechanical Engineering Analysis 3, S Bor-Tsuen Wang, S**

This course introduces the design via computers. The finite element method based, computer-Aided Engineering (CAE) software, ANSYS, is introduced. Students are required to run a series of examples to understand the finite element modeling technique, including preprocessing, solution and post-processing, and trained to have "hand-on" experience in going from the theoretical principles to a numerical solution tool. The emphasis is on the design techniques to varieties of engineering structures, including frames, beams, planar machine elements and joints. Structural vibration and thermal stress design analysis as well as optimization will also be introduced.

#### **23081 機械人與視覺系統**

**3, 選**

**林宜弘, 下**



本課程內容包含：視覺系統介紹、視覺系統檢測部、影像處理技術、實例剖析、打光技術以及影像程式設計等相關主題內容，此課程的教學內容主要訓練學生具有學理與實際設計之能力。

### **23081 Machine Vision technology and application 3, S Yi-Hong Lin, S**

The contents of this course include the introduction of machine vision, the sensor of machine vision, image processing technique, applied examples, lighting technique and image software design. This course is aimed to teach students with the ability of theoretical study and practical design.

### **22404 數位電子與實習 3, 選 , 下**

本實習課程使用程式軟體為 MAX + PLUS II V10.1 作為開發軟體設計，適合於 CPLD / FPGA 晶片之設計。依程式設計的方式分為兩部份，第一部份以繪圖輸入法為主要的設計方式，練習設計基本數位邏輯閘與組合邏輯電路。第二部份則以波型編輯與硬體描述語言 VHDL 為主，練習 VLSI 之電路設計。

### **22404 Digital Electronics Lab 3, S , S**

Altera's software: MAX + PLUS II V10.0 will be used to design CPLD / FPGA chips in this experiment and be practiced. From their different design methods, two parts will be practiced. First, using graphic input method to design the basic logic gate and combine digital circuits. Second, wave editor and VHDL language (very high speed integrated circuit hardware description language) will be used to design the VLSI system.

### **22452 機電整合與實習 3, 選 陳金山, 下**

本課程主要學習機電整合系統之相關元件及其基本架構。內容包括控制系統架構及微處理器控制系統介紹、機電特性簡介、運算放大器各種應用電路設計與信號調整、電力控制半導體、感測器、機電元件匹配與介面等。本課並安排電腦實習來輔助正課重點內容學習。

### **22452 Mechatronics and lab 3, S Chen, Chin-Shan, S**

This course studies the basic practice of electromechanical system components and structures. It introduces basic control system components and configuration, from feedback control system structure and microprocessor-based control system to components realization such as mechanical system design, power driver circuits design and sensor selection; topics include interface circuits between the mechanics and electronics, operational amplifier design and signal conditioning. Computer simulation lab is provided to assist major topics study.

### **23087 電腦輔助機械振動分析與實習 3, 選 王栢村, 上**

本課程介紹電腦軟體於工程分析之應用，著重於介紹有限元素方法之基本原理，理論及求解方法之推導，同時介紹使用有限分析軟體，使學生由實例分析了解有限元素模型之架構，包括前處理、求解及後處理程序，使學生具備由理論分析到數值求解之實際經驗，課程著重於有限元素分析之基本概念之建立與應用，作業涵蓋結構靜力、熱傳及動態分析等問題。

### **23087 Computer Aided Mechanical Structural Analysis 3, S Bor-Tsuen Wang, F**

This course introduces the application of computer software to engineering analysis and emphasized on the fundamental and principles of finite element method. Basic theory and algorithm developments are presented. A commercial finite element software is also introduced and allows students to run a series of examples to understand the finite element modeling technique, including preprocessing, solution and post processing. The students are trained to have "hand on" experience in going from theoretical principles to a numerical solution tools. Emphasis is on the reinforcement and application of finite element basic concept. Homework will cover the problems in structural static, heat transfer and dynamics analysis.

### **20200 生物醫學工程概論 3, 選 張莉毓, 上**

生物醫學工程學是一個使用工程學手段分析和解決醫學問題的學科。該學科涉及諸多的領域，是一門典型的交叉學科，吸引了大批致力於人類健康的研究人員。本課程劃分為五個模組：生物信號處理、生物醫學成像、生物材料、生物物理、生物資訊學。課程主要介紹如何應用基本物理理論和工程方法對生物系統進行量化的分析，同時還將介紹這些領域的最新發展動態。

### **20200 Introduction to Biomedical Engineering 3, S L. G. Teoh, F**



A biomedical engineer uses traditional engineering expertise to analyze and solve problems in biology and medicine, providing an overall enhancement of health care. It turns out that lots of people have a common interest of trying to improve human life, which exploits the many specialty areas inside of the field of Biomedical Engineering. The course is organized into modules consisting of five tracks: biosignal processing, Biomedical imaging, Biomaterials, Biophysics, Bioinformatics and computational. Application of basic principles of physics and engineering science to the quantitative analysis of biological systems will be highlighted. In addition, applications of technology to address contemporary issues and various roles of the engineer will be discussed.

**22632 軟性電子製程技術****3, 選****周春禧, 上**

本課程主要介紹軟性電子製程技術, 就軟性電子的特點說明市場與應用趨勢, 其授課內容包括薄膜沉積、微影蝕刻、雷射原理、電極圖案化、捲對捲傳輸與先進封裝等製程技術與設備, 並舉出軟性電子應用(例如:軟性顯示器、軟性太陽能電池與軟性感測器等)。讓學生了解未來投入相關產業該具備的技術。

**22632 Flexible Electronics Process 3, S****Chou,Chuen-Shii, F**

This course is designed to introduce flexible electronics process and describes the market and application trend. The content includes the thin film, lithography, etch, principle of laser, electrode patterning, Roll to Roll process, advance packing and applications (including flexible display, flexible solar cell and flexible sensor applications). The course will offer the basic knowledge relative to flexible electronics field.

**22978 自動化技術****2, 選****林宜弘, 下**

以『控制』的觀念為主, 培養自動化控制的能力, 並能應用機器設計的能力, 以構想出一套自動化設備之能力。課程內容包括自動化流程的設計, 自動化元件與感測器使用知識, 自動化裝配系統的設計, 可程式控制器技術, 此課程培訓學生具有實務性的設計能力, 使學生瞭解可程式邏輯控制器的程式撰寫觀念與技巧, 養成可程式邏輯控制器的實務應用能力。

**22978 Automatic Engineering****2, S****Yi-Hong Lin, S**

Automatic Engineering is very important technique applied in industrious area. This course will introduce the design automation process, the useful knowledge of automatic devices and sensors, the automatic assemble system design and PLCC controller technique. The goal of this course will train students with the strong fundamental discipline automatic engineering and practical design ability.

**23075 MATLAB 於數值分析與實習****3, 選****王栢村, 下**

本課程將介紹應用 MATLAB 軟體於各種工程常見數學問題之理論與數值解析方法。數值分析方法之應用, 包括: 數值微分、數值積分、非線性方程式、插值法、矩陣運算、聯立方程式及特徵值問題、常微分方程式、偏微分方程式、統計分析等。培養學生具備敬業、負責、勤奮、合作等職業道德及良好之陸地車輛動力學之分析方法課程中將介紹 MATLAB 軟體應用之基本指令, 包括: 數值運算、函數使用、陣列應用、邏輯控制、迴圈控制、函數庫、圖形繪製、視窗應用等主題。

**23075 Application of MATLAB to Numerical Analysis 3, S****Wang,Bor-Tusen, S**

This course introduces the application of MATLAB software to theoretically and numerically solve various kinds of engineering mathematical problems. The course will introduce MATLAB Basic commands, including numerical operation, functions, array, logic control, loop control, subroutines, graphic control, and graphic-user-interface (GUI). Application of numerical analysis methods includes numerical difference, numerical integration, nonlinear equation, interpolation method, matrix operation, linear system equation, eigenvalue problem, ordinary differential equation (ODE), partial differential equation (PDE) and statistical analysis.

**23265 機器人手臂控制系統與實習****3, 選****林宜弘, 下**

本課程要旨為介紹工業用機械手臂之控制系統, 工業用機械手臂之控制最常用為伺服控制器, 其優點為精確、功能大、及擴充性大。課程內容包括: 伺服控制系統軟硬體介紹、撰寫程式、安裝及維修。

**23265 Control System and Practice of Robot Arm****3, S****Yi-Hong Lin, S**

The purpose of this course is to introduce the controlsystem of robot arm in industries. The advantages of servo controller are precision and easy-expand. The course includes as follow : Hardware and software of servo control system, Programming of servo control system, Maintaing and Installing of servo control system.

### 20343 材料機械性質

3, 選

趙志燁, 下

本課程主要探討材料在受力情形下的行為與應變，主要內容計有：應力與應變、基本塑性理論、單晶之塑性變形、差排理論、強化機構、破裂分析、金屬疲勞與潛變、金屬塑性成形。

### 20343 Mechanical Metallurgy

3, S

C. Y. Chao, S

In this coarse, Mechanical Metallurgy of Metal Mechanical metallurgy is the area of knowledge, which deals with the behavior, and response of metals to applied forces. The main topics of this course are including stress and strain, element of theory of plasticity, plastic deformation of single crystal, dislocation theory, strengthening mechanisms, fracture, creep and stress rupture, fatigue of metal, plastic forming of metals.

# 休閒運動健康系實用休閒觀光專班

Department of Recreational Sport and Health Promotion

## 一、必修科目 Required Courses

### 642002 人體解剖學 2 必

本課程之目的在教導學生了解人體之基本構造，包括肌肉、骨骼、關節、結締組織及神經系統等，並將其理論運用在運動指導與運動技能之發展。

### 642002 Human Anatomy 2 R

The purpose of this course is to introduce the basic structure of human body such as muscles, bones, joints, connective tissue and nervous system...etc., in addition, to apply this knowledge to develop the sports guidance and sports skills.

### 642003 舞蹈運動與指導 2 必

本課程之目的在透過舞蹈運動之教學，讓學生舞蹈運動之過程中，體驗身體律動之感受，學習控制自我肢體肌肉之能力，並從而學習各項舞蹈之基本知識及指導方式。其內容包括有氧舞蹈、韻律律動、社交舞、現代舞等。

### 642003 Dance and Guidance 2 R

The purpose of this course is to introduce the comprehensive concept and skill of dance, in addition, to cultivate learners' guide ability in dance is also emphasized in this course.

### 產業職場實務 1 1 必

為貫徹以培養實務能力為課程目標之精神，藉由至廠商端實習，了解各類型相關專業領域之實務工作，並且透過實習強化休閒服務業相關之專業素養，建立業界與學界良好互動模式。

### Industrial Workplace Practices 1 1 R

In order to implement the spirit of cultivating practical ability as the course goal, through internships at the manufacturer end, understand the practical work of various types of related professional fields, and strengthen the professional quality related to the leisure service industry through internships, and establish a good interaction model between the industry and academia.

### 休閒運動與指導 1 2 必

以動態性身體活動為方式，希望學生透過運動的技術練習、規則講解、分組個人與團隊練習等，提升學生對各類休閒運動之技能，並增進運動指導之能力。

### Recreational Sport and Instruct 1 2 R

With dynamic physical activities, students are expected to improve their skills in various recreational sports and enhance their ability to instruct sports through sports technical exercises, rule explanations, group personal and team exercises, etc.

### 642020 運動心理學 2 必

本課程之目的在介紹運動心理學之理論與實務，如動機參與、競賽焦慮、團隊凝聚力等理論，並教導學生應用心理輔助技巧於運動領域。

**642020 Sport Psychology 2 R**

The purpose of this course is to introduce the theory and practice of sport psychology. Topics included in the class are as follows: motivation for participation, sport stress, and team cohesion. More importantly, students will learn how to apply psychological counseling techniques in sport field.

**642003 休閒遊憩經營管理 2 必**

本課程之目的希望將管理學的企業功能與管理功能，充分應用至休閒遊憩產業，希望學生在學習過程中不斷應用、創新，對於未來進行休閒遊憩產業經營時，可達高品質與高效率之效益。

**642003 Leisure and Recreation Management 2 R**

The purpose of this course is to make full use of the functions and management functions of management in the leisure and recreation industry. We hope that students will continue to apply and innovate in the learning process and achieve high quality and high efficiency for the leisure and recreational industry in the future benefit.

**產業職場實務 2 1 必**

為貫徹以培養實務能力為課程目標之精神，藉由至廠商端實習，了解各類型相關專業領域之實務工作，並且透過實習強化休閒服務業相關之專業素養，建立業界與學界良好互動模式。

**Industrial Workplace Practices 2 1 R**

In order to implement the spirit of cultivating practical ability as the course goal, through internships at the manufacturer end, understand the practical work of various types of related professional fields, and strengthen the professional quality related to the leisure service industry through internships, and establish a good interaction model between the industry and academia.

**休閒運動與指導 2 2 必**

以動態性身體活動為方式，希望學生透過運動的技術練習、規則講解、分組個人與團隊練習等，提升學生對各類休閒運動之技能，並增進運動指導之能力。

**Recreational Sport and Instruct 2 2 R**

With dynamic physical activities, students are expected to improve their skills in various recreational sports and enhance their ability to instruct sports through sports technical exercises, rule explanations, group personal and team exercises, etc.

**642038 運動體能訓練 2 必**

本課程介紹運動訓練學的各項理論，及運動競賽時應用的時機。除了理論的介紹外，也研讀近年有關運動訓練的研究。期能將理論與實務結合，於未來提升運動員的成績。

**642037 Sports Conditioning Training 2 R**

The purpose of this subject is to introduce training theories and when and how to use these theories. In addition to the introduction of training theories, graduate students are instructed to research the latest reports and studies. We hope that a combination of theories and practice can promote athletes' performance in the future.

**642007 觀光資源概要 2 必**

教授觀光資源概要及介紹觀光遊憩資源定義與特性，具備初步與通盤的理解及概念，



並增進領隊導遊考試之能力。主要包含：觀光遊憩資源定義與特性、觀光資源分類、觀光遊憩資源開發基本原則與永續發展策略，介紹台灣的觀光遊憩資源：國家公園、國家風景特定區、古蹟、自然保留區，並強調觀光資源相關法規與維護的重要性。

#### **642007 Introduction to Tourism Resources 2 R**

Teaching tourism resources overview and introduction the definition of tourism resources and characteristics, with an initial understanding and with the overall concept and enhance the ability of test leader guides. Mainly includes: the definition of tourism resources and characteristics, tourism resources, classification, tourism resources of developing the basic principles and sustainable development strategy, described Taiwan's tourism resources: national parks, national scenic areas, monuments, nature reserves, and stressed that tourism resource-related laws and regulations and the importance of maintains.

#### **642009 統計學 2 必**

本課程目的在教導學生了解基礎統計學原理，並正確使用統計分析軟體，正確解釋分析結果，並能正確呈現結果於正式報告中。

#### **642009 Statistics 2 R**

The purpose of this course is to introduce the basic theory of statistics, teach students how to use statistics software properly, explain the output correctly, and to wrap up the results in the formal report.

#### **642021 運動處方 2 必**

本課程之目的在教導學生建立正確之運動處方開立之概念，其內容包括肌肉適能、心肺適能、柔軟度、身體組成．．等之運動處方開立之原則。期透過課程之實際經驗，協助學生增進其運動指導及處方開立之正確觀念。

#### **642021 Exercise Prescription 2 R**

The object of this course is to teach students having correct concept of sports prescription, which include muscle fitness, cardio respiratory fitness, limpness, and body composition. Students will have the basic concept of sports guidance, and sports prescription through the actual practice.

#### **642026 休閒運動方案企劃實務 2 必**

休閒運動發展在台灣已邁入另一個嶄新的里程碑，現今各大城市極力開發運動觀光財(如申辦大型國際賽事，棒、足球賽、馬拉松等；及外國職業隊冬訓等)，並有效帶動周邊附屬產業成長與城市行銷。

本課程目的在培育產業專業領導人才及運動行銷公司專業人才能力養成。授課內容包括：產業發展趨勢與轉型、企劃專業人員角色、方案企劃與執行、方案評估與考察等四個方向，並透本課程案例分享、實際訪視(訪談)，有效引導學員內在探討與分享。

#### **642026 Leisure sports program planning practice 2 R**

Leisure sports development has entered another new milestone in Taiwan. In today's major cities, great efforts are being made to develop sports and tourism attractions (such as bidding for major international events, baseball, football, marathons and winter training for foreign professional teams) and to effectively promote peripheral affiliations Industrial Growth and Urban Marketing.

The purpose of this course is to nurture industry professionals and sports marketing professionals to develop professional ability. The course contents include: industrial development

trends and transformation, the role of planning professionals, program planning and implementation, program evaluation and inspection in four directions, and through the case to share the case, the actual visit (interview), effectively guide students to explore and share.

### **642096 戶外遊憩領導**

**2 必**

本課程主要目的在培養學生戶外遊憩活動的領導與引導能力，透過領導與引導理論的介紹，學習戶外遊憩活動的進階知識與技能，並實際參與戶外遊憩活動的帶領。

### **642096 Leadership for Outdoor Recreation 2 R**

The purpose of this course is to train students to practice advanced leadership and facilitation in outdoor recreation activities through the introduction of theory and practice as well as the integration of knowledge of skill. Also, students are required to actually participate in leadership for outdoor recreation activities.

### **642017 水上活動與安全指導**

**2必**

本課程之目的在於培養學生游泳技能與安全知識，並應用於教導、規劃、執行水域各類型休閒活動。

### **642017 Coaching of Water-based Sports and Safety 2R**

The purpose of this course is to introduce the basic swimming skills and safety knowledge. The related topics will include instruction/design abilities of recreational activities of waterside.

### **642011 運動傷害防護學與實驗 2 必**

本課程之目的在培養學生正確的運動傷害防護之概念，並訓練熟練正確之運動傷害防護實作技術應用於職場上，內容包括運動傷害病理學及上肢各關節部位之介紹。

### **642011 Principle and Practice in Athletic Training 2 R**

The purpose of this course is to introduce the theoretical background of Sports Injury Prevention, in addition, application of the comprehensive concept into the practical circumstance is also emphasised. The content includes mechanisms and characteristics of musculoskeletal and nerve trauma, tissue response to injury and introduction of various joints in the upper extremity.

### **642012 體適能與肌力訓練**

**2 必**

體適能可分為健康適能及運動適能，兩者相互聯繫，而健康體適能是所有體適能的基礎。健康適能包含的要素有：心肺耐力適能、肌力適能、肌耐力適能、柔軟性適能、身體組成。運動適能包含的要素有：協調性、速度、爆發力、平衡性、敏捷性、反應時間。肌力訓練：利用各種不同的訓練方式來達到增加肌肉量的訓練，所以只要是能夠「增加人體肌肉力量的訓練」，就是「肌力訓練」。

本課程目的即在透過學理基礎的教授，以及實務操作的訓練，培養學生在體能訓練指導方面之技能與知識。

### **642012 Fitness and Strength Training 2 R**

Physical fitness can be divided into healthy fitness and exercise fitness, the two are linked to each other, and healthy fitness is the basic foundation for all physical fitness. Elements of healthy fitness include: cardiorespiratory endurance, muscle strength, muscle endurance, flexibility, and body composition. Exercise fitness include the elements: coordination, speed, power, balance, agility, and reaction time. Strength Training: Use a variety of training methods to achieve increased muscle training, so long as it is able to "increase the training of human muscle

strength," is "muscle training."

The purpose of this course is to train students' skills and knowledge of physical training coaching through the academic teaching and practical training.

### **產業職場實務 3**

**1 必**

為貫徹以培養實務能力為課程目標之精神，藉由至廠商端實習，了解各類型相關專業領域之實務工作，並且透過實習強化休閒服務業相關之專業素養，建立業界與學界良好互動模式。

### **Industrial Workplace Practices 3 1 R**

In order to implement the spirit of cultivating practical ability as the course goal, through internships at the manufacturer end, understand the practical work of various types of related professional fields, and strengthen the professional quality related to the leisure service industry through internships, and establish a good interaction model between the industry and academia.

### **休閒運動與指導 3**

**2 必**

以動態性身體活動為方式，希望學生透過運動的技術練習、規則講解、分組個人與團隊練習等，提升學生對各類休閒運動之技能，並增進運動指導之能力。

### **Recreational Sport and Instruct 3 2 R**

With dynamic physical activities, students are expected to improve their skills in various recreational sports and enhance their ability to instruct sports through sports technical exercises, rule explanations, group personal and team exercises, etc.

### **642004 人體生理學與實驗**

**2 必**

本課程之目的在增進學生對於人體基礎生理構造及機轉之認識並以其為根基進而活用於運動專業領域。

### **642004 Human Physiology**

**2 R**

The purpose of this course is to introduce the physical structure of the human body, and the relationship between the human physiology and daily life. Students will apply this knowledge to the related courses after learning. It includes physical structure and organs of human body.

### **642016 服務業管理**

**2 必**

本課程針對服務業之管理暨實地參與學習服務作探討，課程包函學生戶外社區服務實習暨服務業的本質與定義、顧客需求、服務系統設計與作業管理、服務地點與佈置、服務業人力資源與行銷管理、服務等候線管理及服務品質管理與顧客滿意等。經此課程的學習可使同學真正瞭解服務業管理的內容，並安排實地參與學習且導入資訊科技的運用以改善服務業之效率與效能。

### **642016 Service Industry Management 2R**

This course for the management of the service involved in learning and on-site services to probe further into the curriculum package letter outdoor student internships and community service with the definition of the nature of the service industry, customer demand for services, system design and operations management, service and location arrangement, the human services sector Resources and marketing management, service management and service lines to wait for quality management and customer satisfaction, and so on. After learning this course will enable students to truly understand the management of the service, and arrange on-site and participate in

the study into the use of information technology to improve the efficiency and effectiveness of the service industry.

### **642028 實務專題 3 必**

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。

### **642028 Special Projects 3 R**

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.

### **642100 運動推拿指壓學 2 必**

此課程目的在使學生瞭解推拿指導之基本理論，並使其具備應用於運動之相關能力。

### **642100 Sports/Exercise Massage and Practice 2 E**

The purpose of this course is to introduce the basic concepts and skills of massage to relax the muscle. In addition, students are expected to build the advantages on sports massage after taking this course.

### **642018 團體運動訓練與指導 2 必**

其目的是輔助學生對團體運動的參與者能夠充分運用指導能力而開發。學習體適能之五大要素：肌力、肌耐力、柔軟度、心肺功能、身體組成。由實作之過程中，發展本身之體適能及創造出各種模式之體適能活動，以增進其課程設計及運動指導之能力。

### **642018 Group Sports Training and Guidance 2 R**

The purpose is to assist the student participants in team sports can make full use of coaching skills and development. Five elements to learn physical fitness: muscle strength, muscle endurance, flexibility, cardiopulmonary function, body composition. In the process of implementation, we develop our physical fitness and create various modes of physical fitness activities so as to enhance their ability in curriculum design and sports instruction.

### **642013 運動行銷學 2 必**

本課程之目的在使學生正確瞭解休閒運動市場中消費者的需求，並透過行銷研究以擬定行銷策略以符合當前之休閒運動消費。

### **642013 Sport Marketing 2 R**

The purpose of this course is to introduce the system of sports markets, in addition, by marketing research, students is expected to submit several proposals to improve the consumers' satisfactions.

### **產業職場實務 4 1 必**

為貫徹以培養實務能力為課程目標之精神，藉由至廠商端實習，了解各類型相關專業領域之實務工作，並且透過實習強化休閒服務業相關之專業素養，建立業界與學界良好互動模式。

### **Industrial Workplace Practices 4 1 R**

In order to implement the spirit of cultivating practical ability as the course goal, through internships at the manufacturer end, understand the practical work of various types of related professional fields, and strengthen the professional quality related to the leisure service industry through internships,



and establish a good interaction model between the industry and academia.

## 休閒運動與指導 4 2 必

以動態性身體活動為方式，希望學生透過運動的技術練習、規則講解、分組個人與團隊練習等，提升學生對各類休閒運動之技能，並增進運動指導之能力。

### Recreational Sport and Instruct 4 2 R

With dynamic physical activities, students are expected to improve their skills in various recreational sports and enhance their ability to instruct sports through sports technical exercises, rule explanations, group personal and team exercises, etc.

## 642010 體驗與探索教育 2 必

本課程主要目的在探討體驗教育在休閒運動產業之基本概念與應用技術本課程主要目的在介紹體驗與探索教育領域之基本概念與技巧。授課內容包括：體驗教育的理論、平面探索活動、探索體驗活動與服務學習方案執行。

### 642010 Experiential and Adventure Education 2 R

The purpose of this course is to introduce the basic ideas and skills for experiential and adventure education. The contents of this course included: theory for experiential education, portable adventure activities, adventure activities and service-learning project.

## 642010 運動生理學與實驗 2 必

本課程目的為將人體生理學的知識應用在運動員，特別是當人體暴露在急性與慢性的身體活動時，人體結構與功能的改變。再者，運動時體內能量的來源與運用也是焦點之一。

### 642010 Exercise Physiology and Energy Metabolism 2 R

The purpose of this subject is to apply human physiology to people who engage in exercise, especially for the fact that the human functions and structures change when they expose to acute and chronic physical activities. Moreover, energy source and application during exercise are one of focuses in this subject.

## 642023 領隊導遊實務 2 必

此課程將會授與學生領隊與導遊實務方面的技巧與觀念，重要的是將來從事此一行業的正確工作態度與服務的精神，從而認清領隊與導遊的工作真相，以便及早調整自己的就業方向。

### 642023 Practice of Leadership and Guidance 2 R

The course will introduce the conceptions and skills of leadership and guidance for students as to understand the working connotation of leadership and guidance. It also cultivates students to have the convenient attitude of service to looking for a good job.

## 642048 餐飲服務技術及實務 3 選

1.本課程以餐飲服務之服務品質與顧客滿意度為基礎，主要目的希望能夠為學生們找出對服務的熱忱。

2.瞭解餐飲的組織與職責及準備作業；包括營業前後的準備、餐具佈置、餐飲服務技術。

3.有了餐飲服務技術概念和操作基礎，讓同學從分組討論、練習，尋求合作的默契與分享，更學習到互相尊重彼此創意的美德。

### 642048 The Skill of Restaurant Service and Practice 3 E

- 1.To enhance the quality of restaurant service and customer satisfaction. We hope we can help students to find the service enthusiasm.
- 2.To understand correct preparation procedures, including preparations before and after business time, utensil arrangement and service skills.
- 3.To learn respecting others' creativity by means of groups discussion, practice and cooperation.

## **642077 國際禮儀與實務**

### **3 選**

許多人都認為禮儀等有需要的時候才來學就好了，其實不然，每天只要接觸人群就有禮儀來約束行為規範。

歐美日本等國家從小就培養幼童尊重別人，要讓禮儀（食、衣、住、行、育、樂）融入日常生活中，才能獲得很好的友誼及開拓自己的人際關係，所以文明國家，社會層次愈高者愈有禮貌，所謂「樹木不經日曬雨淋不長高，人格未經千錘百鍊不健全」，大家應該學習稻穗精神，愈飽滿腰身彎的愈低，才能獲得別人的敬重。

人與人相處的關鍵，幾乎都是在生活小細節的關照與彼此的尊重，所以「對上要敬；對下要慈；對人要和平」有一句話說「願要大，志要堅，氣要柔，心要細」是詮釋做人處世要退一步海闊天空。

禮儀教育絕對不是上流社會的附屬品，它是全民教育。

## **642077 International manners and practice 3 E**

In western countries, good manners are taught from childhood. They can obtain long friendship and broaden relationship from respecting others. As a result, the higher the social statue of people, the more polite they are. People should learn from the spirit of modesty. To respect and care each other is a key point among people. Manners education is a whole people education, not an accessory in higher society levels.

傳閱附件 8---109 學年度第 2 學期教師申請開授通識課程大綱

## 109 學年度第 2 學期教師申請開授通識課程中英文課程大綱

### 1. 近代西方文明發展 The Development of Modern Western Civilization

中、英文課程綱要：

課程綱要

本課程之目標，在增進學生深入且有系統的了解 15 世紀以來的西方文明。討論的範圍，主要以西方階段性的歷史發展為主，課程重點在透過介紹西方近代歷史重大事件，來了解其歷史演進，並介紹宗教與文化形成、新思潮與新國家社會、近代科技演變、大眾文化與資訊傳播，暨現代醫療研究等主題，藉以達到增進學生的在地與全球性思考、人文關懷與社會適應能力，並培養文化修養與科學知識能力等目標。

The goal of this course is to facilitate students' knowledge about the modern western civilization since the 15th century. The topics of this course feature on historical events of different era and from these discourses to let students understand the evolution of history, the formation of modern society and religion, the relation between new thoughts and nation, development of modern technology, mass media and information communication, and modern medicine evolution, etc. All these lectures above would help students to strengthen the idea between global and local thinking, the ability of humanistic care and social adaption, and to cultivate the cultural behavior and science technology.

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### 2. 廣告與企劃文案寫作 The Advertisement and Planning Copywriting

中、英文課程綱要：

本課程之教學內容重點在以下三方面：

1. 了解何謂廣告，以及廣告在行銷中所扮演的角色。
2. 分析評論市面上之廣告，從中學習其行銷策略。
3. 學習廣告文案之思考與製作。

Course description:

There are three main sections of this class:

1. Understanding the content of advertising and the role it plays in marketing communication.
2. Analyze and discuss on the advertising on market, to learn the marketing strategies of advertising.
3. Practice making advertising plans and copywriting.

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### 3. 東南亞社會文化 Society and Culture of Southeast Asia

中、英文課程綱要：

一、中文：

近年來，東南亞發展快速。不論是政治、經濟、社會或人文藝術都引起國際的注意。本課程設計主要是讓同學瞭解東南亞的歷史、文化和風俗民情，課

程設計有兩項重點：首先，希望透過對東南亞社會與人文的介紹，讓大學部的同學能有「主題性」的認識「台灣的東南亞」以及「東南亞的台灣」。其次，本課程希望透過現代東南亞國家較為關鍵的議題的討論與分享，來邀請國內東南亞區域研究專家學者或影片欣賞的方式，來深耕同學對「東南亞」的解構觀點。

因此上課主要分為三部份：(1)台灣與東南亞；(2)東南亞的文化概覽；(3)東南亞的現代社會。課程將配合影片播放，應是一門符合「通識精神」的課程。

In recent years, Southeast Asia has been developing rapidly. Whether the politics, economy, society, humanities science, and the arts in Southeast Asia, its role has attracted attention domestically and internationally. The course named as 'Society and Culture of Southeast Asia' is designed to help students understand the history, culture, and society of Southeast Asia. Two main themes in my class:

Firstly, with the pedagogy of the introduction of Southeast Asian society and humanities, students could have a whole inter-subjective understanding.

Secondly, this course is designed to invite Southeast Asian regional research experts and scholars, and designed via discussions and sharing of more critical issues in modern Southeast Asian countries in order to deepen students' deconstructive views on the concept of "Southeast Asia".

Therefore, the course is divided into three parts: (1) The relationship between Taiwan and Southeast Asia; (2) A cultural perspective of Southeast Asia; (3) Modern society in Southeast Asia. Besides of class pedagogy, the course will be introduced with Southeast Asian Market touring in Pingtung and some Southeast Asia film-recordings.

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#### 4. 國際禮儀 International Etiquette

中、英文課程綱要：

本課程旨在介紹正確的國際禮儀規範，以食、衣、住、行、育、樂及溝通等主題來進行說明，來傳承商業與外交禮儀的潛規則，讓學生能感受各種禮儀的正確表現外，並透過實際的演練深烙心中，在日常生活、職場領域和商業場合中，便能運用自如，有禮待人，也受人尊重。

This course aims to introduce correct international etiquette norms. This course explains the topics of food, clothing, housing, transportation, education, entertainment and communication to inherit the hidden rules of business and diplomatic etiquette. In addition to understanding the correct performance of various etiquettes, students can perform practical exercises. The purpose is to make students be respectful and respectful in their daily life and workplace.

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#### 5. 口碑資料科學 Word-of-Mouth Data Science

※全英語授課

Course Objectives:

1. Understand the importance and impact of word-of-mouth data science in life.



2. Understand the logical thinking and design principles of word-of-mouth data science in thick data.
  3. Understand the logical thinking and design principles of electronic word-of-mouth data science in big data.
  4. Pay special attention to the ethics of community word-of-mouth, Internet etiquette, and information security issues.
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## 6. 飲食文化與科學 Food Culture and Science

中、英文課程綱要：

人類是異營性的動物，通過攝食外部的養分得以維持生命。因此食物伴隨著人類文明發展，形成了獨特的文化特徵。本課程將結合科學技術和社會人文的觀點來探討以下議題：

- (1) 人類飲食的需求及飲食文化的發展歷程；
- (2) 食品材料的取得和製備方法的發展，及其背後的科學原理；
- (3) 不同民族的獨特飲食文化是如何形成的，
- (4) 東方傳統文化所傳承的自然醫學，其中的藥食同源觀念；
- (5) 台灣多民族融合飲食文化的形成。
- (6) 學習現代食品工業和餐飲行業如何在兼顧傳統風味和食品安全；
- (7) 現代農業生產和食品供應的技術提升如何影響人類飲食消費行為的改變。
- (8) 食品安全觀念如何進入飲食生活教育體系，確保衛生和安全。

在全球環境快速變遷的今天，本課程將著重於介紹食品相關從業人員如何通過食農教育推廣和科學創新，不但提高食物的安全與價值，提升學生對自身飲食的認知和重視，進而創造社會永續發展和美好生活。

Human beings are heterotrophic animals, which maintain their life by feeding on external nutrients. Therefore, along with the development of the civilization, food has formed its unique cultural characteristics. This course will explore the following topics from the perspectives of food science, technology and social humanities:

- (1) The demand of human diet and the formation of food culture;
- (2) The acquisition of food materials and the development of preparation methods, as well as the scientific principles behind them;
- (3) How did the unique food culture of different nationalities come into being,
- (4) The concept of Chinese medicine with food, the natural medicine inherited from the oriental traditional culture;
- (5) The formation of Taiwan's multi-ethnic food culture.
- (6) Learn how the modern food industry and catering industry take into account the traditional flavor and food safety;
- (7) How does the technology improvement of modern agricultural production and food supply affect the change of human diet consumption behavior.
- (8) How can the concept of food safety enter the education system of diet life to ensure health and safety.

In today's rapidly changing global environment, this course will focus on introducing how food related practitioners can not only improve the safety and value of food, but

also enhance students' awareness and attention to their own diet through food agriculture education promotion and scientific innovation, so as to create sustainable social development and a better life.

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## **7. 台灣自然資源與生態旅遊 Natural Resources and Ecotourism in Taiwan**

※全英語授課

Course Objectives:

- 1.Understand the types and distribution of natural tourism resources in Taiwan.
- 2.Recognize the characteristics of Taiwan's geographical environment and ecotourism resources.
- 3.Understand the characteristics of Taiwan's ecotourism and natural attractions.
- 4.Learn about the collection of information on ecotourism attractions and plan sustainable and healthy tourism itinerarie