

## 110 學年度第 1 學期第 1 次 校課程委員會議

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傳閱附件 1-1--本校各學院所屬各系(所)課程中英文摘要-農學院

## 各系(所)中心新增課程中英文摘要

### 一、 農學院

#### (一) 植物醫學系：

##### 蟲害案例分析與策略

2 選

陳文華

本課程主要介紹害蟲危害作物的徵狀，危害的過程與造成的傷害，並討論不同害蟲造成相類似的危害狀如何區辨，而蟲害、蟎害、病害與非生物性病害之間的差異，讓同學藉由不同案例了解它們之間的關聯性，並制定蟲害管理策略

##### Insect pest case analysis and strategy

2 E

W.H. Chen

This course mainly introduces the symptoms of pests damage crops, the process and the damage caused, and discusses how to distinguish the similar symptoms caused by different pests, and the difference between pests, mites, diseases and otherwise. With different cases so that students understand the correlation between them, and develop pest management strategies..

#### (二) 食品科學系：

##### 食品過敏原分析

3 選

本課程的目的旨在讓學生了解食品過敏及食品過敏原分析之基本知識及原理，包括如何利用儀器分析方法定量食品過敏原及測定過敏原結構。本課程探討之方法包括紅外光光譜法、免疫分析法及質譜法等。。

##### Analysis of Food Allergen

3 E

This course is designed to familiarize students with basic knowledge and fundamental principles in the field of food allergy and food allergen analysis. We aim to introduce how allergen content or structure in food samples could be analyzed by instrumental analytical methods. The analytical methods discussed in this course include infrared spectroscopy, immunoassay and mass spectrometry etc.

## 二、 工學院

### (一)環境工程與科學系：

#### 環境實務實習

3 選

空氣、廢水、廢棄物、土壤、環境教育原理及實務應用為實習課程之主軸。

學生藉由在實習場所操作空氣、廢水、廢棄物或土壤等相關儀器設備系統及維護，或參與計畫執行的品管流程及手段，進而整合個人在環工領域的專業知識，獲取儀器性能維護、改善空氣污染、廢棄物處理、廢水處理、地下水整治及土壤復育等相關專業知識。實習課程將有拓展學生視野，學習與人相處或解決環境問題的實務經驗。

#### Environmental Practice

3 E

The principles and practical applications in air, wastewater, waste, soil, and environmental education are the main centerpieces of the course. Students will practice operating professional equipment and systems. Students will also participate in the implementation of a quality control program. Students can integrate the expertise of individual workers in the field during project participation and therefore gain experience in assessing instrument maintenance, air quality improvement, waste disposal, wastewater treatment, groundwater remediation, soil rehabilitation, and related professional disciplines.

Internships in this practical training will offer practical experience for expanding student horizons, learning to get along with people, and solving environmental problems.

#### 環境工程實習

3 選

環境工程實習是 理論和實務並重 讓學生學以自用，內容包括 資源回收分類實習 污水場操作 空氣污染調查，藉由在學中所學理論與實作加以應用與實現。

#### Environmental Engineering Practical Training 3 E

Environmental engineering practice is the theory and practice and to allow students to learn for their own use. The course is including resource recycling classification practice sewage field operation, air pollution survey. By studying in the theory and practice are applied and realized.

#### 環境科學實習

3 選

使環工系學生能夠在修習本課程之後，獲得環境科學，包括：地球科學、氣象學、自然資源管理與維護、環境污染預防、生態學、社會與人文環境管理、環境政策與規劃、及永續發展等之實務經驗。

#### Practical Training of Environmental Science

3 E

The objective of this course is to provide enrolled students with details regarding earth science, meteorology, natural resource management and maintenance, environmental pollution prevention, ecology, social and human environment management, environmental policy and planning, and sustainable development and to gain practical experiences in these fields

#### 環工單元操作與實驗

3 選

本課程內容將包含以下環境工程上重要之單元操作程序: 1.活性污泥程序 2.沉澱 3.厭氣消化反應動力學 4.混凝 5.活性碳吸附 6.空氣除塵(袋式集塵器)7.空氣除酸(填充滌氣塔)8.煙道氣體量測。課程設計為課堂單元操作原理講授每週兩小時與實驗操作每週三小時。

## Unit Operations of Environmental Engineering 3 E

This course covers the important and most often used unit operations or processes in environmental engineering. The following unit operations will be studied: 1.activated sludge process; 2.sedimentation or settling;3.anaerobic digestion chemical reaction kinetics; 4.flocculation and coagulation; 5.activated carbon adsorption; 6.particulate removal (baghouse); 7.acid gas scrubbing (packed tower scrubber); flue gas measurement. The course is divided into two parts: a two-hour lecture which introduces the principles of unit operations and a three-hour experiment every week

(二)水土保持系：

校內實習 3 選

本課程的主要目的，在使學生經由參與水土保持科技服務中心的產學實作，瞭解目前業界的工作重點與職能需求，以利學生趁早規劃未來課程的選修與職涯路徑。。

## Practical Training 3 E

The objective of this course is to help students understand the needs and key points of professional sectors through practical training. The expected outcome of this course is to assist students in preparation of courses selection and professional career.

(三)車輛工程系：

產業問題解析與對策 3 選 蔡建雄、張明彥 下

此課程為一個問題導向學習的課程，目的在啟發學生開始自我學習的動機，並進行產業問題的跨領域知識建構與整合。本課程將以真實的產業問題來引發學生討論，透過老師教案的設計與進行問題的引導，培養學生解構問題的思考、討論、學理機制的學習與對策問題的能力。

## Analysis and Countermeasures of Industrial Problems 3 E C.H. Tsai, M.Y. Chang S

This course is a problem-oriented learning course, which aims to inspire students' motivation to start self-learning, and to construct and integrate multi-disciplinary knowledge of industrial problems. This course will use real industry problems to trigger students' discussion. Through the design of teacher's teaching plans and the analysis of problems, students will be trained to deconstruct industrial problems, think about, discuss, and learn about its mechanisms and countermeasures.

(四)生物機電工程系：

計算流體力學 3 選 苗志銘 下

計算流體力學(Computational Fluid Dynamics, CFD)是藉由電腦來模擬流體運動過程的一門學問。CFD 的應用範圍非常廣泛，如航太、汽車、船舶、土木、機械、化工、醫工、電子、材料、大氣與海洋等均涵蓋在內。

本課程的教學內容：明確計算流體力學的用途、掌握流體力學的控制方程、熟悉計算流體力學的數值方法。透過本課程的學習，幫助學生掌握典型的計算流體力學數值方法、以及目前計算流體力學的現況和發展趨勢，並解決生活或工程設計中所遇到的流體問題。本課程之主要內容綱要：一、工程問題解決方式 二、物理數學模式之建立 三、數值方法運用四、工業應用案例探討。

**Computational Fluid Dynamics****3 E****J. M. Miao S**

Introduction to computational fluid dynamics (CFD):

This course is aimed to provide a systemic study to application of CFD, including the review of engineering methods, introduction of CFD method, simulation with numerical methods and analysis of floefield. The subject contents are:

1. Introduction to method for solving the engineer questions.
2. Mathematical equations to present the physical models.
3. Application of numerical methods.
4. Engineering samples with CFD method

**農業機械特論****3 選****陳韋誠****下**

本課程主要針對國內外之農業機械進行探討，農機設計係為了達成特定目的而規劃或創新之一門設計藝術。通常機械是由許多不同的元件所構成，各元件必須經過正確設計，而後將其組成一整件。在規劃初步，對於質量較大之構件，因加速度而產生之慣性力，應考慮其振動及均恆之效應。此外，亦需研究製造、銷售、安裝及維護等經濟因素，使在合理壽命內維持正常功能與效率。

**Special Topics of Agricultural Machinery****3 E****Wei-Cheng Chen****S**

This course mainly focuses on the discussion of domestic and foreign agricultural machinery. The design of agricultural machinery is the art of planning or devising new machines to accomplish specific purpose. In general, a machine will consist of a combination of several different elements properly designed and arranged to work together, as a whole. During the initial planning of an agricultural machinery, fundamental decisions must be made concerning types of kinematic chain to be used, and correct utilization of analysis and synthesis of mechanism. Then investigate the vibrations and blance due to inertia effects. Economic considertions are usually of prime importance, such as manufacture, sale, installation and maintenance for a reasonabe life and efficiency..

**高等生物產品加工工程****3 選****陳韋誠****下**

生物產品加工工程乃是藉助工程原理與方法，將生物產品給予適當處理的科技，其目的為維護級提升產品品質與經濟價值，加工方法因產品種類及需要性而異，本課程針對常見之生物產品加工工程技術，於工程分析與應用方面分別加以講解，主要包含物料細碎與造粒、物料混合與攪拌、選別與除雜、物料輸送、乾燥、產品之凍結、冷藏與貯藏等，有助於瞭解加工之問題及方法，以減少直接或間接損失及增加其經濟價值。

**Advanced Biological Product Processing Engineering****3 E****Wei-Cheng Chen S**

This course mainly focuses on a technology that uses engineering principles and methods to properly process biological products. Its purpose is to maintain product quality and economic value. Processing methods vary according to product types and needs. This course is aimed at common biological products. Product processing engineering technology is explained separately in terms of engineering analysis and application, mainly including material crushing and granulation, mixing and stirring, sorting and impurity removal, transportation, drying, freezing, refrigeration and storage, etc., which is helpful to understand the problems and methods of processing to reduce direct or indirect losses and increase its final values.

**醫學影像與訊號處理****3 選****蔡循恒****下**

本課程主要教授學生醫學影像與醫學訊號的相關工程分析技術，課程中學生將學習醫學影像的辨識與影像處理技巧，以及生物訊號量測方法與資料擷取的處理。



**Medical imaging and signal processing****3 E****H. H. Tsai, F**

This course mainly teaches students the related engineering analysis techniques of medical images and medical signals. In the course, students will learn medical image recognition and image processing skills, as well as biological signal measurement methods and data acquisition processing.

**生物產業機械與實習(3)****3 選**

本課程是以生物本身或其個別要素為對象，分別介紹其生產相關之機械，主要著重於機械原理、構造、應用與生物的關係，生物產業機械其內容包括生物產業機械概論、生物產業機械作業與成本分析、能源相關機械、細胞、組織相關機械、播種、移植、收穫、調製機具、畜產、水產、營養、藥劑相關機械。實習內容包括農具(犁、耙、碎土機具)的認識，搭配曳引機，進行耕耘、整地，並透過推土機、裝載機、挖掘機、卡車---等土方機具之實作實習，使學生了解平地、坡地、土壤耕耘的方式與機具之應用。

**Biological Industry's Machinery and Practice(1)****3 E**

The main purpose of this course is to introduce biological industry related machinery including the theory, structure, and applications. The contents as follows: introduction, operation and cost analysis, energy related machine, cell, organ, machine, seeding, transplant, harvest, livestock and fish, nutrition, pesticide, related machine. The practice of this lab include the acknowledge of tool and accompany with the tractor. Students will learn the skill of land operation by digging machine, loading machine experiments..

**(五)先進材料學士學位學程：****材料製程檢測實習****3 選****合授、上**

本課程規劃讓學生於校內進行產學案、研究中心或檢測中心實務實習，可有效提升學生對材料科學與工程實務之認識，以及其在材料製程與檢測上的應用。本課程期使學生掌握最新之材料科技與產品應用發展趨勢，強化學生實作能力，協助學生提早瞭解產業運作，結合理論與實務，培養正確工作態度，以及提升就業競爭性。。

**On-Campus Field Practice****3 E****Joint teaching、F**

This course allows students to conduct practical training on campus, which can effectively enhance their understanding of practical techniques in the material science and engineering fields. This course aims to enable students to: master the cutting edge material technology and related product application development trends, strengthen their practical ability, experience the operation of industry for the combination of theory knowledge and practical techniques, develop their positive work attitude, as well as to enhance their competitive employability.

### 三、 管理學院

#### (一)企業管理系：

##### 企業溝通

3 選

陳先郡

如何進行有效溝通，無疑地，是現今工作場所中最被重視的議題之一，而個人在工作領域的成敗也往往取決於其與他人(例如，主管、同事、部屬、顧客與廠商)溝通的能力。本課程將介紹與溝通有關的理論與概念、溝通的技巧與方式。透過課堂講授、課堂討論、小組活動，以及課程作業等設計，培育學生們商業書寫能力、人際與團隊溝通能力、有效運用資訊科技於企業溝通之能力，以及國際與跨文化溝通的分析能力等，以期使同學們未來能於職場上進行有效的溝通。

##### Business Communication

3 E

H.C. Chen

How to communicate effectively is undoubtedly one of the most important issues in the workplace today, and much of an individual's future success in business depends on his/her ability to communication with others (such as supervisors, co-workers, subordinates, customers, and suppliers). This course introduces the principles, elements, and practices of effective communication. Students are going to develop their written business communication skills, interpersonal and group communication skills, the uses of technology in business communication, analytical skills in international and cross-cultural business communication through textbook readings, group discussions and activities, and course assignments.

##### 績效管理

3 選

陳先郡

績效管理已被視為是組織達成目標不可或缺的重要管理功能之一。然而由於其複雜性與多面性，少有組織能有效地執行績效管理。本課程的目的即為協助學生了解績效管理的重要性以及獲取能有效設計與執行績效管理系統的知識與能力。本課程內容涵蓋與績效管理相關的現今研究發現以及最新的實務應用，主要議題包含績效管理的策略考量、績效管理系統地執行、員工與領導發展議題、績效管理與獎酬系統、法律與團隊之關係的議題。期待透過本課程能使學生無論在概念上與實務上對於績效管理都能有較清楚的認識，以期未來能在職場上有效的加以應用所學

##### Performance Management

3 E

H.C. Chen

Performance management has been recognized as one of the most important management functions of helping organizations to achieving their goals. However, due to its complexity, few organizations implement performance management system in effective ways. The purpose of this course is to help students understand the importance of performance management and obtain the knowledge of designing and implementing effective and successful performance management systems. Both research-based findings and up-to-date practical applications will be introduced. The main topics include strategic consideration of performance management, the details of system implementation, employee and leadership development issues, and the relationship among performance management, rewards, the law, and teams. It is hoped that through this course, students can have a better understanding of performance management, and can effectively apply what they have learned in the future.

##### 人力資源管理專題

3 選

林鈺琴

本課程主要的目的在於介紹有關人力資源管理相關實務。藉由個案學習法，本課程將介紹學生有關實務界在人力資源管理上的做法。使學生獲得人力資源管理之相關知識。內



容包括：人力資源管理導論、招募與遴選、職涯發展、薪酬與福利、人力資源管理之未來發展。

### **Special Topics on Human Resource Management**      3   E      C.C.Lin

This course is focus on the practices of human resource management. Because the importance of this issue, we will introduce this course through case study. The main subjects are summarized as follows: the introduction of human resource management, recruiting and selection, career development, compensation and benefit, the future development of human resource management.

### **(二)資訊管理系：**

#### **網際網路程式設計**      3   選      吳庭育

本課程將藉由程式撰寫教學方式讓學生們學習到網路通訊中 OSI-7 各協定層的功能與關聯，課程中學生將利用 Scket 撰寫主從式架構的網路程式，並開發 TCP/IP 各種連線軟體，最後於期末完成一套網路通訊應用功能的期末專題。

#### **Network Programming**      3   E

This course is designed to use programming to learn OSI-7layers of various protocol layers in network communication. The student will use Scket to construct Client-server model and develop various TCP/IP connection programs. Finally, the final term project will be required to design and implement a network communication application software.

### **(三)工業管理系：**

#### **智慧生產與作業管理實務與應用**      3   選

本課程提供學生智慧生產與作業管理相關基礎知識及模擬實作，培育同學具有智慧製造的知識與實務能力。在課堂教授部分，本課程規劃有智慧生產與作業管理的基本組成知識的傳授，如物聯網、虛實系統、大數據、雲端計算、自動化等基礎知識。在課堂實作部分，本課程將結合精實智慧製造模擬產線與智慧製造執行系統進行智慧生產與作業管理的實務操作實習。

#### **Smart Manufacturing and Operation Management Practice**      3   E

This course will introduce students to basic knowledge and practices in smart manufacturing and operation management. The purpose of this course is to strengthen students' practice capability in smart manufacturing. In the knowledge module, students will learn the basic knowledge of smart manufacturing, including Internet of Things (IoT), Cyber-Physical System (CPS), Big Data, Cloud Computing, Automation. In the practice module, students will put the knowledge learned in the knowledge module into practice by using Lean Smart Manufacturing simulation production line and Smart Manufacturing Executive System (S-MES).

#### **智慧物流專題**      3   選

本課程旨在透過課程講授、相關學術論文研討及專題報告製作與討論的方式，針對整合性生產管理系統之重要領域深入研討，以培養學生熟習各項生產管理的理論與發展趨勢，強化學生未來在生產管理領域之理論研究與實務應用能力。課程研討內容包括：1.新世紀之生產管理發展趨勢。2.價值鏈與生產管理。3.生產策略規劃。4.產能規劃系統。5.物料需求規劃系統。6.製造資源規劃。7.存貨控制模式。8.等候理論在生產管理的應用。9.及時

化生產 / 精簡生產 / 敏捷生產。10.最佳化生產技術。11.生管資訊系統。12.資訊科技與生產管理。

### **Topics for Intelligent Logistics 3 E**

The purpose of this course is to familiarize students in understanding the theories and development of some important areas in the integrated production management system by way of lectures, academic-paper discussions, and special-topic reports. This course contains the following areas: 1.The evolution of production management in new century.2.Value chain and production management.3.Production strategic planning.4.Capacity planning system.5.Material requirements planning system.6.Manufacturing resources planning.7.Inventory control model.8.Queuing theory in production management.9.Just-in-time production / lean production / agile production.10.Optimized production technology.11.Production management information system.12.Information technology and production management.

### **品質工程與實習 3 選**

本課程旨在介紹線上品質管制的基本觀念，因此本課程會介紹損失函數與品質水準，公差設計，線上品質管制與回饋，線上品質參數控制，製程品質改善方法，預防保養的概念

### **Quality Engineering 3 E**

The course is design to introduce the concept of on-line quality control in production systems. Hence, the course will include topics of loss function and quality level, tolerance design, on-line feedback quality control, on-line process parameter control, methods for process improvements, introduction to preventive maintenance..

### **運籌管理與實習 3 選**

培養學生相關物流專業知識。內容包括:物流系統概述、物流顧客服務系統、物流資訊系統、物流運輸系統、存貨管理系統、倉儲系統、物流區位規劃、物流配送系統、揀貨系統、物流整體系統設計。

### **Logistics Management and Practical Class 3 E**

The objective of this course is help students to establish the basic professional knowledge of logistics. It contains: Introduction of logistics、Customers service system、Logistics Information system、Transportation system、Inventory Management system、Warehousing system、Logistics location selection methods、VRP methods、Picking method analysis、Logistics system design.

### **財務管理與實習 3 選**

本課程旨在講授財務管理基本概念，並說明企業資金運用管理、財務規劃與投資決策分析，內容包括：財務管理基本概念、財務分析、規劃與控制、營運資金管理、資金成本、資本預算、資本結構、財務風險與報酬、其他財務管理議題。

### **Financial Management and Practical Class 3 E**

The objective of this course is to give fundamental concepts of managerial finance, and to interpret business capital management, financial planning, and investment decision analysis. The content includes the fundamental concepts of managerial finance, financial analysis, planning, and control, working capital management, cost of capital, capital budgeting, capital structure, financial risk and return, and special

topics in financial management.

#### **(四)財務金融國際學士學位學程**

##### **商事法概要**

**2 選**

本課程教授的目的在于使學生熟悉商事法知識及應用，以配合農企業經營上可能面臨的商事法規。包括：(1)公司法 (2)票據法(3)海商法(4)保險法。

##### **Introduction to the Business Law**

**2 E**

This course is to teach business law, which an agribusiness owner or manager will need to deal with. It includes:1.Company Law; 2.Law of Negotiable Instruments; 3.Marine Commerce Law; 4.Insurance Law.

##### **金融行銷**

**2 選**

本課程將幫助學生了解行銷學基本理論，及行銷實務發展之方向，再導入金融市場中公私部門不同的行銷策略與做法。教學內容力求理論與實務併重，預期學生能運用行銷學各種知識於未來職場專業領域，並將特別強調建立金融專業行銷倫理觀念。

##### **Financial Marketing**

**2 E**

The course provides a main flame for students to understand the meaning of Marketing. The content includes introduction of product、pricing、place and promotion strategy. The teaching goal is to combine theory and practical operation and to emphasize marketing strategy in new environment.

##### **國際企業管理**

**3 選**

本課程主要在教導與探討有關國際企業管理相關的學理與課題，期使選修同學對多國籍企業有更進一步的認識。課程範圍包含國際環境分析、國際策略、國際組織設計，與國際人力資源管理等議題。

##### **International Business Managementne**

**3 E**

The main purpose of this course is discussing and comprehending the related knowledge and issues about International Business Management. The major contents will cover：Diamond Model, International Strategy，Design of International Organization and International Human Resource Management. Through this course, the students will have more clear understanding about the truth of Multinational Corporations(MNCs).

#### **(五)時尚設計與管理系：**

##### **時尚產業整合實務實習**

**2 選**

本課程設計旨在追求時尚產業整合人才培養與市場需求的完美契合，協助學生領悟時尚產業從紡織纖維到流行成衣所有製造過程要義和文化，拓展學生對於時尚產業國際視野，未來產業整合發展以及培養學生對時尚行業的發展及綜合管理技能。

##### **An Integrated Practice and Intership in Fashion Industry**

**2 E**

This course is designed to match the needs of the fashion industry, and help students understand the essentials and culture of fashion business and marketing placements cover a wide variety of

responsibilities depending on different student's background. It will start with the goal to provide students and young professionals interested in this exciting industry, it also seeks any opportunities to work in the world's top fashion hubs, to expand students' international perspective on the fashion industry, and to develop their comprehensive management skills in the fashion industry.

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：

##### 兒童教保實務專題研究

3 選

曾榮祥、楊璧琿

本課程旨在引導學生認識兒童教保產業中常用之實務技巧、實務操作與訓練模式。課程透過相關實務演練，讓同學實際體驗產業界的實務訓練模式，同時輔以實務演練或實習經驗，期待修習者掌握實務技巧之餘，也能反思台灣當前教保產業界實務運作的優缺利弊。

##### Research for Practice of Child Education and Care 3 E

This course aims to guide students to understand the practical skills, practical operation and training modes which are commonly used in educare industry. The course allows students to actually experience the training mode through the exercise. At the same time, it is supplemented with internship experience. It is expected that the students not only can master the practical skills, but also are able to reflect on the pros and cons of the practical operation.

##### 校園與教室情境溝通英語

2 選

李俊逸

本課程著重於在同學如何讓營造接觸英語的環境，並且學習在校園與課堂的情境，使用英語傳達簡單指令，以及其他日常生活上溝通式的聽說讀寫語言能力。

##### Classroom Language and Conversations

2 E

Chun-Yi Lee

This course aims to develop students' skills in creating English learning environment for kids. The students are expected to be competent in language use in various situations and events in classes at campus.

##### (二)休閒運動健康系：

##### 運動醫學概論

2 選

本課程之目的在教導學生建立正確的運動醫學概念。其內容包括健康管理、運動員與疾病、急救措施、運動與藥物、運動障礙、運動與貼紮術．．等。

##### Introduction of Sport Medicine

2 E

The purpose of this course is to introduce the basic concept of sports medicine. The contents include health management, athletics and diseases, first aid, sports and medicine, sports obstacles, sports and wrapping and soon

##### (三)技術及職業教育研究所：

##### 厚數據的新應用

2 選

本課程主要將質性研究運用於工作職場績效的提升。本課程目標為學生能理解質性研究之理念、厚數據之蒐集與分析原則；進而將厚數據之概念應用於實務領域，以求其改善。課程內容包括質性研究基礎理念、厚數據之研究設計、厚數據之分析、厚數據之結果應用、厚數據應用困境與克服。

## **The New Application of Thick Data**

**2 E**

This course focuses on applying qualitative research to the improvement of individuals' workplace and institutional performance. This course aims to help students understand the concepts of qualitative research and the principles of thick data collection and analysis, and then further apply the concept of thick data to improving practical work. The course content includes the basic concepts of qualitative research, the research design of thick data, the analysis of thick data, the application of thick data to work, and the difficulties and overcoming of thick data application.



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)觀賞魚科技及水生動物健康國際學位專班：

#### 高階魚貝類免疫學

3 選

本課程的目的是讓學生了解魚類免疫系統、其與魚類病原體的相互作用及其對刺激和疫苗的反應的最新知識。

#### **Advances in Fish and Shellfish Immunology 3 E**

The aim of this course is to develop updated knowledge among students about the fish immune system, its interaction with fish pathogens and its responses to stimulation and vaccines. Certain crustaceans will also be included. This knowledge will be developed through lectures, group discussion, written assignment submissions, student presentations and through laboratory courses

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：

#### 獸醫昆蟲學

**2 選**

本課程講授直接為害動物健康或可傳播動物疾病的病媒昆蟲與病媒蜱蟎。課程內容主要分三部份，第一部份醫學昆蟲概論介紹昆蟲與病媒昆蟲；第二部份病媒各論介紹蚊、蠅、蠓、蚤、蝨、蜱、蟎等各類主要病媒害蟲；第三部份綜合治理，以牛、豬、雞等主要經濟動物養殖場，與寵物的害蟲發生特性與防治管理。本科目旨在使研究生了解獸醫昆蟲學概念與範疇、病媒害蟲種類、為害方式、以及如何防治管理等。

#### Veterinary Entomology

**2 E**

The course of veterinary entomology teaches the pests and vectors of animals, including insects, ticks, and mites that directly harm animal health or can transmit animal diseases. The course content is mainly divided into three parts. The first part introduces insects and pests/vectors of animals. The second part introduces various major vector pests such as mosquitoes, flies, midges, fleas, lice, ticks, mites, etc. The third part is the comprehensive management of the main economic animal farms such as cattle, pigs, and chickens, and the pest occurrence characteristics and control management of pets. This course aims to enable graduate students to understand the concepts and categories of veterinary entomology, the kinds of vector pests, the ways pests damage animals, and how to control and manage them.

#### 小動物疾病特論

**2 選**

本課程將以討論小動物臨床病例的方式，幫助學生瞭解診斷及治療的過程，以增進臨床醫療之實務經驗。

#### Advanced Small Animal Diseases

**2 E**

The course will discuss the clinical cases of small animals. It will help the students to improve their clinical skills through the discussion of diagnose and treatment..

## 七、達人學院中英文課綱

### 無人載具應用農業實作 3 選 徐子圭

因應農業 4.0 的發展，農耕的生態由傳統人力逐轉變為自動化、無人化、智能化及空間立體化，其中無人載具之應用為一大趨勢，本課程簡介目前智慧農業之發展、無人載具之應用、遙控無人機之操作、GPS 之應用、IoT 物聯網整合；而遙控無人定翼及多旋翼機應用及考照練習亦為課程重點。

### Unmanned Vehicle Application in Agricultural Practices 3 E U. K. Hsu

According to the development of Agriculture 4.0, the ecology of farming has gradually changed from traditional manpower to automation, unmanned, intelligent and spatial three-dimensional. Among them, the application of unmanned vehicles is a major trend. This course introduces the current development of smart agriculture and unmanned vehicles, the application of remote-control vehicle, the operation of remote-control aircraft, GPS application, and the integration of IoT. Moreover, the application of remote-control unmanned fixed-wing and multi-rotor aircraft and license examination exercises are also the focus of the course.

### python 基礎及應用 2 選 謝昇憲

本課程介紹 Python 初學者如何在計算機上設置 Python、Python 變量、Python 註釋、Python 程式中讀寫文件、機器學習。

### Python Basics and Applications 2 E S. H. Hsieh

This course provides an overview for Python beginners, how to set up Python on your computer, Python variables, Python comments, reading, machine learning and writing files in Python.

### 影像處理原理與應用 3 選 謝昇憲

課程主要介紹有關數位影像處理的基本原理及應用技術，同時著重以程式處理影像之基本訓練。課程中將探討數位影像之資料結構、影像變換方法、影像強化及特徵擷取技術等課題，並介紹目前影像處理之開源工具，以及影像處理相關技術的最新進展與應用。

### Principle and Application of Image Processing 3 E S. H. Hsieh

In addition to programming technique, the principle and techniques of digital image processing will be presented in this course. The digital image data structure, transforming methods, image enhancing technique and features extraction are the issues presented in this course. The open source tools for digital image processing and applications in agriculture and biology are introduced as well.

### 程式語言與實習 2 選 謝昇憲

本課程主要透過 C++ 介紹程式設計的概念及其相關指令的語法與程式結構，介紹主題包括整合開發環境介紹、程式設計基本流程、物件導向程式設計等。

### Programming language and internship 2 E S. H. Hsieh

This course uses C++ to demonstrate the programming concept, instruction and algorithm. Topics include introduction of integrate development environment, fundamental process of programming, object-oriented programming, etc....

### 電腦視覺與影像處理 3 選 陳智勇

本課程期待培養學生於影像處理、電腦視覺及深度學習領域技術設計及整合實作的能力，透過務實的作業實例來培育學生具備研發思考、程式設計及解決現存問題的能力，藉由分組計劃的實作來培養學生具備發現問題、解決問題及團隊分工合作的能力與精神，並可把所學的理论基礎應用到工業界、臨床醫學影像處理及精準運動的實務面。

### Computer Vision and Image Processing 3 E C. Y. Chen

This course is expected to cultivate students' abilities in technical design and integrated practice in the fields of image processing, computer vision and deep learning. Through practical work examples, students will be cultivated to have the ability of R&D thinking, programming and solving existing

problems. The practice is to train students to have the ability and spirit of discovering problems, solving problems, and teamwork division and cooperation, and can apply the theoretical foundations they have learned to the practical aspects of industry, clinical medical image processing and precision sports.

### **機電概論 3 選 吳上立**

本課程的目的讓學生熟悉目前業界常用之電控、機械、感測器、控制器等組件，並學習如何使用業界常用之通訊方式來讀取感測器訊號或控制外部零件，讓學生具備機電整合之基本能力。

#### **Introduction to Mechantronics 3 E S. L. Wu**

This course aims to enable students to electronic control, machinery, sensors, controllers and other components commonly used in the industry, and to learn how to read sensor signals or control external parts by using communication methods commonly used in the industry, so that students can have the basic ability of mechanical and electrical integration.

### **工廠作業與實習 3 選 陳智勇**

本課程內容包括工廠安全、量具使用、工具修磨、鉗工、鉚工、油漆工、水管工、電工、混凝土工、板金及展開圖等。配合正課讓學生練習在工廠工作之技能，本課程內容包括工廠安全、量具使用、工具修磨、鉗工、鉚工、油漆工、水管工、電工、混凝土工、板金及展開圖等。

#### **Workshop Operation and Practice 2 E C. Y. Chen**

Course contents include the safety of workshop, the use of measuring tools, tool grinding, bench work, welding, paint work, pipe work, electrical work, concrete work, sheet material work and developing etc. Match up the program training students to learn the skill which they will work in the plant, course contents include the safety of workshop, the use of measuring tools, tool grinding, bench work, welding, paint work, pipe work, electrical work, concrete work, sheet material work and developing etc.

### **生物機電工程概論 2 選 陳智勇**

本課程主要介紹生物機電工程的基本原理、組成、目前研究趨勢與應用範例，介紹主題包括生物技術產業的工程化、農漁牧產業的自動化生產及醫學工程技術等。

#### **Introduction on Biomechatronics Engineering 2 E C. Y. Chen**

This course presents the principle, components, current research and application examples in biomechatronics engineering. Topics consist of engineering in biotechnology industry, automation in agricultural, fishery, and animal productions, and biomedical engineering.

### **基礎數學 3 選 謝昇憲**

本課程包含一學年(二學期)之課程，主要是要讓大家學習如何把數學說清楚、講明白，它除了是所有數學課程必備的基礎訓練，其所傳達的概念也大量地應用於資訊科學領域之 人工智慧、編輯器、程式語言，以及語文學中的邏輯語意學等。

#### **Basic Mathematics 2 E S. H. Hsieh**

This course includes a one-year (two-semester) course. It is mainly for everyone to learn how to speak clearly and understand mathematics. In addition to the basic training necessary for all mathematics courses, the concepts it conveys are also widely used in information science. Fields of artificial intelligence, editors, programming languages, and logical semantics in philology.

## **行銷設計學堂新開課程中英文課綱**

### **人像攝影與影像後製(微型課程) 0.3 選 蔡展維**

- 1.攝影秘訣及拍攝練習
- 2.作品改善檢討暨成果展示

#### **Portrait Photography and Photo Retouching 0.3 E C. W. Tsai**

- 1.Tips for Photography.

2.Final presentation.

**服務設計與顧客旅程(微型課程) 0.3 選 趙雨潔**

- 1.服務設計與顧客體驗
- 2.服務流程與服務創新
- 3.顧客旅程地圖實作

**Service Design and Customer 0.3 E Y. C. Chao**

- 1.Service Design and Customer Experience
- 2.Service Process and Service Innovation
- 3.Customer Journey Maps

**品牌行銷(微型課程) 0.3 選 蔡展維**

- 1.品牌觀念背景介紹
- 2.個案分析
- 3.品牌行銷

**Brand Marketing 0.3 E C. W. Tsai**

- 1.Basics of Brand Marketing.
- 2.Case Analysis
- 3.Brand Marketing

**消費者心理學(微型課程) 0.3 選 陳佳誼**

- 1.消費者心理與行銷
- 2.消費者知覺
- 3.消費者動機
- 4.消費者決策
- 5.自我概念與消費行為
- 6.群體影響及意見領袖

**Consumer Psychology 0.3 E C. Y. Chen**

- 1.Consumer Psychology and Marketing
- 2.Consumer Perception
- 3.Consumer Motivation
- 4.Consumer Decision Making
- 5.Self-Concept and Consumer Behavior
- 6.Group Influence and Opinion Leader

**商業攝影(微型課程) 0.6 選 蔡展維**

- 1.商業攝影基礎
- 2.商業攝影-市場需求與自我行銷重點
- 3.整合運用
- 4.作品改善檢討暨成果展示

**Commercial Photography 0.6 E C. W. Tsai**

- 1.Basics of Commercial Photography.
- 2.Commercial Photography
- 3.Integrated Application.
- 4.Final Presentation.

**會展行銷與口語表達(微型課程) 0.6 選 蔡展維**

- 1.認識會展產業
- 2.會展整合行銷實務規劃
- 3.如何開場、開始演講的方法

- 4.口語表達技巧及自信
- 5.說故事的技巧搭配肢體語言

**MICE Marketing & Oral Expression    0.6    E    C. W. Tsai**

- 1.MICE Industry Trends
- 2.MICE Media Marketing
- 3.The Method of Opening and Begin A Lecture.
- 4.To enhance students' presentation skills with higher confidence.
- 5.To make a story come alive by using eye contact, posture, gestures and voice effectively

**廣告文案撰寫(微型課程)    0.6    選    蔡展維**

- 1.行銷策略與品牌文案
- 2.文案寫作基礎
- 3.作品改善檢討

**Copywriting    0.6    E    C. W. Tsai**

- 1.Marketing Strategy and Brand Copywriting.
- 2.Basics of Copywriting.
- 3.Final presentation.

**影像後製與合成特效(微型課程)    0.6    選    蔡展維**

- 1.Lightroom 與 Photoshop 修圖秘技
- 2.進階人像精緻修圖
- 3.排版與設計
- 4.作品改善檢討暨成果展示

**Image Post-production and Composite Effects    0.6    E    C. W. Tsai**

- 1.Tips for Lightroom and Photoshop.
- 2.Portrait Editing.
- 3.Typesetting and Design.
- 4.Final Presentation.

**職能培力學堂新開課程中英文課綱**

**心智圖學習法-激發你的創造力(微型課程)    0.6    選    陳秀足**

- 1.探索案例中的智慧
- 2.用心智圖學創新思維：提問的五個技巧
- 3.用心智圖提升敏銳度三招
- 4.心智圖的基本概念：圖像式思考介紹
- 5.心智圖的技法：大綱、分支、關鍵字
- 6.心智圖的用法：輸入、整理、輸出
- 7.心智圖的祕法：具體與抽象、歸納與推演、格式化輸出
- 8.心智圖的復習系統

**Mind Map Learning Method - Stimulate Your Creativity**

**0.6    E    H. T. Chen**

- 1.Explore the wisdom in the case
- 2.Use mind mapping to learn innovative thinking: five tips for asking questions.
- 3.Three ways to improve acuity with mind map
- 4.The basic concepts of mind mapping: an introduction to visual thinking
- 5.Mind map techniques: outline, branches, keywords
- 6.The usage of mind map: input, sorting, output
- 7.The secret method of mind map: concrete and abstract, induction and deduction, formatted output
- 8.Mind map review system



**DNA 身心靈療育與情緒創造實務(微型課程) 0.6 選 陳秀足**

- 1.DNA 身心靈療育啟航
- 2.情緒創造與紓壓模式
- 3.DNA 正念治療與實務運用
- 4.靈性療育取向與關係藝術

**DNA body-mind-spirit healing and emotion creation practical course**

**0.6 E H. T. Chen**

- 1.The beginning of DNA body-mind-spirit healing
- 2.Emotion creation and stress relaxation
- 3.DNA Mindfulness-based cognitive therapy and practical application
- 4.Spiritual healing approach and art of relationships

**職涯探索暨個人數位品牌設計(微型課程) 0.6 選 陳秀足**

- 1.職涯管理與探索
- 2.設計個人職涯探索報告書
- 3.個人數位品牌與管理風格
- 4.天賦特質的團隊經營手冊

**Career exploration and personal digital brand design 0.6 E H. T. Chen**

- 1.Career management and exploration
- 2.Design personal career exploration report
- 3.Personal digital brand and management style
- 4.Write a team management manual depending on the talent traits of team members

**提高人生勝率的談判術(微型課程) 0.6 選 陳秀足**

- 1.談判造勢的知覺開發
- 2.判斷情勢的談判籌碼
- 3.談判取勝的關鍵技巧
- 4.催眠式的精準談判

**Reach a successful life by negotiation 0.6 E H. T. Chen**

- 1.Creating negotiation situations and perception development
- 2.Judge the situation and use bargaining chip
- 3.Negotiate to win : essential skills
- 4.Hypnotic precise negotiation

**創新創業學堂新開課程中英文課綱**

**創客基礎能力培訓(1)(微型課程) 0.6 選 鍾智超**

- 1.Inkscape 軟體教學
- 2.Tinkercad 繪圖教學
- 3.3D 列印擠製成型教學與實作
- 4.雷射雕刻教學與實作

**Maker Basic Ability Training 0.6 E C. C. Chung**

- 1.Inkscape software teaching
- 2.Tinkercad drawing teaching
- 3.3D printing and extrusion teaching and practice
- 4.Laser carving and cutting teaching and practice

**3D 掃描與逆向工程實作(微型課程) 1 選 蕭凱元**

以 3D 掃描設備擷取數位資料，透過 Fusion360 3D 繪圖建模軟體編輯 STL 資料格式，達成實體擷取複製設計，及衍生變更設計的逆向工程能力培養。

**Practice of 3D Scanning Technology and Reverse Engineering**

### **1 E K. Y. Hsiao**

Obtain digital data with 3D scanning equipment, edit 3D STL files in drawing software and use Fusion360. In this, learn digital data acquisition, copy objects, and change object design. Finally, realize the training of reverse engineering technology.

### **3D 列印概論 2 選 楊膳銘**

- 1.3D 列印技術原理與發展近況
- 2.美國材料試驗協會 (ASTM) 7 大 3D 列印技術
- 3.3D 列印機介紹與切片技術
- 4.3D 列印材料介紹與應用
- 5.3D 列印 VP 與 ME 成品特性
- 6.經濟部工業局 IPAS 3D 列印工程師職能認證與範例

### **Introduction of 3D Printing Technology 2 E S. M. Yang**

1. Principles and Development of 3D Printing Technology
2. American Society for Testing and Materials (ASTM) and 7 types of 3D printing technology
3. 3D printer and slicing technology
4. Introduction and application of 3D printing materials
5. VP and ME finished product characteristics
6. Introduction to the IPAS 3D Printing Engineer Certification Exam

### **3D 建模設計 2 選 楊膳銘**

- 1.3D/2D 電腦輔助繪圖軟體之應用與現況
- 2.工程圖學與識圖
- 3.Onshape 雲端 3D 工程繪圖軟體介紹與註冊
- 4.3D 協同設計與基礎特徵指令
- 5.3D 零件與組合併
- 6.3D/2D 轉檔與輸出
- 7.3D 切片與 3D 列印

### **Practice of 3D Modeling 2 E S. M. Yang**

1. 3D/2D Application and current situation of computer-aided drawing software
2. Engineering Graphics
3. Introduction and registration of Onshape cloud 3D engineering drawing software
4. 3D collaborative design and basic feature instructions
5. 3D part and assembly
6. 3D/2D Conversion and output
7. 3D slicing and printing

## **產業增能學堂新開課程中英文課綱**

### **MOS 漢堡店經理人才培訓實務研習(2) (微型課程) 1 選 程宛琳**

將課程帶入摩斯漢堡的經營理念，融入企業文化，學習基本理念，體驗基礎的操作工作及營運管理，使學生結合顧客關係管理、食品衛生與安全、食品法規、安全管控技術以及風險評估等專業知識應用於實務，提升教育與產業連結，培育連鎖餐飲業在營運實務之人才。

### **MOS Manager Talent Training Practice (2) 1 E W. L. Cheng**

Students will be able to apply their professional knowledge in customer relationship management, food hygiene and safety, food regulations, safety control techniques, and risk assessment, etc., to enhance the connection between education and industry, and cultivate talents in the operation of restaurant chains.

### **漢堡科技達人(微型課程) 1 選 張慧珍、趙偉廷、蔡宏儒**

本課程由餐飲連鎖經營介紹、產業趨勢及品牌經營，烘焙與西餐技術等教授學生透過品牌經營與系統化及創新的管理。另一方面介紹同學認識新科技與在地食材的體驗為安心餐飲帶來未來發展的更多樣貌與可能

性。

### **Hamburg New Technology 1 E H. C. Chang, W. T. Chao, H. J. Tsai**

This course aims to help students in building knowledge in the fields of Chain restaurant industry, industrial trends and brand management, baking and Western food technology, such as teaching students through brand management and systematic and innovative management.

On the other hand, introduce students to understand new technologies such as: 3D food printers, drone delivery services and local ingredients.

### **健身產業經營策略及趨勢展望(微型課程) 0.3 選 蘇蕙芬**

分享該如何進入健身產業並成為一名專業的運動教練，讓自己在眾多健身教練當中突破重圍，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。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。

### **Business strategy and trend outlook for the fitness industry 0.3 E H. F. Su**

Main content of this course: 1. This course share how to use gym marketing strategies to break through the barriers of many Sports coach, to successfully develop new customers while also retaining the key skills of regular customers, with case studies and rich course content to stimulate students' creativity. 2. Analyze the future development trends and key success factors of existing gym operations in a simple and easy-to-understand way, so that students can understand them.

## **永續發展學堂新開課程中英文課綱**

### **噴砂玻璃藝術(微型課程) 0.3 選 曹龍泉**

噴砂玻璃課是一門親自動手教學的課程，並由專業級教授現場教授及指導，從設計到製作學習玻璃噴砂基礎技術。 您將收到關於一系列主題的個性化指導，從製作自己的光罩、製作 及成品。

### **Sandblasting glass art 0.3 E L. C. Tsao**

The course of sandblasting glass is a hands-on class taught by top industry professional leaders, designed to coach you in basic to sandblasting techniques. You will receive personalized instruction on a range of topics, from producing your own photomask working & Finished product.

### **原鄉林下經濟六級化產業(微型課程) 1 選 陳美惠**

- 1.認識里山倡議精神
- 2.認識生態旅遊與林下經濟雙策略
- 3.認識霧台林下六級化產業發展

### **The Under-forest Economy Six-grade Industry of Aboriginal Regions**

#### **1 E M. H. Chen**

- 1.To know the spirit of Satoyama Initiative.
- 2.To know dual strategy of ecotourism and under-forest economy.
- 3.To know six-grade industry development of under-forest economy in Wutai township, Pingtung.

### **部落生態與文化導覽實務(微型課程) 0.5 選 姜宜君**

- 1.佳平部落生態環境及歷史
- 2.文化調查及盤點
- 3.青年會與文化復振
- 4.部落導覽實務及演練

### **Tribal ecology and cultural tour-guide practice 0.5 E I. C. Chiang**

- 1.The ecological environment and history of Kaviyangan
- 2.Cultural survey and inventory
- 3.The Youth Club and Cultural Rejuvenation
- 4.Tribal Tour-guide practice and test

### **排灣石板屋建築踏查(微型課程) 0.5 選 姜宜君**

- 1.排灣建築文化與知識
- 2.實地踏查傳統聚落群及建材採集地
- 3.排灣在地資源環境與建築
- 3.石板屋建築工法與實作體驗

**Field study on Paiwan stone slab houses    0.5    E    I. C. Chiang**

- 1.Paiwan Architectural Culture and Knowledge
- 2.On-site inspections of traditional tribe houses and building materials
- 3.Introduction on Paiwan local resources and architectures
- 4.Stone slate house construction and practice

**動物福利學(微型課程)    0.5    選    林昇全**

本課程之目的在使學生能深刻瞭解動物福利，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。"

**Animal Welfare    0.5    E    S. C. Lin**

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.

**犬隻服從訓練與實習    0.5    選    羅書姍**

服從訓練為維持人犬間良好關係理想方式之一，更是行為矯正最基本的方法，主要從狗對人及狗對其他動物的社會化入門，相處時建立、增加彼此溝通之默契，針對坐下、趴下、過來、坐下等待、趴下等待、定點休息和跟著走等項目進行訓練，讓狗能依主人口令做出正確的動作；這門課程對喜歡狗或是有養狗的同學將是非常實用，對各項工作犬專業訓練也是重要基礎。

**Dog obedience    0.5    E    S. S. Luo**

Obedience training is an ideal way to build up good relationship between human and dogs. By doing this properly, it provides important foundation of any training programs. This training covers basic commands such as "sit", "down", "come", "sit and wait", "down and wait" and "heel", and requires dogs to fully understand and follow these commands. The course will gradually develop from on leash training, and will also introduce different training equipment. This is very practical class for those students who love or own dogs themselves, and is very important basic of professional working dog trainings.

**協助犬訓練技術與實習    0.5    選    羅書姍**

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

**Assistance dog training    0.5    E    S. S. Luo**

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

傳閱附件 2----機械工程系追認「110 學年度技優領航專班」課程規劃

## 四年制技優領航專班 機械工程系

### (一)教育目標

- 1.應用機械專業知識，解決精密機械與綠能工程問題之能力。
- 2.具工作熱忱、社會責任感與守法之人文素養。
- 3.培養國際觀、終身學習與團隊合作之能力。

### (二)校定共同必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
通識課程 General Education	12	2	2	2	2	2	2			通識課程中法學緒論、行政法、法律與生活及勞工法規四者至少需選修一門。 通識選項課程： 人文學科：2 門 社會科學：3 門 自然與生命科學：1 門
國文 Chinese	4	2	2							國文(閱讀與寫作)(1) 國文(閱讀與寫作)(2)
大一英文 Freshman English	4	2	2							大一英文(1) 大一英文(2)
英語聽講練習 101~102 English Listening & Speaking Practice	2	1	1							英語聽講練習 101 英語聽講練習 102
憲法 Constitution	2				2					
體育 Physical Education	4	1	1	1	1					一年級： 大一體育(1)、 大一體育(2) 二年級： 體育選項(需修讀不同興趣體育課程)
通識教育講座 Lectures on General Education	1				1					各系依序開課，開課學期不定
外語實務 Foreign Language Proficiency Test	0	0								畢業前修畢 通過標準依「外語實務課程實施要點」規定
合 計	29	8	8	3	6	2	2	0	0	

## (三) 學院共同必修科目

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



## (四)專業必修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
基礎數學 Fundamental mathematics	3	3								
工廠實習 Practical Training in Factory	1	1								
電腦輔助機械製圖 Computer-Aided Mechanical Drawing	3	3								
應用力學 Statics	3		3							
程式設計與實習 Program language and practice	3		3							
工程數學 (1) Engineering Mathematics (1)	2			2						
應用電子學與實習 Practice of Application Electronics	3			3						
材料力學 Mechanics of Materials	3			3						
工程材料 Materials of Engineering	3			3						
材料實驗 Fundamental Experiments in Materials	1			1						
機械製造 Manufacturing Processes and Systems	3				3					
自動控制與實習 Automatic Control and Lab	3				3					
電腦輔助機械設計與實習 (1) Computer Aided Mechanism Design and Practice (1)	3				3					
精密量測與實習 Precision measurement and Practice	2				2					
電腦輔助熱學工程概論與實習 Computer Aided Thermal Engineering and Practice	3				3					
電腦輔助機械設計與實習 (2) Computer Aided Mechanism Design and Practice (2)	3					3				

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
電腦輔助流體力學與實習 Computer Aided Fluid Mechanics and Practice	3					3				
校外實習 Off-campus Internship	9							9		
合 計	54	7	6	12	14	6	0	9	0	

## (五)專業選修科目

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
工程圖學與實習 Engineering Graphics and Practice	2		2							
進階工廠實習 Advanced Practical Training in Factory	1		1							
文獻選讀與寫作 Literature	2			2						
電腦數值控制工具機與實習 Practice of Computer Numerically Controlled Machine Tools	3			3						
能源概論 Introduction to Energy	3				3					
自動化工程 Automation Engineering	3				3					
進階電腦數值控制工具機與 實習 Advanced Computer Numerical Controlled Machine Tools Practice	3				3					
多軸複合加工技術與實習(1) Multi-axis CNC machining technology and practicing	3					3				
夾治具設計與製造實習 Fixture-Jig Design and Manufacture Practices	3					3				
可程式控制與實習 Programmable Logic Controller and Practices	3					3				
電腦輔助機械振動分析與實 習 Computer Aided Mechanical Structural Analysis	3					3				
工廠管理 Factory Management	3						3			
機械人與機械視覺 Machine Vision Technology and Application	3						3			
多軸複合加工技術與實習(2) Multi-Axis CNC Machining Technology and Practice (2)	3						3			
機電整合與實習 Mechatronics and Lab	3						3			

中 英 文 科 目 名 稱	學 分 數	第一學年		第二學年		第三學年		第四學年		備 註
		上	下	上	下	上	下	上	下	
人工智慧在機器人手臂應用 Artificial Intelligence Application in Robotic Arm	3						3			
人工智慧在機器人手臂應用 實習 Artificial Intelligence Application in Robotic Arm and Practice	1						1			
進階校外實習 Off-campus Internship	9								9	
合計	54	0	3	5	9	12	16	0	9	

## 機械工程系(技優領航專班)

### Department of Mechanical Engineering

#### 一、必修科目 Required Courses

##### 322001 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。

##### 322001 Fundamental Mathematics 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 forms.

##### 322002 工廠實習

1 必

黃惟泰、上

本課程內容包含工廠使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。

##### 322002 Machine Shop Practice

1 R

Wei-Tai Huang, F

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

##### 322003 電腦輔助機械製圖

3 必

待聘、上

本課程之目的在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。

##### 322003 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 software. Students are trained to be acquainted with the mechanical drawing and the projection method to complete mechanical drawing with AutoCAD and SolidWork. This course trains students to understand the concept and technique of CAD and possess the skill of practical application on CAD.

##### 322005 應用力學

3 必

待聘、下

本課程之目的是介紹學生基本的力學觀念及原則，包括：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 Applied Statics

3 R

The purpose of this course is to introduce students with fundamental concepts and principles of mechanics, which includes: statics of particles, equivalent systems of forces for rigid bodies, equilibrium of rigid bodies, distributed forces, and analysis of structures.

##### 322006 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。

### **322006 Program Language and Practice 3 R Chen,Yung-Hsiang , S**

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

### **322007 工程數學(1) 2 必 待聘、上**

本課程介紹：一階常微分方程式、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。

### **322007 Engineering Mathematics(1) 2 R**

Linear ordinary differential equations, Laplace transform, and series solutions are discussed in this course. Fields of vectors and linear algebra are also touched. Students will learn about vectors, matrices, linear systems of equations, determinants, eigenvalues and eigenvectors after finishing this course.

### **322008 應用電子學與實習 3 必 陳念慈、上**

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。

1.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

### **322008 Applied Electronics and Practice 3 R Nyen-Ts Chen , F**

Informative and theoretical explanation in simple terms with detailed examples, suitable for control, refrigeration, air conditioning, electrical repair, and other related fields of application circuits will be introduced in this course. Each chapter has practice after learning in order to strengthen and understand students' learning effects. The informative, easy to understand and detailed theoretical description of examples enhance students' willingness to learn. The teacher will do <1>explain briefly the class of content and things to learn. <2>explain examples with detailed description, analysis, lectures and demonstrations so that students can do self-simulation exercise. <3> give after-school quiz to students to know the student learning conditions.

### **322009 材料力學 3 必 待聘、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，非等載面構件，不連續函數，剪力中心和非彈性彎曲。



**322009 Mechanics of Materials 3 R 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.

**322010 工程材料 3 必 趙志輝、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、聚合材料、陶瓷材料、複合材料、磁料、電性材料使用與選擇。

**322010 Materials Science and Engineering 3 R Chau,Chih-Yeh,F**

The topics introduced in this course include: introduction, atomic structure and bonding, crystal structures and imperfections, phase diagrams, mechanical and electrical properties, polymers, engineering alloy, ceramics, composites and magnetic materials, using and selection.

**322012 材料實驗 1 必 待聘、上**

使同學對於陶瓷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。

**322012 Fundamental Experiments in Materials 1 R 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.

**322013 機械製造 3 必 待聘、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。

**322013 Manufacturing Processes and Systems 3 R 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.

**322014 自動控制與實習 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。

**322014 Automatic Control and Lab 3 R Chen, Chin-Shan, S**

This course studies control system analysis and design. It introduces 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.

**322015 電腦輔助機械設計與實習 (1) 3 必 待聘、下**

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。

**322015 Computer Aided Mechanism Design and Practice (1) 3R S**

This course helps students learning about how to apply CAD and CAE softwares on mechanism design and the design skill of mechanism and machine element. Students can learn 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 session, focusing on the design and analysis of the simple mechanisms by using the CAD and CAE softwares, and interpretation of the results.

**322016 精密量測與實習 2 必 待聘、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。

**322016 Precision measurement and Practice 2R S**

To enable students understand different types of equipment or measuring instrument (contact type or contactless type) that can be used to perform the measurement, or to test ideas, and be familiar with the proper operation of various measuring tools and instruments.

**322017 電腦輔助熱學工程概論與實習 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), 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。

**322017 Computer Aided Thermal Engineering and Practice 3 R Chiang, Ting-Lung, F**

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. Contents of this course includes: fundamental concepts, first and second laws of thermodynamics, thermodynamic cycles and heat transfer principles like conduction and convection.

Also included in this course is an introduction of software as ANSYS/FLUENT which helps students using the computer/numerical methods to solve real world heat transfer problem.

**322018 電腦輔助機械設計與實習 (2) 3 必 待聘、下**

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。

**322018 Computer Aided Mechanism Design and Practice (2) 3R S**

This course helps students learning about how to apply CAD and CAE softwares on mechanism design

and the design skill of mechanism and machine element. Students can learn 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 session, focusing on element type selection, size design, and analysis of the strength and life cycle by using the CAD and CAE softwares, and interpretation of the results.

### 322019 電腦輔助流體力學與實習 3 必

姜庭隆、上

流體力學與人類的食、衣、住、行、育、樂息息相關。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。

### 322019 Computer Aided Fluid Mechanics and Practice 3 R

Chiang, Ting-Lung, F

Fluid Mechanics is that discipline within the broad field of applied mechanics concerned with the behavior of liquids and gases at rest or in motion. This course provides fundamental aspects of fluid mechanics such as fluid properties, pressure variations in fluids at rest and in motion, fluid kinematics, mathematic 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 in monitor.

### 322020 校外實習

9 必

張莉毓、上

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。

### 322020 Off-campus Internship 9 R

待聘, F

Through this internship, students can apply their knowledge learned in school to implement in real world companies as well as factories, also cultivate a series of relevant practical working experience.

## 二、選修科目 Elective Courses

### 322021 工程圖學與實習 2 選 待聘、下

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。

### 322021 Engineering Graphics and Practice 2S S

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 familiarizes students with various two- and three-dimensional graphics concepts, drawing skills, and equips students with ability to develop practical applications and communications in drawing.

### 322022 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。

### 322022 Advanced Practical Training in Factory 1S Huang, Wei-Tai, S

The purpose of this course is to let students continue to practice and improve skills used in factory. With this advanced training course, students are enabled more proficiently for precision machining and machine operation. Also added in this course is the relevant skills of precision grinding unit, so that students will be trained more diligent in learning.

### 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 2 S F

This course introduces how to do the searching and reading works of literature, 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., will be taught.

Other related writing subtopics, such as the 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.

### 322026 電腦數值控制工具機與實習 4 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。

### 322026 Computer Numerical Controlled Machines 4R F

The fundamental construct of a computer numerical controlled(CNC) machine tool is introduced. The functions and operations of the control panel, the transfer of the manually or automatically created program, the positioning and fixturing 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, learning the measuring methods, various kinds of precision machined components can be achieved.

### 322028 能源概論 3 選 姜庭隆、下



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

### 322028 Introduction to Energy

3S

Ting-Lung Chiang, S

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      b

### 322029 自動化工程

3 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。

### 322029 Automation Engineering

3 S

Yi-Hong Lin, S

Automation Engineering is a 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 PLC controller technique. The goal of this course is to train students with fundamental disciplines of automation engineering and practical design ability.

### 322030 進階電腦數值控制工具機與實習

3 選

待聘、下

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。

### **322030 Advanced Computer Numerical Controlled Machine Tools Practice 3S S**

In this course, advanced application of using a computer numerical controlled(CNC) machine tool will be introduced. The functions and operations of the control panel, the transfer of the manually or automatically created program, the positioning and fixturing 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, learning the measuring methods, various kinds of precision machined components can be achieved.

### **32041 多軸複合加工技術與實習 (1) 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。

### **32041 Multi-Axis CNC Machining Technology and Practice (1) 3R ,F**

This course mainly provides the principle of turn-mill machining, 5-axis machining, CNC practicing and CNC programming by manual and CAM software. Students can integrate the functions of turning and milling technology and 5-axis machining technology. The content can focus on machining the end faces of a work piece. The application of C axis is applied in drilling holes, reaming, tapping, and contour milling. Moreover, the ability of operating 5-axis CNC controller will be trained. At the beginning in this course, we will create manually G-code CNC programs to simulate the tool-path, then some effective CAD / CAM systems will be taken in order to produce the final NC code for the manufacturing of various mechanical parts.

### **322043 夾治具設計與製造實習 3S 待聘、上**

本課程目的在使學生瞭解夾治具設計製造程序。

- 一、工具機夾治具之簡介。
- 二、瞭解夾治具設計原理。
- 三、瞭解夾治具機構及應用。

### **322043 Fixture-Jig Design and Manufacture Practices 3S 待聘、F**

The purpose of this course is to let students understand principles of the designing and manufacturing processes of fixtures and jigs. The content includes:

1. Introduction the basic principles of fixtures and jigs.
2. Designing and manufacturing processes of fixtures and jigs.
3. Applications of fixtures and jigs.

### **322044 可程式控制與實習 4 選 陳金山、上**

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。

### **322044 Programmable Logic Controller and Practices 4 S Chen, Chin-Shan 3F**

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 temperature and easy-expand. The course includes the following topics : hardware and software of PLC, programming of PLC, maintaining



and installing of PLC.

### 322050 工廠管理

3 選

黃惟泰、下

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。

### 322050 Factory Management

3 S

Wei-Tai Huang, S

The aim of this course is to make students be acquainted with know-how of factory management. The course also introduces students the organization management, factory layout, finished-good moving, products development and quality management. With this background, a course section on quality management is presented. Hopefully, it will be helpful to students who have to learn the essential area of this management know-how. The content includes: fundamentals of factory management, organization management, quality management and product management.

### 322052 電腦輔助工程分析與實習

3 選

王栢村、上

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。

### 322052 Computer Aided Mechanical Engineering Analysis 3 S Bor-Tsuen Wang, F

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.

### 322055 機械人與機械視覺

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。

### 322055 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.

### 322057 多軸複合加工技術與實習 (2)

3 選

待聘、下

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。

### 32057 Multi-Axis CNC Machining Technology and Practice (2) 3R

, F

This course provides advanced knowledge of turn-mill machining, 5-axis machining, CNC practicing and CNC programming by manual and CAM software. Students can integrate the functions of

turning and milling technology and 5-axis machining technology. The content can focus on machining the end faces of a work piece. The application of C axis is applied in drilling holes, reaming, tapping, and contour milling. Moreover, the ability of operating 5-axis CNC controller will be trained. At the beginning in this course, we will create manually G-code CNC programs to simulate the tool-path, then some effective CAD / CAM systems will be taken in order to produce the final NC code for the manufacturing of various mechanical parts.

### 32061 可程式控制與實習

4 選

待聘、上

本課程主旨為介紹使用工業界最常用之可程式控制器，結合感測器、致動器、訊號處理、人機介面等，以控制機構元件以達所要之功能。進而培訓學生取得專業技術證照。

### 32061 Programmable Logic Controller and Lab 4 S

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.

### 32062 機電整合與實習

4 選

待聘、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。

### 32062 Mechatronics and Lab

4 S

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 circuit 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.

### 32072 人工智慧在機器人手臂的應用與實習 4 選

待聘、下

這門課程向學生介紹了人工智慧在機器人手臂的應用之基礎知識表達、解決問題和學習方法。幫助學生獲得在不同環境下是如何運用將人工智慧應用在機器人手臂。修完課程後，學生將具備以下的知識：人工智慧的理論是如何應用在機器人手臂上。

### 32072 Artificial Intelligence Application in Robotic Arm and Practice 4S

S

This course introduces students basic knowledge of presentation, problem solving, and learning methods of artificial intelligence application in robotic arms. It helps students gain about how artificial intelligence applies to robotic arm under a variety of circumstances. Upon completion of this course, students should be able to understand how the artificial intelligence theorems are applied to robotic arm system.

### 32075 進階校外實習

9 選

張莉毓、下

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。

### 32075 Off-campus Internship

9 S

待聘, S

Through this internship, students can apply their knowledge learned in school to implement in real world companies as well as factories, also cultivate a series of relevant practical working experience.

傳閱附件 3-----110 學年度第 1 學期教師申請開授通識課程大綱

## 110 學年度第 1 學期教師申請開授通識課程中英文課程大綱

### 1、2 鋼琴音樂藝術—古典名曲鑑賞

#### The Art of Piano -Classical Music Appreciation

中、英文課程綱要：

##### 課目概述：

藉由系統的指引，欣賞經典鋼琴名曲

學習各國的音樂，文化，與藝術作品，增加國際視野

達到音樂生活化，樂活身心及終生學習

藉由不同知識領域的探索，發展自我專業之創意

含影片欣賞：

阿瑪迪斯/ 想飛的鋼琴少年

(增進音樂素養，啟發築夢與瞭解文化多元性)

This course aims to introduce the most important piano repertoires in the western classical music world. With a systematic guidance, students learn music, cultures, and artistic works from different countries to broaden a global vision. Course relates to our lives, and benefits students' creativity by exploring in various fields of knowledge.

\*Course includes Movie Days:

Amadeus/ Vitus

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### 3. 西洋音樂史入門 Introduction to Western Music

中、英文課程綱要：

##### 課目概述：

聆賞世界名曲，包含歌劇、交響曲、藝術歌曲等

引導學生對西洋音樂歷史脈絡的認識

達到陶冶性情與音樂生活化

學習藝文作品以利自身領域中的靈感上的啟發

影片欣賞：

曲目 DVD 欣賞(歌劇, 交響曲等)/ 電影海上鋼琴師  
(幫助學生更加容易了解不同的曲種)

**Course Description:**

This course aims to introduce the most famous composers and important works in the western classical music history (Music includes symphonies, operas, lieds, etc.). Students may learn historical study of the basic elements, major periods of western music, and repertoires. With exploration of music appreciation, students may find inspiration on their own professional fields.

\*Course includes live-performed DVD appreciation

-Operas and Symphonies/

Movie (The Legend of 1900)

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#### **4. 運輸工程概論 Introduction to Transportation Engineering**

中、英文課程綱要：

隨著人類活動頻繁複雜，逐漸利用各種運輸工具創造時間及空間效益，來達到國家發展及提升人民生活品質。而各種運輸工具在空中、在地面(下)、在水面(下)載運人及貨物的設施，使之能迅速的將物載運抵目的地。本課程主要分為五大部份。第一部分闡述運輸工程概況，於第二部分至第五部分個別說明公路、鐵路、水路、航空等運輸工程細項逐一授課說明。

With the increasing complexity of human activities, various means of transportation are gradually used to create time and space benefits to achieve national development and improve people's quality of life. Various means of transportation are facilities that carry people and goods in the air, on the ground (under), and on the water (under), so that they can quickly carry objects to the destination. This course is mainly divided into five parts. The first part describes the general situation of transportation engineering, and the second to fifth parts explain the details of transportation engineering such as roads, railways, waterways, and aviation.