

97 學年度調整系所規劃 課程之檢索、中英文摘要

中 華 民 國 九 十 七 年 三 月

動物科學與畜產系 Department of Animal Science

課程代號 Course Number	科目名稱(中 文) Course (Chinese)	學分 Credit	科目名稱(英 文) Course (English)	頁次 Page
專業必修科目 Required Courses				
142001	動物解剖生理學	3	Anatomy and Physiology of Animal	
142002	動物解剖生理學實習	1	Laboratory of the Anatomy and Physiology in Animal	
142003	動物舍規劃與自動化	2	Animal House Arrangement and Automation	
142004	牧場實務實習	2	Animal Farm Practice	
142005	生物化學	2	Biochemistry	
142006	生物化學實習	1	Biochemistry Lab.	
142007	動物遺傳學	2	Animal Genetics	
142008	動物遺傳學實習	1	Animal Genetics Lab.	
142009	動物營養學	2	Animal Nutrition	
142010	畜產品加工學	2	Processing of Animal Products	
142011	畜產品原料學	2	Materials of Animal Products	
142012	畜產微生物學	2	Microbiology of Animal Products	
142013	畜產微生物學實習	1	Microbiology of Animal Products Lab.	
142014	豬隻飼養管理	1	Pig Feeding and Management	
142015	豬隻飼養管理實習	1	Practice of Pig Feeding and Management	
142016	家禽飼養管理	1	Poultry Feeding and Management	
142017	家禽飼養管理實習	1	Practice of Poultry Feeding and Management	
142018	乳用家畜飼養管理	1	Dairy Livestock Feeding and Management	
142019	乳用家畜飼養管理實習	1	Practice of Feeding and Management in Dairy Livestock	
142020	動物育種學	2	Animal Breeding	
142021	禽畜保健	4	Livestock Health	
142022	禽畜保健實習	2	Practice of Livestock Health	
142023	經濟動物繁殖學	2	Reproductive of Farm Animal	

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專業選修科目 Elective Courses

142024	有機化學	3	Organic Chemistry	
142025	有機化學實習	1	Organic Chemistry Lab.	
142026	專題研究	1	Projects Research	
142027	學士論文	1	Dissertation	
142028	畜產機械	2	Animal Production Machinery	
142029	畜產機械實習	1	Practice of Animal Production Machinery	
142030	動物內分泌學	2	Animal Endocrinology	
142031	細胞生物學	3	Cell Biology	
142032	分子生物學	3	Molecular Biology	
142033	經濟動物繁殖技術	1	Reproductive Techniques of Farm Animal	
142034	實驗動物飼養管理	2	Laboratory Animal Feeding and Management	
142035	實驗動物飼養管理實習	1	Laboratory Animal Feeding and Management Practice	
142036	動物遺傳工程	2	Animal Genetic Engineering	
142037	動物遺傳工程實習	1	Animal Genetic Engineering Practice	
142038	功能性基因體學	2	Functional Genomics	
142039	生物資訊學概論	2	Essential Bioinformatics	
142040	實驗動物應用學	2	Application of Laboratory Animals	
142041	實驗動物應用學實習	1	Application of Laboratory Animals Practice	
142042	動物基因轉殖	2	Animal Transgenics	
142043	族群遺傳學	2	Introduction to Population Genetics	
142044	數量遺傳學導論	2	Introduction to Quantitative Genetics	
142045	應用生物統計學	2	Applied Biostatistics	
142046	遺傳評估法	2	Introduction to Genetic Evaluation	
142047	台灣畜產種原之永續利用	2	Sustainable Utilization of Taiwan Farm Animal Genetic Resources	
142048	免疫學	3	Immunology	
142049	胚胎學	2	Embryology	
142050	農業政策與法規	2	Agricultural Policy and Laws	
142051	馬學	2	Equine Science	
142052	馬學實習	1	Equine Science Practice	
142053	單胃動物營養與飼料	2	Monogastric Animal Nutrition and Feed	
142054	反芻動物營養與飼料	2	Ruminant Nutrition and Feed	
142055	牧場經營學	2	Livestock Production Management	
142056	飼料製造技術	1	Feed Manufacture Technology	
142057	飼料製造技術實習	1	Feed Manufacture Technology Practice	
142058	飼料配方設計	2	Design of Feed Formulation	
142059	動物行為	2	Animal Behavior	

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專業選修科目 Elective Courses

142060	家畜環境生理學	2	Environmental Physiology of Domestic Animals	
142061	寵物飼養管理	2	Pet Feeding and Management	
142062	肉用草食家畜飼養管理	2	Meat-production Ruminant Farm Animal Feeding and Management	
142063	水禽飼養管理	2	Waterfowl Feeding and Management	
142064	鹿學	2	Deer Science	
142065	動物福利	2	Animal Welfare	
142066	禽畜廢棄物管理	2	Poultry and Livestock Waste Management	
142067	禽畜廢棄物管理實習	1	Poultry and Livestock Waste Management Practices	
142068	安全畜產品生產導論	2	Introduction to Safe Animal Production	
142069	安全畜產品生產技術	2	Techniques of Safe Animal Production	
142070	安全畜產品檢驗與品管	2	Safe Animal Products Analysis and Quality Control	
142071	食品與餐飲法規	2	Law and Regulation of Food and Foodservice Management	
142072	畜產品檢驗與分析	2	Analysis of Animal Products	
142073	畜產品檢驗與分析實習	1	Animal Products Analysis Practice	
142074	肉品加工	2	Processing of Meat Products	
142075	肉品加工實習	1	Meat Products Lab Practice	
142076	乳品加工	2	Processing of Dairy Products	
142077	乳品加工實習	1	Dairy Processing Practice	
142078	蛋品加工	2	Processing of Egg Products	
142079	蛋品加工實習	1	Egg Products Lab Practice	
142080	畜產品在美容之應用	2	Application of Animal Products on Beauty Industry	
142081	畜產企業實務實習	1	Practice of Livestock Enterprises	

動物科學與畜產系

Department of Animal Science

一、必修科目 Required Courses

142001 動物解剖生理學

3 必

劉世華、余祺，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。

142001 Anatomy and physiology of

3 R

S. H. Liu

Animal

C. Yu, S

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

142002 動物解剖生理學實習

1

必

劉世華、余祺，下

本課程將利用標本及實際解剖生物來介紹身體構造，並在實驗室以顯微鏡、檢測試劑及多項小型手術用具，透過實驗操作來進一步了解血液、心臟、循環、呼吸、泌尿及生殖之生理現象。

142002 Laboratory of the Anatomy and

1 R

S. H. Liu

Physiology in Animal

C. Yu, S

Students will learn animal anatomy with specimens and necropsy and will learn physiological function on blood cell, heart function, circulation, respiratory volume and reproductive cycle by microscopy and polygraph instruments.

142003 動物舍規劃與自動化

2 必

夏良宙，上

畜舍策畫與自動化分為基本策畫所需、材料與原理、各論三部份。基本需要是根據家畜之結構環境、社會環境和氣候環境之需要而訂定；其二為材料與原理，包含隔熱、保溫、風扇、牆、各類設備等材料；各論將就豬、牛、羊、雞舍設計上所需條件、欄數、自動化與飼養管理、飼料、餵飼等之配合

加以討論。

142003 Animal House Arrangement and 2 R

L.C. Hsia, F

Automation

Animal house arrangement and automation will be divided into three parts: basic requirements, material and principle, and animal house for varied species. Basic requirement is concerned the following three environments: structure environment, social environment, and climate environment. Material and principle is discussed about the material used in animal house, and how to use the materials, i.e. insulation, heater, ventilation wall, division and etc. The house arrangement of four species of livestock and poultry will be discussed in detail. They are pig, poultry, cattle, goat, and sheep.

142004 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。

142004 Animal Farm Practice

**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.

142005 生物化學

2 必

食科系，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。

142005 Biochemistry

**2 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.

142006 生物化學實習

1 必

食科系，上

本課程主要配合生物化學正課提供學生對於生物化學相關實驗之基本操作。課程內容包括：PH 值之測定法、緩衝溶液之製備、氨基酸之滴定曲線；2. 蛋白質一般反應、氨基酸與蛋白質之定性分析、蛋白質之定量分析；3. 醣類之定性分析與定量分析。

142006 Biochemistry Lab

1 R

**Dept. of Food Science,
F**

This course is to offer students about the basic practice of biochemistry. The contents of the basic practice were to include: determination of pH values, preparation of buffers, titration curve of amino acids; general reactions of proteins, qualitative and quantitative determination of amino acids and proteins; and qualitative and quantitative determination of carbohydrates.

142007 動物遺傳學

2 必

張秀鑾、劉世華，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。

142007 Animal Genetics

2 R

H. L. Chang

S. H. Liu, 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.

142008 動物遺傳學實習

1 必

劉世華，下

本課程旨在指導學生使其具遺傳學原理之基本知識與提供數量遺傳與分

子遺傳相關技術之學習機會。實習課程內容涵蓋卡方檢測、族群遺傳調查、外表型 T 值檢定、遺傳變異率估計、染色體與動物公母鑑別、核型分析、遺傳性狀觀察、動物細胞有絲分裂與減數分裂、DNA 抽取、DNA 純化、基因表現與突變等知識及相關技術之操作。

142008 Animal Genetics Lab.

1 R

S. H. Liu, S

The aims of this practical lab are to provide students with basic knowledge of the principles of genetics and activities in quantitative and molecular genetic related technologies. The predicted activities are chi-square test, t-test for phenotypes, heritability estimation, chromosome and sex identification of animal, karyotype analysis, observation of genetic trait, meiosis and mitosis of animal cells, DNA extraction and purification, gene expression and mutation.

142009 動物營養學

2 必

謝豪晃, 下

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。

142009 Animal Nutrition

2 R

H. H. Hsieh, S

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.

142010 畜產品加工學

2 必

林美貞, 下

本課程介紹畜產品加工利用的方式與種類，使學生對乳、肉、蛋及禽肉與副產物利用有概括認識，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之原料特性、加工原理、以及加工步驟等。

142010 Processing of Animal Products

2 R

M. J. Lin, S

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.

142011 畜產品原料學

2 必

林美貞，上

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。

142011 Materials of Animal Products

2 R

M. J. Lin, 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.

142012 畜產微生物學

2 必

林美貞，下

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

142012 Microbiology of Animal

2 R

M. J. Lin, F

Products

This course includes characteristics and classification of microorganisms, structure of procaryotes, classification and identification of bacteria, structure of eucaryotes, 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.

142013 畜產微生物學實習

1 必

林美貞，下

本實習配合畜產品微生物學之課程，內容包括無菌操作之訓練、微生物

之染色與計數、微生物之培養與分離、環境因子對微生物生長之影響、環境微生物之檢驗、抗生素檢查與發酵產品之製造。

142013 Microbiology of Animal

1 R

M. J. Lin, F

Products Lab.

The objective of this course is to give students a practical training on microbiological operation. It includes sterilization operation, staining and counting of microorganisms, isolation and cultivation of microorganisms, environmental factors, inspection of environmental microorganisms, examination of antibiotics, and manufacture of fermented products.

142014豬隻飼養管理

1 必

夏良宙，上

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。

142014 Pig Feeding and Management

1 R

L.C. Hsia, F

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.

142015豬隻飼養管理實習

1 必

夏良宙，上

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。

142015 Practice of Pig Feeding and

1 R

L. C. Hsia, F

Management

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.

142016 家禽飼養管理

1 必

謝豪晃, 上

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。

142016 Poultry Feeding and

1 R

H. H. Hsieh, F

Management

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.

142017 家禽飼養管理實習

1 必

謝豪晃, 上

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。

142017 Practice of Poultry Feeding and

1 R

H. H. Hsieh, F

Management

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.

142018乳用家畜飼養管理**1 必****沈朋志等，下**

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。

142018 Dairy Livestock Feeding and**1 R****P. C. Shen, *et al.*, F****Management**

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.

142019乳用家畜飼養管理實習**1 必****沈朋志等，下**

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。

142019 Practice of Feeding and**1 R****P. C. Shen *et al.*, F****Management in 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.

142020動物育種學**2 必****張秀鑾，上**

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。

142020 Animal Breeding**2 R****H. L. Chang, F**

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.

142021 禽畜保健**4 必****獸醫系，上下**

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。

142021 Livestock Health**4 R****Dept. of Veterinary,
F, S**

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.

142022 禽畜保健實習**2 必****獸醫系，上下**

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。

142022 Practice of Livestock Health**2 R****Dept. of Veterinary,
F, S**

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 infectious diseases, internal diseases and reproductive disorder. It also teaches students basic and practical surgical techniques.

142023 經濟動物繁殖學**2 必****劉炳燦等，上**

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

142023 Reproductive of Farm Animal 2 R B. T. Liu *et al*, 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 and techniques, students are required to read and discuss the publication in livestock reproduction.

二、選修科目 Selective Courses

142024有機化學 3 選 環工系，下

本課程乃注重於重要之碳化合物（包括烷、醇、醚、有機鹵化物、芳香族化合物、醛、酮、酸、酯及胺）之官能基反應，各類之合成方法，相互間之關係以及其實際之應用。

**142024Organic Chemistry 3 S Dept. of Environmental
Engineering and
Science, S**

A systematic study of the reaction in each functional group in the important classes of carbon compounds (alkane, alcohol, ether, organic halides, aromatic compounds, aldehyde, ketone, carboxylic acids, ester and amine) the methods of the synthesis of each compound, the relationship and it's uses in each compound.

142025有機化學實習 1 選 環工系，下

本課程係為非提供主修有機化學之學生而開設，其促使學生得以熟悉一

般有機化學之實驗技術，並從實驗中增加對教材之瞭解。本實驗除授以物理常之測定外，並依各官能基之不同之化合物逐一實驗：烷、炔、苯、有機鹵化物、醇、醚、酮、羧酸衍生物及胺等，每一實驗之重點是不同之官能基所產生的不同化學反應的試驗。

142025 Organic Chemistry Lab. **1 S Dept. of Environmental Engineering and Science, S**

This course is designed in conjunction with the lecture of organic chemistry for the students that are not major in organic chemistry. It intends to provide students a profound understanding of subject, matter from laboratory work and familiar with basic laboratory technique. In addition to the measurements of physical constants, the course is carried out in a functional approach: alkanes, alkenes, alkynes, benzenes, organic halides, alcohols, ethers, aldehydes, ketones, carboxylic acids and the derivatives of carboxylic acid, amines. Each experiment will emphasize on the common chemical properties ascribed to functional groups.

142026 專題研究 **1 選 全系老師，上**

本課程擬經由報告之收集、研讀與彙整，除令學生從而習得相關之專業知識外，亦期能由之獲得資料之分析、歸納與邏輯思考之能力，並藉由書面報告、口頭發表及討論之歷練，以培養學生之論文撰寫能力及口頭表達能力。

142026 Projects Research **1 S Faculties, F**

The purpose of this course is to give students training on searching information, reviewing references, designing experiment, collecting and analyzing data. The subjects cover modern aspects of animal science and farm operation. Students must give oral presentation and dissertation.

142027 學士論文 **1 選 全系老師，下**

本課程旨在訓練學生對資料蒐集、整理及表達的能力。學生選擇學士論文有關的主題，蒐集文獻、閱讀、整理成摘要，然後提出報告討論。

142027 Dissertation **1 S Faculties, S**

This course is designed to train students the ability in searching literature, organization of material and presentation. Students are required to select a topic in the field of those related to their thesis, search and review literature and draw up a brief. This presentation is scheduled for every student once a semester.

142028 畜產機械 **2 選 生物系統工程系，上**

b

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.

142031細胞生物學

3 選

余祺，下

本課程講授細胞結構、生理與功能、細胞膜運輸、信息傳導、細胞能量轉換、細胞核、細胞週期、基因重組、轉錄、轉譯、基因表現調節等，使學生瞭解細胞的生命現象，奠定學生對動物科學之認知。

142031 Cell Biology

3 S

C. Yu, S

The basic structure, physiology and function of the cell, membrane transport, signal transduction, energy flow in cells, cell cycle, genetic recombination, transcription, translation, gene expression are discussed in this course. It makes the students aware the basic animal science.

142032分子生物學

3 選

余祺、劉世華，上

本課程介紹基因、核酸物質、基因複製的過程，並介紹各種定性、定量技術及基因工程之理論基礎，以符合目前生物技術發展的趨勢，作為生物技術的基礎。

142032 Molecular Biology

3 S

C. Yu,

S. H. Liu, S

This course is going to introduce the basic theories about DNA, RNA, DNA replication, transcription and translation also, the techniques about DNA sequencing and genetic engineering will be introduced in this course. In order to learn more biotechniques, molecular biology is the important basic course to all students who study in life science.

142033經濟動物繁殖技術

1 選

沈朋志、

劉世賢，上

本實習之目的在配合「禽畜繁殖技術」課程進度，使學生藉由人為之控制提高禽畜繁殖效率，並育成合乎人類所需之經濟動物。課程內容設計以禽畜類別為單位，分別探討其繁殖生理特性、繁殖方法與繁殖管理、人為控制之發情與排卵、人工授精、懷孕診斷、分娩控制、胚移植及縮短世代間距之各種方法。

1 S

P. C. Shen,

of Farm Animal

S. S. Liu, F

Objectives of this course are: 1) increasing reproductive efficiency by artificial control, 2) cropping desired economic animal. Class is arranged by animal species. Topics include the characteristics of reproductive physiology and management, artificial control of estrus, ovulation, and insemination, pregnancy diagnosis, control of parturition, reducing calving interval and embryo transfer.

142034 實驗動物飼養管理

2 選

沈朋志等, 上

本課程主要介紹應用於農學及生物醫學之實驗動物的飼養管理及其動物學之基礎特性，以作為研究、治療及實驗之模式系統。課程內容包括實驗動物種類與命名及育種、實驗動物管理標準操作程序；實驗動物飼養環境與設施；實驗動物營養與飼養管理；實驗動物網路資源；實驗動物品質管制；以及實驗動物疾病與人畜共通傳染病等，涵蓋之實驗動物有小鼠、大鼠、倉鼠、天竺鼠、家兔、犬及家畜等，以有助於瞭解實驗動物在農學及生物醫學等領域之科技研發上所扮演之角色與特性。

142034 Laboratory Animal Feeding

2 S

P. C. Shen et al.,

and Management

F

This course provides a concept and introduction to the feeding and management of laboratory animals applied in the research of agriculture and biomedical medicine. It includes the standard operative procedures, environmental control, nutrition and feeding, network resources for laboratory animals, quality control, important zoonosis and health control.

142035實驗動物飼養管理實習

1 選

沈朋志等, 上

本課程主要介紹應用於農學及生物醫學之實驗動物的飼養管理方法及其實務操作，以作為研究、治療及實驗之模式系統。課程內容包括實驗動物之動物識別與記錄；實驗動物國際認證及標準操作程序編寫；實驗動物之大體解剖操作與生理構造；動情週期及配種觀察；實驗動物之保定、採血、注射與麻醉；實驗動物之健康診斷與治療等，涵蓋之實驗動物有小鼠、大鼠、倉鼠、天竺鼠、家兔、犬及家畜等，以有助於學生習得各種實驗動物之飼養管理技術。

142035 Laboratory Animal Feeding

1 S

P. C. Shen et al.,

This practical course emphasizes on the technical training about identification, record, recognizance and SOP of the laboratory animals, gross anatomy and physiological function, reproductive cycles and breeding observation, holding, bleeding, injection and anesthesia, health monitoring and simple practice in disease diagnosis and exclusion.

142036 動物遺傳工程**2 選****沈朋志，下**

動物遺傳工程課程首先介紹動物遺傳基因與 DNA 之構造與功能，其次介紹動物染色體構造與複製，基因連鎖與突變，DNA 複製與重組技術及其應用，基因之突變與重組之遺傳機制，重組 DNA 之表現及遺傳分析技術。

142036 Animal Genetic Engineering**2 S****P. C. Shen, S**

The major goal of the animal genetic engineering course is to emphasize the animal genetics, DNA structure and function, chromosome structure and replication, gene linkage and mutation, the techniques and application of DNA replication and recombination, the mechanism on mutation and recombination of the gene, the expression of recombination DNA and the analysis of DNA variation.

142037 動物遺傳工程實習**1 選****沈朋志，下**

本課程配合動物遺傳工程課程使學生瞭解動物遺傳基因與 DNA 之構造與功能，其次使學生實際操作動物細胞 DNA 抽取與 DNA 純化、DNA 體外複製方法、限制酵素切割方法、重組 DNA 技術、細胞培養、標的基因之確認與選殖、標的基因表現與突變等有關技術。

142037 Animal Genetic Engineering**1 S****P. C. Shen, S****Practice.**

This course is to practice the technique in animal DNA extraction and purification, DNA replication by polymerase chain reaction, the digestion of restriction enzyme, analysis of the restriction map, DNA recombination, cells culture, identification and cloning of trait genes, target gene expression and mutation.

142038 功能性基因體學**2 選****劉世華，上**

本課程目標著重在介紹基因體完成定序的意義，不僅只是驗證解讀個別基因的功能，還著重在基因間之相互作用是如何協調與控制，以及這種基因間的協調與控制在農業、醫學、工業、生態與環保等領域所產生的正面效應。

142038 Functional Genomics 2 S S. H. Liu, F

The goals of this course intends to introduce students the concepts regarding the significance of completion of **sequencing** the whole genome, not just the annotation of gene function, but the organization and control of gene pathways that may impact on fields of griculture, medicine, industry, ecology, and environment.

142039 生物資訊學概論 2 選 劉世華, 下

本課程目的在訓練學生使用網路上的軟體程式去分析網路上的生物資料庫, 並從中解讀或汲取有用的生物資訊。課程內容包括生物資料庫簡介、DNA 與蛋白質序列比對、蛋白質與 RNA 結構預測、單核苷酸多態型(SNPs)分析、演化樹建構以及生物傳導路徑等。修課學生須至少預修過生物化學、遺傳學或分子生物學(任一門皆可)。

142039 Essential Bioinformatics 2 R S. H. Liu, S

The multidisciplinary course attempts to train students using web-based programs to analyze and retrieve useful biological information from web-based database. Topics including: biological databases, sequence alignments, structure prediction on macromolecules, single nucleotide polymorphisms (SNPs), constructure of phylogenies, molecular interaction of biopathway. Students are required to have taken at least one of the following classes: biochemistry, genetics, or molecular biology in advance.

142040 實驗動物應用學 2 選 劉世賢等, 下

本課程以實驗動物在各重要領域之應用之講授主體,授課內容由法規及管理以及應用概論入手,進而至醫學、健康食品檢測、臨床前安全及功能評估、疫苗工業以及在生殖科技等之應用進行講授。期能使學生瞭解實驗動物在各領域應用相關資訊,進而提昇未來投入實驗動物相關行業興趣。

142040 Application of Laboratory 2 S S. S. Liu et al., S

Animals

This course is to study the application of laboratory animals in different field. The content of this course includes regulation, management, general application, application in medicine, monitoring system of health foods, estimation of security and function before clinical treatment, vaccine industry and reproductive biotechnology. Students could learn the relevant information in different fields, and increase their interest in joining the industry of applied laboratory animals in the future.

142041 實驗動物應用學實習**1 選****劉世賢等，下**

本課程以實驗動物在各重要領域之應用之實習及實地參訪為主體，授課內容包括醫學、健康食品檢測、臨床前安全及功能評估、疫苗工業以及在生殖科技等之應用進行實習與實地參訪行程。期能使學生瞭解實驗動物在各領域應用相關資訊，進而提昇未來投入實驗動物相關行業興趣。

142041 Application of Laboratory Animals Practice.**1 S****S. S. Liu et.al., S**

This course is major in the practice and visiting of application of Laboratory animals in different field. The content includes the application in the medicine, the monitor of health foods, the estimate of security and function before clinical treatment, vaccine industry and reproductive biotechnology, etc. From those practice and visiting will let students understand that the relevant information in different fields are used, and then promote and invest the relevant trade interest of Laboratory animals in the future.

142042 動物基因轉殖**2 選****沈朋志，上**

本課程目的在介紹動物基因轉殖相關之技術，包含受精卵收集處理與培養、標的基因之構築、原核 DNA 顯微注射方法、胚胎培養、胚移植、標的基因之鑑定、轉殖基因品系之評估、生產基因轉殖動物與人類醫藥用蛋白質。

142042 Animal Transgenics**2 S****P. C. Shen, F**

This course is to introduce the technique for the animal transgenics. The contents include: the collecting and culture of zygote, construction of target gene, pronuclear DNA microinjection, embryo culture, embryo transfer, identification of target gene, evaluation of transgenic lines, production of transgenic animal and medicine protein for human.

142043 族群遺傳學**2 選****張秀鑾，上**

本課程旨在介紹族群遺傳學內涵與數學理論之應用，課程內容主要包括體染色體與性染色體基因座基因頻率估算、哈溫原理、配種系統、親屬間關係與改變基因頻率之壓力。

142043 Introduction to Population**2 S****H. L. Chang, F****Genetics**

The aims of this course are to introduce the insight of population genetics and to state the application of mathematical theory in this aspect. Course contents will include estimation of allele frequency for autosomal and X-chromosomal loci, Hardy-Weinberg

principle, systems of mating, relationships between relatives, and forces that change allele frequency.

142044 數量遺傳學導論

2 選

張秀鑾，下

本課程旨在介紹數量遺傳學基本原理與解說多基因性狀及其在世代間之遺傳特性，內容主要包括交替基因介紹、基因型與基因頻率估算、具上位作用之逢機配種、親屬間相似性、路徑係數、重複勢、遺傳變異率，以及單性狀與多性狀選拔等。

142044 Introduction to Quantitative

2 S

H. L. Chang, S

Genetics

The objectives of this course are to provide an introduction to the principles of quantitative genetics and to state how the polygenic traits being characterized and transmitted between generations. Contents mainly cover allelic, genotypic and gametic frequencies, random mating with epistasis, covariances between relatives, path coefficient analysis, repeatability, heritability, selection, correlated characteristics, and selection more than one characteristic.

142045 應用生物統計學

2 選

張秀鑾，下

本課程旨在介紹常用於資料分析之統計基礎原理，課程內容包括矩陣代數複習、二次型分布、迴歸、變方分析與統計模式建立策略等；最終目的在建立學生具備應用 SAS 商業套裝軟體，進行複雜資料分析與準確地解釋分析結果之能力。

142045 Applied Biostatistics

2 S

H. L. Chang, S

The course provides an introduction to fundamental theory of the most commonly used linear models in statistical data analysis. Review of matrix algebra, distribution of quadratic forms, regression, and analysis of variance are covered, as well as statistical model-building strategies. The final goal is to equip the students with the ability to correctly apply the SAS commercial statistical packages to analyze the complex data and to interpret the results accurately.

142046 遺傳評估法

2 選

張秀鑾，上

本課程之主要目的乃在闡釋計量遺傳之基本原理，並利用最佳線性無偏預測式 (BLUP) 與相關之線性混合模式法於動物育種中，結合系譜資訊與性

能紀錄進行種畜禽遺傳潛能，達到準確地選留優良種畜禽之目標。

142046 Introduction to Genetic Evaluation 2 S **H. L. Chang, S**

The aims of this course are to state the theory of quantitative genetics and the useful methodology applied in evaluation, including the best linear unbiased prediction (BLUP) and related linear mixed model, for animal breeding. The application of integration of pedigree information and performance records to improve selection accuracy for breeding stocks will be also covered.

142047 台灣畜產種原之永續利用 2 選 **張秀鑾，下**

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。

142047 Sustainable Utilization of Taiwan Farm Animal Genetic Resources 2 S **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.

142048 免疫學 3 選 **莊秀琪、
鍾文彬，下**

本課程主要提供非獸醫學生學習一般的免疫學概論，將介紹免疫系統之作用，包括免疫細胞的種類與生成機制，介紹抗原、半抗原與抗體之定義與應用，免疫系統之基本運作機制，免疫球蛋白之種類與結構，免疫細胞之功能以及免疫化學相關之應用。

142048 Immunology 3 S **H. C. Chaung,
W. B. Chung, S**

General concepts on Immunology will be introduced in this course, including different types of immune cells and their synthesis, definitions of antigens, haptens and

antibodies and their applications, the basic mechanisms in regulating immune responses, types of immunoglobulins and their structures, the functions of different immune cells and the applications of immunochemistry.

142049 胚胎學

2 選

沈朋志，上

本課程的設計主要是幫助學生了解生命的開始，包括生殖細胞的形成、受精過程、胚胎發育、胚胎著床、胚幹細胞的分化、器官形成、先天的遺傳缺陷。胚胎形成的機制包含、細胞生長、細胞凋亡、細胞分化、細胞治療與再生醫學的應用。

142049 Embryology

2 S

P. C. Shen, F

Lecture will help the students to understand the origin of life, including gametogenesis, fertilization, embryo development, implantation, differentiation of embryonic stem cells, organogenesis and congenital malformation. Mechanisms of embryogenesis contain cell growth, apoptosis, cell differentiation, cell therapy and the application on regenerative medicine.

142050 農業政策與法規

2 選

張秀鑾等，上

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。

142050 Agricultural Policy and Laws

2 S

H. L. Chang *et al.*, F

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.

142051 馬學

2 選

劉炳燦、

劉世賢，下

本課程係討論馬的飼養及管理有關的各項問題，內容包括有養馬事業的

歷史與發展、馬的鑑別與選拔、品種與類型、營養與飼料、日常照料、行為與調教、馬廄管理、馬的放牧及衛生管理。

142051 Equine Science

2 S

B.T. Liu

S.S. Liu, S

The course will deal with the feeding and management of horse. It will cover the history and development of the horses industry, selecting and judging horses, breeds and types of horses, nutrition and feeds for horses, feeding and management, horse behavior and training, pasture for horses, and horses health, disease prevention, and parasite control.

142052 馬學實習

1 選

劉炳燦、

劉世賢，下

本實習課程旨在探討馬的習性、飼養管理及御馬，並使學生習得馬飼養、清潔、修蹄、騎乘之基本技能。主要課程內容包括：馬的習性、馬舍管理、馬之調教清潔、馬蹄保護及騎乘。

142052 Equine Science Practice

1 S

B.T. Liu

S.S. Liu, S

The purpose of this course is to give students more familiar with horse behavior, management, horse training, and horse driving. It contains: horse behavior and training, care and management, herd health, hoof care, and the skill of horses riding.

142053 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。

142053 Monogastric Animal Nutrition

2 S

H. H. Hsieh, F

and Feed

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.

142054反芻動物營養與飼料

2 選

余祺，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。

142054 Ruminant Nutrition and Feed

2 S

C. Yu, 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.

142055牧場經營學

2 選

未定，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。

142055 Livestock Production

2 S

,S

Management

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.

142056飼料製造技術

1 選

謝豪晃，上

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

142056 Feed Manufacture Technology 1 S

H. H. Hsieh, F

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

142057 飼料製造技術實習

1 選

謝豪晃，上

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

142057 Feed Manufacture

1 S

H. H. Hsieh, F

Technology Practice.

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.

142058 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。

142058 Design of Feed Formulation

2 S

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.

142059 動物行為**2 選****夏良宙，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。

142059 Animal Behavior**2 S****L. C. Hsia, F**

This course is an 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.

142060 家畜環境生理學**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。

142060 Environmental Physiology of**2 S****H. H. Hsieh, F****Domestic Animals.**

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.

142061 寵物飼養管理**2 選****余祺，下**

本課程之授課內容包括：寵物種類來源、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。

142061 Pet Feeding and Management**2 S****C. Yu, S**

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 pet animals. It is hoped that this study will serve as a guide for advanced in the field of pet feeding.

142062 肉用草食家畜飼養管理 2 選 未定，下

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。

142062 Meat-production Ruminant 2 S , S

**Farm Animal Feeding and
Management**

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

142063 水禽飼養管理 2 選 未定，下

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。

142063 Waterfowl Feeding and 2 S , S

Management

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.

142064 鹿學 2 選 劉炳燦，上

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。

142064 Deer Science

2 S

B. T. Liu, F

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.

142065動物福利

2 選

夏良宙，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。

142065 Animal Welfare

2 S

L. C. Hsia, 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.

142066禽畜廢棄物管理

2 選

未定，下

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。

142066 Poultry and Livestock Waste

2 S

, S

Management

The purpose of this course is to assist the students to understand the characteristics of animal waste, the general principles and techniques of treatment, the design of

wastewater treatment plant, composting treatment, odor control and sludge minimization in order to achieve the EPA required standards.

142067 禽畜廢棄物管理實習

1 選

未定，下

本課程旨在協助學生熟悉畜牧廢水或排放水之一般分析，其中包括實驗室之安全注意事項，品保與品管，廢水之取樣與保存，QC，COD、BOD、TS、SS、VSS、N、P、PH，杯皿試驗，導電度，透視度與沈降性試驗與堆肥腐熟度與有機質分析。

142067 Poultry and Livestock Waste 1 S

, S

Management Practices

The purpose of this Course to is assist the students to understand the analysis and sampling procedure of wastewater and discharge water including the QA and QC of laboratory, COD, BOD, TS, SS, VSS, N, P, PH, jar test, conductivity, transparency test and SV₃₀ test, compost maturity and organic matter analysis.

142068 安全畜產品生產導論

2 選

未定，上

本課程探討安全性畜產品生產之一貫作業方式，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、動物飼養管理、防疫監測、安全性加工生產及安全性廢棄物處理。

142068 Introduction to Safe Animal

2 S

, F

Production

The arrangement of this course is to let the student understand the knowledge about safe animal production chain. The major concepts of this course include: the safety definition, feeds quality, feed additives, feeding and management, diseases control, safe processing, and safe waste management.

142069 安全畜產品生產技術

2 選

未定，上

本課程探討安全性畜產品生產之技術，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。

142069 Techniques of Safe Animal

2 S

, F

Production

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.

142070安全畜產品檢驗與品管 **2 選** **林美貞，上**

本課程使學生了解安全畜產品檢驗與分析的儀器與設備之基本構造、分析方法、原理與應用範疇。主要內容包括樣品處理、儀器分析原理、精密儀器分析原理、法規及標準檢驗法。

142070 Safe Animal Products Analysis **2 S** **M. J. Lin, F**
and Quality Control

This course will discuss the methods, principles, and applications of analytical instruments for safe animal products. The major contents conclude handling of samples, basic theory of analytical instruments, laws and regulation of analysis of animal products.

142071食品與餐飲法規 **2 選** **未定，上**

本課程在於介紹現行各種有關於食品及餐飲法令，包括食品生產製造、食品管理、畜產相關法規及相關餐飲法規等有關法令，從法令施行得失案例、現況等與學生共同探討，藉以充實法律常識、培育畜牧、食品加工及餐飲人具有專業及法律的完整人。

142071 Law and Regulation of Food and **2 S** **, F**
Foodservice Management

The objective of this course is to give the students the whole concept of laws and regulations of food and foodservice management, including laws and regulations related to food processing, food management, animal production, and foodservice management. The discussion will be in regard to the administration of current cases in order to give the students more common knowledge of administrative regulations.

142072畜產品檢驗與分析 **2 選** **林美貞，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。

142072, Analysis of Animal Products **2 S** **M. J. Lin, 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.

142073 畜產品檢驗與分析實習 1 選 林美貞，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。

142073 Animal Products 1 S M. J. Lin, F

Analysis Practice.

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.

142074 肉品加工 2 選 未定，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。

142074 Processing of Meat Products 2 S , 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.

142075 肉品加工實習 1 選 未定，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。

142075 Meat Products Lab Practice 1 S , 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.

142076乳品加工

2 選

林美貞, 上

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

142076 Processing of Dairy Products

2 S

M. J. Lin, S

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.

142077乳品加工實習

1 選

林美貞, 上

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

142077 Dairy Processing Practice

1 S

M. J. Lin, S

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.

142078蛋品加工

2 選

未定, 上

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。

142078 Processing of Egg Products

2 S

, 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.

142079 蛋品加工實習**1 選****未定，上**

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。

142079 Egg Products Lab Practice.**1 S****, 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.

142080 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。

142080 Application of Animal Products**2 S****M. J. Lin, S****on Beauty Industry**

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.

142081 畜產企業實務實習**1 選****未定，上**

為落實畜產系學生對整體畜產經營實務之技術，藉以整合在校所學各科目之連貫性，鼓勵學生利用學期外之時間至產業界現場進行完整的經營實務訓練，而開設此一課程。本課程之安排，於事先經系務會議篩選具規模且經營上軌有制度之畜產企業單位，包括公、民營機構，雙方取得共識，安排必要之實習項目與進度，於寒、暑假期間，共實習 30 日，完成預定進度，繳交報告，並經實習單位及系主任共同考核合格者，始給予學分。

142081 Practice of Livestock**1 S****, F****Enterprises**

This course is designed to offer the students a link to the livestock industry and to enforce their ability in operating an integrate livestock production unit. Students in this course will be appointed to some selected enterprises or companies with livestock production units during summer or winter vacations for 30 days of training program. Students who complete the practical training program with writing reports and pass the evaluation by both the department and the counterpart will be granted the credits.

動物科學與畜產系 Department of Animal Science

課程代號 Course Number	科目名稱(中 文) Course (Chinese)	學分 Credit	科目名稱(英 文) Course (English)	頁次 Page
專業必修科目 Required Courses				
146001	專題討論	4	Seminar	
專業選修科目 Elective Courses				
146002	動物試驗設計	2	Experimental Designs for Farm Animals	
146003	應用畜產微生物	2	Applied Microbiology in Animal Science	
146004	動物科學文獻選讀	2	Literature Studying	
146005	專技英文寫作	2	Scientific Writing in English for Chinese Authors	
146006	科學論文寫作	2	Thesis Writing	
146007	高等生物統計學	2	Advanced Biometry	
146008	細胞生物學特論	2	Advanced Cell Biology	
146009	生物技術特論	2	Special Topics on Biotechnology	
146010	動物複製學	2	Animal Cloning	
146011	動物生殖生理特論	2	Special Topics on Animal Reproductive Physiology	
146012	泌乳生理學	2	Physiology of Lactation	
146013	經濟動物繁殖管理特論	2	Special Topics on Farm Animal Reproductive Management	
146014	線性模式與育種	2	Linear Model and Breeding	
146015	數量遺傳與動物模式論	2	Quantitative Genetics and Animal Model Methodology	
146016	遺傳參數估計	2	Estimation of Genetic Parameters	
146017	應用生物資訊學	2	Applied Bioinformatics	
146018	動物基因轉殖特論	2	Special Topics on Animal Transgenics	
146019	家畜營養生理	2	Special Topics on Animal Nutritional Physiology	
146020	消化道生理	2	Digestive Physiology	
146021	動物代謝調節	2	Animal Metabolic Regulation	
146022	生長發育學	2	Growth and Development	
146023	分子營養學	2	Molecular Nutrition	
146024	環境溫度與禽畜生產	2	Environmental Temperature and Livestock Production	
146025	飼料技術特論	2	Special Topics on Feed Manufacture Technology	
146026	機能性畜產品生產	2	Production of Functional Animal Products	
146027	種禽營養與飼養管理	2	Nutrition and Management of Poultry Breeders	
146028	安全畜產品生產特論	2	Special Topics on Safe Animal Production	
146029	畜產經營特論	2	Special Topics on Livestock Production	

Management				
課程代號 Course Number	科目名稱(中 文) Course (Chinese)	學 分 Credit	科目名稱(英 文) Course (English)	頁次 Page
專業選修科目 Elective Courses				
146030	乳品化學	2	Dairy Chemistry	
146031	肉品化學	2	Chemistry of Meat Tissue	
146032	乳品加工特論	2	Special Topics on Milk Products Processing	
146033	肉品加工特論	2	Special Topics on Meat Products Processing	
146034	畜產品品質管制	2	Quality Control of Animal Products	
146035	蛋品加工特論	2	Special Topics on Egg Product Processing	
146036	禽畜副產物利用	2	Utilization of Animal and Poultry Byproducts	
146037	加工副原料之應用	2	Applying Additives to Processing of Animal Products	
146038	動物新產品開發方法論	2	Methodology of Animal Products Development	
146039	草食動物營養特論	2	Special Topics on Nutrition for Herbivores	
146040	畜產污染防治與資源利用	2	Livestock Pollution Control and Resource Utilization	
146041	動物複製學實習	1	Animal Cloning Lab.	

動物科學與畜產系

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一、必修科目 Required Courses

146001 專題討論

4 必 全系老師，上下

本課程旨訓練研究生對於與畜產科學或論文有關的題目，經由資料之收集、研讀與彙整，令學生從而習得相關之專業知識，並由之獲得資料之分析、歸納與邏輯思考、試驗設計與統計、數據分析與統整之能力。並藉由書面報告、口頭發表及討論之歷練，以培養學生之論文撰寫能力及口頭表達能力。

142001 Seminar

4 R Faculties, F, S

The purpose of this course is to give graduate students the trainings on searching information, reviewing references related to animal science or their research topics, therefore, the abilities on logical thinking, experimental design, data collection and analysis, results discussion. Students are required to select a topic in the field of animal science or that related to their thesis. Students must give oral presentation and dissertation.

二、選修科目 Selective Courses

146002 動物試驗設計

2 選 劉世華，下

本課程旨在介紹試驗設計於控制動物試驗誤差之有效應用，並伴隨著適當合理的統計分析法，應付不同形態與性質之資料。授課內容主要包括優良試驗法則、完全隨機設計、拉丁方設計、交叉設計、複因子設計、不均衡設計、巢式設計與變積分析等。

146002 Experimental Designs

2 S S.H. Liu, S

for Farm Animals

The aims of this course are to state the error control via optimum design and the application of robust statistical methodologies for various types of dataset from farm animal experiment. The main content covers the principles of good experiment, completely randomized design, Latin square design, change-over design, factorial design, unbalanced design, nested design and analysis of covariance.

146003 應用畜產微生物**2 選****林美貞，上**

本課程討論微生物資源運用、發酵產品生產以及防治有害微生物的原理和方法。內容包括菌種選育、微生物發酵、發酵食品、食品污染與腐敗、食品保存與微生物管制等，並討論畜產相關微生物之最新資訊。

146003 Applied Microbiology**2 S****M. J. Lin, F****in Animal Science**

This course discusses the utilization of microbiological recourses, the production of fermented products and prevention of pathogenic and spoilage microorganisms. The content of this course includes culture selection, fermentation, fermented foods, food contamination and spoilage, food preservation and microbiological control, and the new information of related subjects.

146004 動物科學文獻選讀**2 選****全系老師，上**

本課程將講授論文寫作與研究方法的基本架構、必要守則、及重要關鍵。透過研讀畜產科技中各種不同知識領域（遺傳育種、生理、營養、飼養、肉品和乳品加工）的中英文期刊論文，訓練研究生熟悉論文查詢、英文論文閱讀、科學論文的研究方法與寫作技巧。

146004 Literature Studying**2 S****Faculties, F**

This course will teach graduate students the basic structure, logic and important rules of both research methodology and scientific writing. It includes studying both Chinese and English published papers in various fields of animal science, including genetics, breeding, physiology, nutrition, feeding, meat processing and dairy processing. The aim of this course is to improve students' ability on paper searching, English literature studying, research techniques and scientific writing skills.

146005 專技英文寫作**2 選****林美貞等，上**

本課程旨在訓練研究生專業英文之寫作，本課程將針對國人於英文科學論文寫作易有之用詞錯誤、文法錯誤及邏輯編寫錯誤加以探討。期望研究生於修習本課程後，具備撰寫論文英文摘要之能力。

146005 Scientific Writing in**2 S****M. J. Lin et al., F****English for Chinese Authors**

This course will be emphasis on writing. After successfully completing this course, the student will have obtained confidence and new skills to write scientific English sentences without serious grammatical errors, avoid errors in English that are most common to Chinese authors, prepare a summary in English of a scientific paper in Mandarin, plan and organize a research project and describe it in a scientific paper, and complete an effective resume for employment application.

146006 科學論文寫作**2 選****沈朋志、****林美貞，上**

本課程旨在訓練研究生對相關論文查詢、資料蒐集、整理、引用及表達的能力。學生選擇論文有關的主題，蒐集文獻、閱讀、並將論文主題相關之試驗結果整理成摘要，提出報告並與共同討論。

146006 Thesis Writing**2 S****P.C. Shen,****M. J. Lin, F**

This course is designed to train graduate students the ability in searching literature, organizing material and data, and presenting results. Students are required to select a topic in the field of those related to their thesis, search and review literature and draw up a brief.

146007 高等生物統計學**2 選****張秀鑾，上**

課程主要目的在探討可應用於試驗與調查資料之統計分析方法，包括變異數分析、共變異數分析、單迴歸與複迴歸分析，以及卡方檢定；內容並針對所得資料變因之量化與推論可信度等方面進行探討。作業係以 SAS 統計套裝軟體為輔助工具。

146007 Advanced Biometry**2 S****H. L. Chang, F**

Introduction to advanced statistical methods for analyzing experimental and survey data. Statistical methods covered will include analysis of variance, analysis of covariance, simple and multiple linear regression, and Chi-square tests. Course emphasis on quantifying sources of variation and making inference from data collected. These assignments will involve mainly making informative inference via SAS package.

146008 細胞生物學特論**2 選****余祺，上**

此課程的設計是介紹細胞的重要功能，針對細胞的結構、胞器的功能及生長

過程、DNA 的表現、RNA 的修飾成熟、蛋白質的合成、包括癌症細胞的發生原因免疫細胞及免疫球蛋白的分化機制等，可作為從事研究生物科技、生物醫學、基因轉殖等相關研究基礎。

146008 Advanced Cell Biology 2 S C. Yu, F

This course is an extensively presentation of the molecular cell biology, Lectures including cell nucleus, cytoplasmic membrane systems, the control of gene expression, RNA splicing, protein synthesis and trafficking, mechanism of tumor cells and immune response.

146009 生物技術特論 2 選 沈朋志，下

本課程內容一方面介紹 DNA 抽取、限制酵素切割、DNA 片段增殖、DNA 序列分析及 PCR 技術。另方面將介紹生殖細胞體外調控技術、胚顯微操作、基因轉殖及動物複製技術，以及功能性基因體分析技術。

146009 Special Topics on Biotechnology 2 S P. C. Shen, S

The course emphasizes two main subjects. One subject includes extraction of DNA, restrict enzyme function, DNA replication, DNA fragment analysis and PCR technique. The other subject includes germ cell, embryo manipulation and transgenic or cloning animal producing methods and the techniques of functional genomic analysis.

146010 動物複製學 2 選 沈朋志，上

本課程主要目的乃希望結胚胎學，胚顯微操作技術與銘印基因表現調控理論，讓學生了解動物複製的基本知識及其於農業及醫學之應用層面，進而提供他們未來能於生物科學領域之相關研究，得以更進一步的探究。

146010 Animal Cloning 2 S P. C. Shen, F

The purpose of this course aims to combine the embryology, the technique of embryo micromanipulation and the regulation of imprinting gene for the students to understand the principle and knowledge of animal cloning and its application in agriculture and Medical science. Several techniques pertaining to bioscience will also be discussed to strengthen the students with the ability for future advanced studies.

146011 動物生殖生理特論 2 選 沈朋志、
劉炳燦，上

由於動物生殖現象存有相當程度之變化，本課程將試著引導學生充分了解一般共同生殖要點及各動物生殖細節之不同，並著重生殖技術方法之介紹，使學生對哺乳動物生殖有全面認識。課程內容著重於性別、性腺功能、懷孕分娩；一般生殖技術；生物技術應用於生殖。

146011 Special Topics on Animal 2 S P. C. Shen, B. T. Liu, F

Reproductive Physiology

A lot of variation in the reproduction is observed amongst different species. The objection of this course attempt to discuss the general fundamental facts and details differ on reproductive events for students can take a whole picture on mammalian reproduction. We also emphasize to introduce the research or farm practice technique on reproduction. Course contents include: Sex, gland function and pregnancy and parturition; Basic reproductive technique; Modern biological technique on reproduction.

146012 泌乳生理學 2 選 劉炳燦，上

本課程目的乃在探討與泌乳有關之生理因子，內容包括：牛乳生合成及細胞分泌機制、內分泌對乳腺及泌乳之影響、營養因子對泌乳之影響、環境因子對泌乳之影響、生物技術應用於泌乳、及乳房炎及其預防。

146012 Physiology of Lactation 2 S B. T. Liu, F

This course is intended to review and discuss the physiological factors on lactation. Course contents include biosynthesis and cellular secretion of milk, endocrine control of mammary gland and lactation, nutritional aspects of lactation, environmental aspects of lactation, biotechnology on lactation, and mastitis and the defense system.

146013 經濟動物繁殖管理特論 2 選 劉炳燦，上

本課程係以文獻檢討之方式，介紹近年來在家畜繁殖技術方面之進展。課程內容包括：發情與配種之人工控制，包括發情同期化及排卵時間之控制；季節性繁殖家畜之季節外配種控制，特別是在綿羊與山羊；家畜胚之體外生產技術，包括卵母細胞之體外成熟、體外受精及受精卵體外培養至囊胚階段；家畜精液與胚之冷凍保存技術，由傳統慢速冷凍發展至玻璃化冷凍；精子與胚之性別鑑定，包括 flowcytometry 與 PCR 技術之應用；胚操作與移置相關技術；家畜之複製，以細胞核移置及複製後之相關問題為主。

Reproductive Management

This subject provides the introduction of the progress on reproductive technology in farm animals in recent years through reference reviewing. The contents of the subject includes: Artificial control of estrus and breeding, including estrus synchronization and control of ovulation timing. Control of breeding in seasonal breeders out of season particularly in sheep and goat. Production of embryos in vitro including maturation and fertilization of oocytes, and culture of embryos until blastocyst stage. Cryopreservation of semen and embryos, development of vitrification method out of conventional slow freezing method. Sexing of spermatozoa and embryos including the application of flowcytometry and PCR techniques. Manipulation and transplantation of embryos. Cloning of farm animals mainly the nuclear transfer and associated problems after cloning.

146014 線性模式與育種

2 選

張秀鑾, 下

本課程主要目的在探討線性統計模式之一般估計量與統計假說之檢定，及其於遺傳育種之應用。內容除著重於統計育種之理論基礎外，尚包括應用矩陣代數於線性模式之統計分析與 SAS 電腦套裝軟體之理論背景闡釋，建立統計分析正確理念與提升學生應用 SAS 系統之純熟能力。

146014 Linear Model and Breeding

2 S

H. L. Chang, S

The aims of this course will be emphasis on the study of the general estimation problems and test the testable hypothesis for linear statistical model, and thus applied to the genetic and breeding aspects. In addition to theory of statistical breeding, topics will cover useful matrix algebra for linear model methodology and statistical insights of SAS package, and thus enhance the students' ability when the statistical package employed.

146015 數量遺傳與動物模式論

2 選

張秀鑾, 上

課程旨在延伸線性統計模式與分析方法之應用，主要著重於應用動物模式於畜產動物遺傳評估與選種策略之整合應用。內容包括動物模式介紹、種畜禽關係係數與近親係數估計、動物模式延伸、多性狀動物模式與非累加遺傳模式建立與應用。

146015 Quantitative genetics and

2 S

H. L. Chang, F

animal model methodology

This graduate course is intended to extend the application of linear statistical models and methods in the genetic evaluation and selection strategy for farm animal with focus on animal

model methodology. Course content includes animal model introduction, estimation of relationship and inbreeding coefficients, animal model extension, multiple traits animal model and non-additive genetic model building and application in farm animal selection program.

146016遺傳參數估計

2 選

張秀鑾，下

課程目的在使學生熟悉遺傳評估用之各項遺傳參數定義與性質，使其能正確應用於經濟動物改良實務面。授課內容包括畜產動物間親屬共變方、重要經濟性狀相關、變方估計法、遺傳變變方估計與應用。

146016 Estimation of genetic

2 S

H. L. Chang, S

parameters

The objectives of this course are to provide an understanding of genetic parameters including definition, attributes and application in selection program for animal industry. Material covers covariance between relatives, correlations among economical important traits, estimation methodology for variances, and evaluation of genetic parameter estimator, as well as the potential practiced in production level.

146017應用生物資訊學

2 選

劉世華，上

本課程旨在透過序列分析與電腦運算方式闡釋，使學生瞭解蛋白質功能表現與生物性狀之關係，培養學生熟悉生物資訊庫之搜尋程序與資源應用技術。課程內容包括網路資源介紹、序列比對、分析與註解、應用軟體介紹與公開網站與資料庫搜尋。

146017 Applied Bioinformatics

2 S

S.H. Liu, F

The course is to explore the relationship between proteomic and biological traits via sequence analysis and computation protocols, and thus provides students with skillful techniques in both searching and resources application for bio-databases. Course content includes an introduction of web sites, skill in sequence alignment, analysis and annotation, useful software application, and public web and databases searching capability.

142018動物基因轉殖特論

2 選

沈朋志，下

本課程主要目的乃希望結合胚胎學，各種基因轉殖操作技術與基因表現調控理論，讓學生了解基因轉殖的基本知識及其於農業及醫學之應用層面，課程內容，包含受精卵收集處理與培養、標的基因之構築、基因轉殖方法、胚胎培養、胚移置、標的基因之鑑定、轉殖基因品系之評估、基因表現調控、生產基因轉殖

動物與人類醫藥用蛋白質。

142018 Specific Topics on

2 S

P. C. Shen, S

Animal Transgenics

The purpose of this course aims to combine the embryology, the techniques of animal transgenics and the regulation of gene expression for the students to understand the principle and knowledge of animal transgenics and its application in agriculture and Medical science. The contents include: the collecting and culture of zygote, construction of target gene, introduce the techniques of animal transgenics, embryo culture, embryo transfer, identification of target gene, evaluation of transgenic lines, regulation of gene expression, production of transgenic animal and medicine protein for human.

146019家畜營養生理

2 選

謝豪晃, 上

本課程主要探討家畜營養與生理之關係，瞭解如何從營養觀點在維持正常健康之家畜，以及不適當的營養對家畜所造成之影響。課程內容包括：各種營養素之營養生理功能、討論各種動物之消化系及其營養生理、進一步探討不同生理功能及生理階段之特殊營養需要。

146019 Special Topics on Animal

2 S

H. H. Hsieh, F

Nutritional Physiology

The objectives of this course are: To discuss the relation between animal nutrition and physiology, To understand how to maintain animal health through nutrition, To address the influence of improper nutrition on animal production. The course contents include: The physiological functions of all nutrients, include carbohydrate, lipid, protein, vitamins and minerals, discussion on the digestive physiology of different animals and the roles in nutritional physiology, further discussion on the special nutritional needs in various physiological functions and phases.

146020消化道生理

2 選

余 祺, 上

本課程旨在探討動物消化腺所分泌之消化液、調節作用功能、對營養分之利用及保護動物體免受病菌感染之免疫機制。主要內容包括：消化道之解剖生理、消化器官之生長發育、消化液之分泌調控、養分消化吸收及排泄、腸道微生物、及腸道黏膜免疫機制。

146020 Digestive Physiology

2 S

C. Yu, F

The objective of digestive physiology is to introduce the digestive enzyme secretion, nutrient requirement and metabolism, and gastro-intestinal tract immunology. The major

concepts of this course include: anatomy of the gastro-intestinal tract, growth and development of the digestive system, regulation of digestive enzymes, digestion, absorption, and excretion of nutrients, microbiology of the gut, and immune response of intestinal mucosa.

146021 動物代謝調節

2 選

余 祺，下

本課程旨在探討動物各器官組織之營養分代謝及調控方式，以培養學生研習營養分代謝調節之相關課題能力。主要內容包括：腸道及血液內養分之運輸、營養素於肝臟之代謝、肌肉及腦之能量蛋白質代謝、脂肪組織、骨骼之養分代謝、腎臟代謝及電解質平衡。

146021 Animal Metabolic Regulation

2 S

C. Yu, S

The objective of this course is to discuss the metabolic regulation of different organs and tissues in farm animal. Students will familiar with the metabolic regulation of nutrients and apply the principle on their research. The main contents of this course include: transport properties in blood and gut, nutrients metabolism in liver, protein and energy metabolism in muscle, adipose tissue, nutrients metabolism in bone, kidney metabolism, and electron balance.

146022 生長發育學

2 選

夏良宙，上

本課程目的主要探討動物生長，瞭解生長後可用於育種、營養、肉品、生物工程等，其內容為：細胞發展與身體組成、生長控制機制、胚生長、骨骼生長發育、脂肪生長發育、肌肉生長發育、身體組成生長曲線、身體生長量測、生長遺傳控制、營養對生長之影響、激素對體組成之影響、環境對體組成之影響、肌肉量和質的關係、生長與性成熟。

146022 Growth and Development

2 S

L. C. Hsia, F

The purpose of the course is to study animal growth; consequently the knowledge can be applied to animal breed, nutrition, meat science, biotechnology production, etc. The content will include: Cellular development and body composition; Growth control mechanisms; Prenatal growth; Bone growth and development; Fat development and deposition; Muscle growth and development; Body composition and growth curves; Methods to measure body composition; Genetic regulation of growth; Influence of nutrition on body composition; Hormonal influence on body composition; Environmental influence on body composition; Relationship of muscle quality to quantity; Growth and sex maturity.

146023 分子營養學

2 選

余 祺，下

本課程旨在介紹分子營養學的發展及現今研究之幾種營養素對基因表達的影響，同時敘述基因多態性對部分營養物質之吸收、代謝及利用之作用。主要內容包括：代謝和基因調控、基因結構和基因表現、碳水化合物、蛋白質、脂肪對基因表達的調控、維生素及礦物質對基因表達之調節，及分子營養學之展望。

146023 Molecular Nutrition

2 S

C. Yu, S

The objective of this course is to introduce the development of molecular nutrition and up date information of nutrients on gene expression, and the function and metabolic pathways that the genes involved. The major concepts include: metabolism and regulation, gene structure and gene expression, carbohydrate on gene expression, protein on gene expression, lipids regulation, vitamins and gene expression, minerals and gene expression, and the perspective of molecular nutrition.

146024環境溫度與禽畜生產

2 選

夏良宙，上

本課程之目的在探討高環境溫度下，家畜禽生產所遇到的問題及解決之方法。課程內容包括，熱帶畜牧對動物生產之影響，環境之定義，溫度相關知識，溫度對生理之影響，溫度和營養之關係，高溫對豬之影響，高溫對牛之影響，高溫對羊之影響，高溫對種雞之影響，高溫對肉雞之影響，高溫對蛋雞之影響，高溫對其他動物之影響，高溫對牧草生產之影響。

146024 Environmental Temperature

2 S

L. C. Hsia, F

and Livestock Production

The purpose of this course is to study the effect of high environmental temperature on animal production, and how to solve the problems. The following topics included in the course. Animal production problem under tropical environment, environment, temperature, the effect of temperature on physiology, the effect of temperature on nutrition metabolism, the effect of high temperature on pigs, the effect of high temperature on cattle, the effect of high temperature on sheep and goat, the effect of high temperature on breed chicken, the effect of high temperature on broiler, the effect of high temperature on layer, the effect of high temperature on other animal, the effect of high temperature on forage grass.

146025飼料技術特論

2 選

未定，下

本課程係討論禽畜飼料之最新科技，其內容包括：飼料原料中抗營養因子之去除技術、配合飼料之製造技術與品管、飼料配方設計技術、飼料科技之研發動向。

146025 Special Topics on Feed 2 S S

Manufacture Technology

This course will discuss the modern science and technology of livestock feeds, which contains: Disjoin techniques on anti-nutrient factor of ingredient feeds; The processing and quality control of formular feeds; Design technique of livestock feed formualtion; The research advancement of feeds science and technology.

146026 機能性畜產品生產 2 選 鄭長義, 上

本課程主要係探討各種機能性畜產品之生產技術, 課程內容包括: 機能性畜產品之市場現況、機能性畜產品之機能作用、免疫抗體之機能作用、雞蛋中生物活性物質之機能作用、機能性畜產品之生產技術(包括機能性蛋品、肉品及乳品等)。

146026 Production of Functional 2 S C. Y. Cheng, F

Animal Products

The purposes of this course are to studies the production technology of functional animal products, which contains introduction on the currents situation of the production and marketing for functional animal products, the function of functional animal products, the function of immunoglobulin yolk (IgY), the function of active material in egg, the production technology of functional animal products of egg, meat and milks.

146027 種禽營養與飼養管理 2 選 謝豪晃, 下

本課程旨在使學生瞭解種禽的營養與飼養管理相關知識。主要內容包括育種、孵化管理、飼養技術、雞舍設備、飼料配方、及種禽種蛋生產效益。

146027 Nutrition and Management 2 S H. H. Hsieh, S

of Poultry Breeders

The objective of this course is to introduce the advanced theory and practical operation technique of poultry breeders to students. The contents include: poultry breeding, incubation and hatchery management, brooding and rearing, houses and equipment, feed ingredients and nutrient requirement, marketing eggs, and marketing poultry.

146028 安全畜產品生產特論 2 選 未定, 下

本課程旨在探討抗生素造成之問題及取代抗菌藥物之畜產品生產。主要內容包括無藥物殘留畜產品介紹、取代抗菌藥物之物質與安全性畜產品、及無菌無污

S

Animal Production

Current topics in safe animal production will be discussed, with special emphasis on the problems of antibiotic residues, the various species of antibiotic replacers, and the production of free contamination safe animal products.

未定，下

本課程乃系統性地介紹畜產經營應具備之技能，包括：畜產企業管理學內涵、不同評價之成本項目與效益分析、畜產企業經營規劃與決策、畜產企業行銷、資料收集與分析、畜產企業政策與環保問題、預測方法、畜產企業組織、畜產企業產品生產與規劃、人力資源、畜產企業資金與預算、畜產企業控制原則、畜產企業成本與收益觀念、畜產企業經營目標之設計。

S

Production Management

This course gives a systematic knowledge for livestock production manager. It includes the contents as livestock business, cost evaluation and benefit analysis, planning and decision, livestock business marketing, information collection and analysis, policy and ecosystem protection, forecasting, livestock business organization, products and production planning, manpower resources, capital and budget, controlling, cost and revenue, and management indicators.

林美貞，上

本課程討論原料乳及乳製品加工及儲存過程中之變化。課程內容包括供人類飲用之哺乳動物乳汁之組成與物理化學特性；各式乳與乳製品於加工過程中各種化學變化及重要機制；微生物發酵之理化變化；以及貯存期間乳與乳製品品質之變化。

M. J. Lin, F

This course discusses the changes of raw milk and dairy products during processing and storage. The content of this course includes the composition and physical-chemical properties of milk from various domestic mammals; chemical changes and mechanisms of dairy products during processing; physical-chemical changes of milk during fermentation; and the changes of quality of dairy products during storage.

146031 肉品化學**2 選****未定，上**

本課程著重於肉品之組成、性質以及肉品加工、貯藏過程中之變化。內容包含：脂肪、蛋白質、酵素、碳水化合物、灰分、維生素與水之結構、物理化學特性，肉色，酸鹼度，肉品加熱與冷卻之方法與影響等。

146031 Chemistry of Meat Tissue**2 S****, F**

This course focuses on the composition, characteristics, and changes of meat and meat products during processing and storage. Also, the structures, physic-chemical properties of lipids, proteins, enzymes, carbohydrates, ash, and vitamins are also addressed. Meat colors, pH, influences caused by heating and cooling are also covered.

146032 乳品加工特論**2 選****林美貞，下**

本課程討論乳製品加工及儲存方法與條件對乳與乳製品品質之影響。課程內容包括供人類飲用之哺乳動物乳汁之組成與差異性；各式乳與乳製品原料之應用、處理與儲存；加工技術之原理與方法；以及加工處理及貯存條件，對乳製品理化及風味品質之影響。

146032 Special Topics on Milk**2 S****M. J. Lin, S****Products Processing**

This course discusses the effects of processing methods and storage condition on the quality of milk and dairy products. The content of this course includes the variation of milk composition from various domestic mammals; storage, processing and application of raw milk; technical procedures involving producing various dairy products; and the effects of processing and storage conditions on the physical-chemical and sensory properties of dairy products.

146033 肉品加工特論**2 選****未定，下**

本課程著重於肉品加工過程中技術、化學與微生物間之相關，使學生充分了解肉品科學之關聯性。

146033 Special Topics on Meat**2 S****, S****Products Processing**

This course set in the context of the concepts of technology, chemistry and microbiology of meat manufacturing processing, provide a full comprehensive understanding of meat science.

146034 畜產品品質管制**2 選****未定，上**

本課程主要討論畜產品之品質管制與衛生，家畜健康對畜產品品質的關係。主要內容包括屠前家畜的處理，肉品工廠中肉品管理，肉品處理與肉品工廠清潔。集乳與授乳衛生，乳品一般處理及品質測定。

146034 Quality Control of Animal**2 S****, F****Products**

This course will discuss the quality control, sanitation and inspection of animal products, animal health in relation to the quality of animal products. The major chapter contents transportation and handling of livestock prior to slaughter, meat inspection, handling of meat, quality control of meat and meat plant cleaning, collection and reception of milk, general milk treatment, quality control of milk and milk products.

146035 蛋品加工特論**2 選****未定，上**

本課程就蛋之利用以及過去與未來各式蛋製品之加工趨勢，分別就蛋之化學性狀，非食品類之利用，營養與功能性之修飾或蛋製品之設計等之技術等加以廣泛討論。

146035 Special Topics on**2 S****F****Egg Products Processing**

The course discuss wide range of egg uses and processing technologies including current and future world tends, separation technologies for egg chemicals properties, non-food uses, functional and nutritional modification or designing of egg products.

146036 禽畜副產品利用**2 選****未定，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

146036 Utilization of Animal**2 S****S****and Poultry Byproducts**

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, fater, dairy, and egg byproducts will also be addressed. Finally,

uses of these byproducts in food processing, industries, and medical application will also be included.

146037 加工副原料之應用

2 選

林美貞，下

本課程討論畜產加工領域中除乳、肉及蛋以外之副原料之應用及原理。內容包括乳品、肉品及蛋品加工中常用之添加劑；營養強化物質及機能性成分物質之添加；食品添加物使用規範及相關法規；及畜產品作為其他食品產業副原料之應用。

146037 Applying Additives to

2 S

M. J. Lin, S

Processing of Animal Products

This course discusses the application and principle of applying additives to animal products processing. The content of this course includes common additives of dairy, meat and egg processing; addition of nutrient fortification and functional ingredients; regulation of additives usage; and application of animal products on food industry.

146038 動物新產品開發方法論

2 選

林美貞，上

本課程討論動物產品研發之流程、方法及整體評估方式。內容包括新產品設計、市場評估法、成本分析、風險評估、研發方法、製程調整及製造、產品包裝、相關法規及規範、專利及智慧財產權、動物新產品開發方向及趨勢。

146038 Methodology of Animal

2 S

M. J. Lin, F

Products Development

This course discusses the developing procedures and evaluating methodology of new animal products. The content of this course includes designing new products, consumer research, prototype development, financial evaluation, risk analysis, technical plan, other R&D methodology, manufacturing, food packaging, safety and regulation, protection of intellectual property, and focal issue in animal science and food science.

146039 草食動物營養特論

2 選

未定，上

本課程之目的在於介紹反芻動物生態系統之生物學，並探討此系統之問題與無法解決之困擾，並引導研究生未來研究之方向，課程內容包括：(1)闡述反芻動物生態系統，植物—微生物—動物交互作用與飼養策略(2)飼料作物化學(3)瘤胃功能與微生物學(4)後瘤胃之吸收與代謝(5)後腸發酵。

Herbivores

The objectives of this course are introducing the biology of the ruminant ecosystem, pointing out the problems and unsolved puzzles in the system, and addressing the potential research direction for the entry-level graduate students. Course contents include description of ruminant ecosystem, plant-microbe-animal interaction and feeding strategy; forage chemistry; rumen function and microbiology; post-ruminal absorption and metabolism of host animal; and hindgut fermentation

146040 畜產污染防治與資源利用 2 選

未定, 下

本課程目的在於介紹現存畜牧廢水處理系統，尋求經濟可行且因地制宜之系統，畜產廢棄物之減量與環境影響評估，畜產廢棄物之資源化利用，未來環保畜舍之評估，進而朝向清潔生產之目標，以達到畜牧永續經營之目的。

146040 Livestock Pollution Control and 2 S

S

Resource Utilization

The objectives of this course include to introduce the present animal wastewater treatment system, to pursue economical and flexible system, animal waste minimization and environmental impact assessment, the resource utilization of animal waste, future environment-friendly housing setup, animal cleaner production and to reach the goal of sustainable animal industry.

146041 動物複製學實習

1 選

沈朋志 上

本課程主要提供學生對於動物複製相關實驗之基本操作。課程內容包括：胚之培養與操作、受核卵母細胞之體外生產、供核細胞之製備及冷凍保存、受核卵母細胞之去核操作、供核細胞之注入、複製胚之電融合與激活處理。

146041 Animal Cloning Lab

1 S

P. C. Shen

F

This course is to offer students about the basic practice of animal cloning. The contents of the basic practice include: culture and manipulation of embryos, *in vitro* production of recipient oocytes, preparation and cryopreservation of donor cells, enucleation of recipient oocytes, microinjection of donor cells, cell fusion and activation of cloned embryos.

動物科學與畜產系 Department of Animal Science

課程代號 Course Number	科目名稱(中 文) Course (Chinese)	學分 Credit	科目名稱(英 文) Course (English)	頁次 Page
專業必修科目 Required Courses				
146001	專題討論	4	Seminar	
專業選修科目 Elective Courses				
146002	動物試驗設計	2	Experimental Designs for Farm Animals	
146003	應用畜產微生物	2	Applied Microbiology in Animal Science	
146004	動物科學文獻選讀	2	Literature Studying	
146005	專技英文寫作	2	Scientific Writing in English for Chinese Authors	
146006	科學論文寫作	2	Thesis Writing	
146007	高等生物統計學	2	Advanced Biometry	
146008	細胞生物學特論	2	Advanced Cell Biology	
14609	生物技術特論	2	Special Topics on Biotechnology	
146010	動物複製學	2	Animal Cloning	
146011	動物生殖生理特論	2	Special Topics on Animal Reproductive Physiology	
146012	泌乳生理學	2	Physiology of Lactation	
146013	經濟動物繁殖管理特論	2	Special Topics on Farm Animal Reproductive Management	
146014	線性模式與育種	2	Linear Model and Breeding	
146015	數量遺傳與動物模式論	2	Quantitative Genetics and Animal Model Methodology	
146016	遺傳參數估計	2	Estimation of Genetic Parameters	
146017	應用生物資訊學	2	Applied Bioinformatics	
146018	動物基因轉殖特論	2	Special Topics on Animal Transgenics	
146019	家畜營養生理	2	Special Topics on Animal Nutritional Physiology	
146020	消化道生理	2	Digestive Physiology	
146021	動物代謝調節	2	Animal Metabolic Regulation	
146022	生長發育學	2	Growth and Development	
146023	分子營養學	2	Molecular Nutrition	
146024	環境溫度與禽畜生產	2	Environmental Temperature and Livestock Production	
146025	飼料技術特論	2	Special Topics on Feed Manufacture Technology	
146026	機能性畜產品生產	2	Production of Functional Animal Products	
146027	種禽營養與飼養管理	2	Nutrition and Management of Poultry Breeders	
146028	安全畜產品生產特論	2	Special Topics on Safe Animal Production	
146029	畜產經營特論	2	Special Topics on Livestock Production	

Management				
課程代號 Course Number	科目名稱(中文) Course (Chinese)	學分 Credit	科目名稱(英文) Course (English)	頁次 Page

專業選修科目 Elective Courses

146030	乳品化學	2	Dairy Chemistry	
146031	肉品化學	2	Chemistry of Meat Tissue	
146032	乳品加工特論	2	Special Topics on Milk Products Processing	
146033	肉品加工特論	2	Special Topics on Meat Products Processing	
146034	畜產品品質管制	2	Quality Control of Animal Products	
146035	蛋品加工特論	2	Special Topics on Egg Product Processing	
146036	禽畜副產物利用	2	Utilization of Animal and Poultry Byproducts	
146037	加工副原料之應用	2	Applying Additives to Processing of Animal Products	
146038	動物新產品開發方法論	2	Methodology of Animal Products Development	
146039	草食動物營養特論	2	Special Topics on Nutrition for Herbivores	
146040	畜產污染防治與資源利用	2	Livestock Pollution Control and Resource Utilization	

動物科學與畜產系

Department of Animal Science

一、必修科目 Required Courses

146001 專題討論

4 必 全系老師，上下

本課程旨訓練研究生對於與畜產科學或論文有關的題目，經由資料之收集、研讀與彙整，令學生從而習得相關之專業知識，並由之獲得資料之分析、歸納與邏輯思考、試驗設計與統計、數據分析與統整之能力。並藉由書面報告、口頭發表及討論之歷練，以培養學生之論文撰寫能力及口頭表達能力。

142001 Seminar

4 R Faculties, F, S

The purpose of this course is to give graduate students the trainings on searching information, reviewing references related to animal science or their research topics, therefore, the abilities on logical thinking, experimental design, data collection and analysis, results discussion. Students are required to select a topic in the field of animal science or that related to their thesis. Students must give oral presentation and dissertation.

二、選修科目 Selective Courses

146002 動物試驗設計

2 選 劉世華，下

本課程旨在介紹試驗設計於控制動物試驗誤差之有效應用，並伴隨著適當合理的統計分析法，應付不同形態與性質之資料。授課內容主要包括優良試驗法則、完全隨機設計、拉丁方設計、交叉設計、複因子設計、不均衡設計、巢式設計與變積分析等。

146002 Experimental Designs

2 S S.H. Liu, S

for Farm Animals

The aims of this course are to state the error control via optimum design and the application of robust statistical methodologies for various types of dataset from farm animal experiment. The main content covers the principles of good experiment, completely randomized design, Latin square design, change-over design, factorial design, unbalanced design, nested design and analysis of covariance.

146003 應用畜產微生物**2 選****林美貞，上**

本課程討論微生物資源運用、發酵產品生產以及防治有害微生物的原理和方法。內容包括菌種選育、微生物發酵、發酵食品、食品污染與腐敗、食品保存與微生物管制等，並討論畜產相關微生物之最新資訊。

146003 Applied Microbiology**2 S****M. J. Lin, F****in Animal Science**

This course discusses the utilization of microbiological resources, the production of fermented products and prevention of pathogenic and spoilage microorganisms. The content of this course includes culture selection, fermentation, fermented foods, food contamination and spoilage, food preservation and microbiological control, and the new information of related subjects.

146004 動物科學文獻選讀**2 選****全系老師，上**

本課程將講授論文寫作與研究方法的基本架構、必要守則、及重要關鍵。透過研讀畜產科技中各種不同知識領域（遺傳育種、生理、營養、飼養、肉品和乳品加工）的中英文期刊論文，訓練研究生熟悉論文查詢、英文論文閱讀、科學論文的研究方法與寫作技巧。

146004 Literature Studying**2 S****Faculties, F**

This course will teach graduate students the basic structure, logic and important rules of both research methodology and scientific writing. It includes studying both Chinese and English published papers in various fields of animal science, including genetics, breeding, physiology, nutrition, feeding, meat processing and dairy processing. The aim of this course is to improve students' ability on paper searching, English literature studying, research techniques and scientific writing skills.

146005 專技英文寫作**2 選****林美貞等，上**

本課程旨在訓練研究生專業英文之寫作，本課程將針對國人於英文科學論文寫作易有之用詞錯誤、文法錯誤及邏輯編寫錯誤加以探討。期望研究生於修習本課程後，具備撰寫論文英文摘要之能力。

English for Chinese Authors

This course will be emphasis on writing. After successfully completing this course, the student will have obtained confidence and new skills to write scientific English sentences without serious grammatical errors, avoid errors in English that are most common to Chinese authors, prepare a summary in English of a scientific paper in Mandarin, plan and organize a research project and describe it in a scientific paper, and complete an effective resume for employment application.

146006 科學論文寫作

2 選

沈朋志、

林美貞，上

本課程旨在訓練研究生對相關論文查詢、資料蒐集、整理、引用及表達的能力。學生選擇論文有關的主題，蒐集文獻、閱讀、並將論文主題相關之試驗結果整理成摘要，提出報告並與共同討論。

146006 Thesis Writing

2 S

P.C. Shen,

M. J. Lin, F

This course is designed to train graduate students the ability in searching literature, organizing material and data, and presenting results. Students are required to select a topic in the field of those related to their thesis, search and review literature and draw up a brief.

146007 高等生物統計學

2 選

張秀鑾，上

課程主要目的在探討可應用於試驗與調查資料之統計分析方法，包括變異數分析、共變異數分析、單迴歸與複迴歸分析，以及卡方檢定；內容並針對所得資料變因之量化與推論可信度等方面進行探討。作業係以 SAS 統計套裝軟體為輔助工具。

146007 Advanced Biometry

2 S

H. L. Chang, F

Introduction to advanced statistical methods for analyzing experimental and survey data. Statistical methods covered will include analysis of variance, analysis of covariance, simple and multiple linear regression, and Chi-square tests. Course emphasis on quantifying sources of variation and making inference from data collected. These assignments will involve mainly making informative inference via SAS package.

146008 細胞生物學特論

2 選

余祺，上

此課程的設計是介紹細胞的重要功能，針對細胞的結構、胞器的功能及生長

過程、DNA 的表現、RNA 的修飾成熟、蛋白質的合成、包括癌症細胞的發生原因免疫細胞及免疫球蛋白的分化機制等，可作為從事研究生物科技、生物醫學、基因轉殖等相關研究基礎。

146008 Advanced Cell Biology 2 S C. Yu, F

This course is an extensively presentation of the molecular cell biology, Lectures including cell nucleus, cytoplasmic membrane systems, the control of gene expression, RNA splicing, protein synthesis and trafficking, mechanism of tumor cells and immune response.

146009 生物技術特論 2 選 沈朋志，下

本課程內容一方面介紹 DNA 抽取、限制酵素切割、DNA 片段增殖、DNA 序列分析及 PCR 技術。另方面將介紹生殖細胞體外調控技術、胚顯微操作、基因轉殖及動物複製技術，以及功能性基因體分析技術。

146009 Special Topics on Biotechnology 2 S P. C. Shen, S

The course emphasizes two main subjects. One subject includes extraction of DNA, restrict enzyme function, DNA replication, DNA fragment analysis and PCR technique. The other subject includes germ cell, embryo manipulation and transgenic or cloning animal producing methods and the techniques of functional genomic analysis.

146010 動物複製學 2 選 沈朋志，上

本課程主要目的乃希望結胚胎學，胚顯微操作技術與銘印基因表現調控理論，讓學生了解動物複製的基本知識及其於農業及醫學之應用層面，進而提供他們未來能於生物科學領域之相關研究，得以更進一步的探究。

146010 Animal Cloning 2 S P. C. Shen, F

The purpose of this course aims to combine the embryology, the technique of embryo micromanipulation and the regulation of imprinting gene for the students to understand the principle and knowledge of animal cloning and its application in agriculture and Medical science. Several techniques pertaining to bioscience will also be discussed to strengthen the students with the ability for future advanced studies.

146011 動物生殖生理特論 2 選 沈朋志、
劉炳燦，上

由於動物生殖現象存有相當程度之變化，本課程將試著引導學生充分了解一般共同生殖要點及各動物生殖細節之不同，並著重生殖技術方法之介紹，使學生對哺乳動物生殖有全面認識。課程內容著重於性別、性腺功能、懷孕分娩；一般生殖技術；生物技術應用於生殖。

146011 Special Topics on Animal 2 S P. C. Shen, B. T. Liu, F

Reproductive Physiology

A lot of variation in the reproduction is observed amongst different species. The objection of this course attempt to discuss the general fundamental facts and details differ on reproductive events for students can take a whole picture on mammalian reproduction. We also emphasize to introduce the research or farm practice technique on reproduction. Course contents include: Sex, gland function and pregnancy and parturition; Basic reproductive technique; Modern biological technique on reproduction.

146012泌乳生理學 2 選 劉炳燦，上

本課程目的乃在探討與泌乳有關之生理因子，內容包括：牛乳生合成及細胞分泌機制、內分泌對乳腺及泌乳之影響、營養因子對泌乳之影響、環境因子對泌乳之影響、生物技術應用於泌乳、及乳房炎及其預防。

146012 Physiology of Lactation 2 S B. T. Liu, F

This course is intended to review and discuss the physiological factors on lactation. Course contents include biosynthesis and cellular secretion of milk, endocrine control of mammary gland and lactation, nutritional aspects of lactation, environmental aspects of lactation, biotechnology on lactation, and mastitis and the defense system.

146013經濟動物繁殖管理特論 2 選 劉炳燦，上

本課程係以文獻檢討之方式，介紹近年來在家畜繁殖技術方面之進展。課程內容包括：發情與配種之人工控制，包括發情同期化及排卵時間之控制；季節性繁殖家畜之季節外配種控制，特別是在綿羊與山羊；家畜胚之體外生產技術，包括卵母細胞之體外成熟、體外受精及受精卵體外培養至囊胚階段；家畜精液與胚之冷凍保存技術，由傳統慢速冷凍發展至玻璃化冷凍；精子與胚之性別鑑定，包括 flowcytometry 與 PCR 技術之應用；胚操作與移置相關技術；家畜之複製，以細胞核移置及複製後之相關問題為主。

Reproductive Management

This subject provides the introduction of the progress on reproductive technology in farm animals in recent years through reference reviewing. The contents of the subject includes: Artificial control of estrus and breeding, including estrus synchronization and control of ovulation timing. Control of breeding in seasonal breeders out of season particularly in sheep and goat. Production of embryos in vitro including maturation and fertilization of oocytes, and culture of embryos until blastocyst stage. Cryopreservation of semen and embryos, development of vitrification method out of conventional slow freezing method. Sexing of spermatozoa and embryos including the application of flowcytometry and PCR techniques. Manipulation and transplantation of embryos. Cloning of farm animals mainly the nuclear transfer and associated problems after cloning.

146014 線性模式與育種

2 選

張秀鑾, 下

本課程主要目的在探討線性統計模式之一般估計量與統計假說之檢定，及其於遺傳育種之應用。內容除著重於統計育種之理論基礎外，尚包括應用矩陣代數於線性模式之統計分析與 SAS 電腦套裝軟體之理論背景闡釋，建立統計分析正確理念與提升學生應用 SAS 系統之純熟能力。

146014 Linear Model and Breeding

2 S

H. L. Chang, S

The aims of this course will be emphasis on the study of the general estimation problems and test the testable hypothesis for linear statistical model, and thus applied to the genetic and breeding aspects. In addition to theory of statistical breeding, topics will cover useful matrix algebra for linear model methodology and statistical insights of SAS package, and thus enhance the students' ability when the statistical package employed.

146015 數量遺傳與動物模式論

2 選

張秀鑾, 上

課程旨在延伸線性統計模式與分析方法之應用，主要著重於應用動物模式於畜產動物遺傳評估與選種策略之整合應用。內容包括動物模式介紹、種畜禽關係係數與近親係數估計、動物模式延伸、多性狀動物模式與非累加遺傳模式建立與應用。

146015 Quantitative genetics and

2 S

H. L. Chang, F

animal model methodology

This graduate course is intended to extend the application of linear statistical models and methods in the genetic evaluation and selection strategy for farm animal with focus on animal

model methodology. Course content includes animal model introduction, estimation of relationship and inbreeding coefficients, animal model extension, multiple traits animal model and non-additive genetic model building and application in farm animal selection program.

146016遺傳參數估計

2 選

張秀鑾，下

課程目的在使學生熟悉遺傳評估用之各項遺傳參數定義與性質，使其能正確應用於經濟動物改良實務面。授課內容包括畜產動物間親屬共變方、重要經濟性狀相關、變方估計法、遺傳變變方估計與應用。

146016 Estimation of genetic

2 S

H. L. Chang, S

parameters

The objectives of this course are to provide an understanding of genetic parameters including definition, attributes and application in selection program for animal industry. Material covers covariance between relatives, correlations among economical important traits, estimation methodology for variances, and evaluation of genetic parameter estimator, as well as the potential practiced in production level.

146017應用生物資訊學

2 選

劉世華，上

本課程旨在透過序列分析與電腦運算方式闡釋，使學生瞭解蛋白質功能表現與生物性狀之關係，培養學生熟悉生物資訊庫之搜尋程序與資源應用技術。課程內容包括網路資源介紹、序列比對、分析與註解、應用軟體介紹與公開網站與資料庫搜尋。

146017 Applied Bioinformatics

2 S

S.H. Liu, F

The course is to explore the relationship between proteomic and biological traits via sequence analysis and computation protocols, and thus provides students with skillful techniques in both searching and resources application for bio-databases. Course content includes an introduction of web sites, skill in sequence alignment, analysis and annotation, useful software application, and public web and databases searching capability.

142018動物基因轉殖特論

2 選

沈朋志，下

本課程主要目的乃希望結合胚胎學，各種基因轉殖操作技術與基因表現調控理論，讓學生了解基因轉殖的基本知識及其於農業及醫學之應用層面，課程內容，包含受精卵收集處理與培養、標的基因之構築、基因轉殖方法、胚胎培養、胚移置、標的基因之鑑定、轉殖基因品系之評估、基因表現調控、生產基因轉殖

動物與人類醫藥用蛋白質。

142018 Specific Topics on

2 S

P. C. Shen, S

Animal Transgenics

The purpose of this course aims to combine the embryology, the techniques of animal transgenics and the regulation of gene expression for the students to understand the principle and knowledge of animal transgenics and its application in agriculture and Medical science. The contents include: the collecting and culture of zygote, construction of target gene, introduce the techniques of animal transgenics, embryo culture, embryo transfer, identification of target gene, evaluation of transgenic lines, regulation of gene expression, production of transgenic animal and medicine protein for human.

146019家畜營養生理

2 選

謝豪晃, 上

本課程主要探討家畜營養與生理之關係，瞭解如何從營養觀點在維持正常健康之家畜，以及不適當的營養對家畜所造成之影響。課程內容包括：各種營養素之營養生理功能、討論各種動物之消化系及其營養生理、進一步探討不同生理功能及生理階段之特殊營養需要。

146019 Special Topics on Animal

2 S

H. H. Hsieh, F

Nutritional Physiology

The objectives of this course are: To discuss the relation between animal nutrition and physiology, To understand how to maintain animal health through nutrition, To address the influence of improper nutrition on animal production. The course contents include: The physiological functions of all nutrients, include carbohydrate, lipid, protein, vitamins and minerals, discussion on the digestive physiology of different animals and the roles in nutritional physiology, further discussion on the special nutritional needs in various physiological functions and phases.

146020消化道生理

2 選

余 祺, 上

本課程旨在探討動物消化腺所分泌之消化液、調節作用功能、對營養分之利用及保護動物體免受病菌感染之免疫機制。主要內容包括：消化道之解剖生理、消化器官之生長發育、消化液之分泌調控、養分消化吸收及排泄、腸道微生物、及腸道黏膜免疫機制。

146020 Digestive Physiology

2 S

C. Yu, F

The objective of digestive physiology is to introduce the digestive enzyme secretion, nutrient requirement and metabolism, and gastro-intestinal tract immunology. The major

concepts of this course include: anatomy of the gastro-intestinal tract, growth and development of the digestive system, regulation of digestive enzymes, digestion, absorption, and excretion of nutrients, microbiology of the gut, and immune response of intestinal mucosa.

146021 動物代謝調節

2 選

余 祺 , 下

本課程旨在探討動物各器官組織之營養分代謝及調控方式，以培養學生研習營養分代謝調節之相關課題能力。主要內容包括：腸道及血液內養分之運輸、營養素於肝臟之代謝、肌肉及腦之能量蛋白質代謝、脂肪組織、骨骼之養分代謝、腎臟代謝及電解質平衡。

146021 Animal Metabolic Regulation

2 S

C. Yu, S

The objective of this course is to discuss the metabolic regulation of different organs and tissues in farm animal. Students will familiar with the metabolic regulation of nutrients and apply the principle on their research. The main contents of this course include: transport properties in blood and gut, nutrients metabolism in liver, protein and energy metabolism in muscle, adipose tissue, nutrients metabolism in bone, kidney metabolism, and electron balance.

146022 生長發育學

2 選

夏良宙 , 上

本課程目的主要探討動物生長，瞭解生長後可用於育種、營養、肉品、生物工程等，其內容為：細胞發展與身體組成、生長控制機制、胚生長、骨骼生長發育、脂肪生長發育、肌肉生長發育、身體組成生長曲線、身體生長量測、生長遺傳控制、營養對生長之影響、激素對體組成之影響、環境對體組成之影響、肌肉量和質的關係、生長與性成熟。

146022 Growth and Development

2 S

L. C. Hsia, F

The purpose of the course is to study animal growth; consequently the knowledge can be applied to animal breed, nutrition, meat science, biotechnology production, etc. The content will include: Cellular development and body composition; Growth control mechanisms; Prenatal growth; Bone growth and development; Fat development and deposition; Muscle growth and development; Body composition and growth curves; Methods to measure body composition; Genetic regulation of growth; Influence of nutrition on body composition; Hormonal influence on body composition; Environmental influence on body composition; Relationship of muscle quality to quantity; Growth and sex maturity.

146023 分子營養學

2 選

余 祺 , 下

本課程旨在介紹分子營養學的發展及現今研究之幾種營養素對基因表達的影響，同時敘述基因多態性對部分營養物質之吸收、代謝及利用之作用。主要內容包括：代謝和基因調控、基因結構和基因表現、碳水化合物、蛋白質、脂肪對基因表達的調控、維生素及礦物質對基因表達之調節，及分子營養學之展望。

146023 Molecular Nutrition

2 S

C. Yu, S

The objective of this course is to introduce the development of molecular nutrition and up date information of nutrients on gene expression, and the function and metabolic pathways that the genes involved. The major concepts include: metabolism and regulation, gene structure and gene expression, carbohydrate on gene expression, protein on gene expression, lipids regulation, vitamins and gene expression, minerals and gene expression, and the perspective of molecular nutrition.

146024環境溫度與禽畜生產

2 選

夏良宙，上

本課程之目的在探討高環境溫度下，家畜禽生產所遇到的問題及解決之方法。課程內容包括，熱帶畜牧對動物生產之影響，環境之定義，溫度相關知識，溫度對生理之影響，溫度和營養之關係，高溫對豬之影響，高溫對牛之影響，高溫對羊之影響，高溫對種雞之影響，高溫對肉雞之影響，高溫對蛋雞之影響，高溫對其他動物之影響，高溫對牧草生產之影響。

146024 Environmental Temperature

2 S

L. C. Hsia, F

and Livestock Production

The purpose of this course is to study the effect of high environmental temperature on animal production, and how to solve the problems. The following topics included in the course. Animal production problem under tropical environment, environment, temperature, the effect of temperature on physiology, the effect of temperature on nutrition metabolism, the effect of high temperature on pigs, the effect of high temperature on cattle, the effect of high temperature on sheep and goat, the effect of high temperature on breed chicken, the effect of high temperature on broiler, the effect of high temperature on layer, the effect of high temperature on other animal, the effect of high temperature on forage grass.

146025飼料技術特論

2 選

未定，下

本課程係討論禽畜飼料之最新科技，其內容包括：飼料原料中抗營養因子之去除技術、配合飼料之製造技術與品管、飼料配方設計技術、飼料科技之研發動向。

146025 Special Topics on Feed 2 S S

Manufacture Technology

This course will discuss the modern science and technology of livestock feeds, which contains: Disjoin techniques on anti-nutrient factor of ingredient feeds; The processing and quality control of formular feeds; Design technique of livestock feed formulation; The research advancement of feeds science and technology.

146026 機能性畜產品生產 2 選 鄭長義，上

本課程主要係探討各種機能性畜產品之生產技術，課程內容包括：機能性畜產品之市場現況、機能性畜產品之機能作用、免疫抗體之機能作用、雞蛋中生物活性物質之機能作用、機能性畜產品之生產技術(包括機能性蛋品、肉品及乳品等)。

146026 Production of Functional 2 S C. Y. Cheng, F

Animal Products

The purposes of this course are to studies the production technology of functional animal products, which contains introduction on the currents situation of the production and marketing for functional animal products, the function of functional animal products, the function of immunoglobulin yolk (IgY), the function of active material in egg, the production technology of functional animal products of egg, meat and milks.

146027 種禽營養與飼養管理 2 選 謝豪晃，下

本課程旨在使學生瞭解種禽的營養與飼養管理相關知識。主要內容包括育種、孵化管理、飼養技術、雞舍設備、飼料配方、及種禽種蛋生產效益。

146027 Nutrition and Management 2 S H. H. Hsieh, S

of Poultry Breeders

The objective of this course is to introduce the advanced theory and practical operation technique of poultry breeders to students. The contents include: poultry breeding, incubation and hatchery management, brooding and rearing, houses and equipment, feed ingredients and nutrient requirement, marketing eggs, and marketing poultry.

146028 安全畜產品生產特論 2 選 未定，下

本課程旨在探討抗生素造成之問題及取代抗菌藥物之畜產品生產。主要內容包括無藥物殘留畜產品介紹、取代抗菌藥物之物質與安全性畜產品、及無菌無污

染之畜產品加工製成。

146028	Special Topics on Safe	2	S	S
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Animal Production

Current topics in safe animal production will be discussed, with special emphasis on the problems of antibiotic residues, the various species of antibiotic replacers, and the production of free contamination safe animal products.

146029 畜產經營特論 2 選 未定, 下

本課程乃系統性地介紹畜產經營應具備之技能，包括：畜產企業管理學內涵、不同評價之成本項目與效益分析、畜產企業經營規劃與決策、畜產企業行銷、資料收集與分析、畜產企業政策與環保問題、預測方法、畜產企業組織、畜產企業產品生產與規劃、人力資源、畜產企業資金與預算、畜產企業控制原則、畜產企業成本與收益觀念、畜產企業經營目標之設計。

146029	Special Topics on Livestock	2	S	S
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Production Management

This course gives a systematic knowledge for livestock production manager. It includes the contents as livestock business, cost evaluation and benefit analysis, planning and decision, livestock business marketing, information collection and analysis, policy and ecosystem protection, forecasting, livestock business organization, products and production planning, manpower resources, capital and budget, controlling, cost and revenue, and management indicators.

146030乳品化學 2 選 林美貞, 上

本課程討論原料乳及乳製品加工及儲存過程中之變化。課程內容包括供人類飲用之哺乳動物乳汁之組成與物理化學特性；各式乳與乳製品於加工過程中各種化學變化及重要機制；微生物發酵之理化變化；以及貯存期間乳與乳製品品質之變化。

146030 Dairy Chemistry 2 S M. J. Lin, F

This course discusses the changes of raw milk and dairy products during processing and storage. The content of this course includes the composition and physical-chemical properties of milk from various domestic mammals; chemical changes and mechanisms of dairy products during processing; physical-chemical changes of milk during fermentation; and the changes of quality of dairy products during storage.

146031 肉品化學**2 選****未定，上**

本課程著重於肉品之組成、性質以及肉品加工、貯藏過程中之變化。內容包含：脂肪、蛋白質、酵素、碳水化合物、灰分、維生素與水之結構、物理化學特性，肉色，酸鹼度，肉品加熱與冷卻之方法與影響等。

146031 Chemistry of Meat Tissue**2 S****, F**

This course focuses on the composition, characteristics, and changes of meat and meat products during processing and storage. Also, the structures, physic-chemical properties of lipids, proteins, enzymes, carbohydrates, ash, and vitamins are also addressed. Meat colors, pH, influences caused by heating and cooling are also covered.

146032 乳品加工特論**2 選****林美貞，下**

本課程討論乳製品加工及儲存方法與條件對乳與乳製品品質之影響。課程內容包括供人類飲用之哺乳動物乳汁之組成與差異性；各式乳與乳製品原料之應用、處理與儲存；加工技術之原理與方法；以及加工處理及貯存條件，對乳製品理化及風味品質之影響。

146032 Special Topics on Milk**2 S****M. J. Lin, S****Products Processing**

This course discusses the effects of processing methods and storage condition on the quality of milk and dairy products. The content of this course includes the variation of milk composition from various domestic mammals; storage, processing and application of raw milk; technical procedures involving producing various dairy products; and the effects of processing and storage conditions on the physical-chemical and sensory properties of dairy products.

146033 肉品加工特論**2 選****未定，下**

本課程著重於肉品加工過程中技術、化學與微生物間之相關，使學生充分了解肉品科學之關聯性。

146033 Special Topics on Meat**2 S****, S****Products Processing**

This course set in the context of the concepts of technology, chemistry and microbiology of meat manufacturing processing, provide a full comprehensive understanding of meat science.

146034 畜產品品質管制**2 選****未定，上**

本課程主要討論畜產品之品質管制與衛生，家畜健康對畜產品品質的關係。主要內容包括屠前家畜的處理，肉品工廠中肉品管理，肉品處理與肉品工廠清潔。集乳與授乳衛生，乳品一般處理及品質測定。

146034 Quality Control of Animal**2 S****, F****Products**

This course will discuss the quality control, sanitation and inspection of animal products, animal health in relation to the quality of animal products. The major chapter contents transportation and handling of livestock prior to slaughter, meat inspection, handling of meat, quality control of meat and meat plant cleaning, collection and reception of milk, general milk treatment, quality control of milk and milk products.

146035 蛋品加工特論**2 選****未定，上**

本課程就蛋之利用以及過去與未來各式蛋製品之加工趨勢，分別就蛋之化學性狀，非食品類之利用，營養與功能性之修飾或蛋製品之設計等之技術等加以廣泛討論。

146035 Special Topics on**2 S****F****Egg Products Processing**

The course discuss wide range of egg uses and processing technologies including current and future world tends, separation technologies for egg chemicals properties, non-food uses, functional and nutritional modification or designing of egg products.

146036 禽畜副產品利用**2 選****未定，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

146036 Utilization of Animal**2 S****S****and Poultry Byproducts**

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, fater, dairy, and egg byproducts will also be addressed. Finally,

uses of these byproducts in food processing, industries, and medical application will also be included.

146037 加工副原料之應用 2 選 林美貞，下

本課程討論畜產加工領域中除乳、肉及蛋以外之副原料之應用及原理。內容包括乳品、肉品及蛋品加工中常用之添加劑；營養強化物質及機能性成分物質之添加；食品添加物使用規範及相關法規；及畜產品作為其他食品產業副原料之應用。

146037 Applying Additives to 2 S M. J. Lin, S

Processing of Animal Products

This course discusses the application and principle of applying additives to animal products processing. The content of this course includes common additives of dairy, meat and egg processing; addition of nutrient fortification and functional ingredients; regulation of additives usage; and application of animal products on food industry.

146038 動物新產品開發方法論 2 選 林美貞，上

本課程討論動物產品研發之流程、方法及整體評估方式。內容包括新產品設計、市場評估法、成本分析、風險評估、研發方法、製程調整及製造、產品包裝、相關法規及規範、專利及智慧財產權、動物新產品開發方向及趨勢。

146038 Methodology of Animal 2 S M. J. Lin, F

Products Development

This course discusses the developing procedures and evaluating methodology of new animal products. The content of this course includes designing new products, consumer research, prototype development, financial evaluation, risk analysis, technical plan, other R&D methodology, manufacturing, food packaging, safety and regulation, protection of intellectual property, and focal issue in animal science and food science.

146039 草食動物營養特論 2 選 未定，上

本課程之目的在於介紹反芻動物生態系統之生物學，並探討此系統之問題與無法解決之困擾，並引導研究生未來研究之方向，課程內容包括：(1)闡述反芻動物生態系統，植物—微生物—動物交互作用與飼養策略(2)飼料作物化學(3)瘤胃功能與微生物學(4)後瘤胃之吸收與代謝(5)後腸發酵。

Herbivores

The objectives of this course are introducing the biology of the ruminant ecosystem, pointing out the problems and unsolved puzzles in the system, and addressing the potential research direction for the entry-level graduate students. Course contents include description of ruminant ecosystem, plant-microbe-animal interaction and feeding strategy; forage chemistry; rumen function and microbiology; post-ruminal absorption and metabolism of host animal; and hindgut fermentation

本課程目的在於介紹現存畜牧廢水處理系統，尋求經濟可行且因地制宜之系統，畜產廢棄物之減量與環境影響評估，畜產廢棄物之資源化利用，未來環保畜舍之評估，進而朝向清潔生產之目標，以達到畜牧永續經營之目的。

Resource Utilization

The objectives of this course include to introduce the present animal wastewater treatment system, to pursue economical and flexible system, animal waste minimization and environmental impact assessment, the resource utilization of animal waste, future environment-friendly housing setup, animal cleaner production and to reach the goal of sustainable animal industry.

植物醫學系 Department of Plant Medicine

課程代號 Course Number	科目名稱(中文) Course (Chinese)	學分 Credits	科目名稱(英文) Course (English)	頁次 Page
專業必修科目 Required Courses				
152001	普通昆蟲學	2	General Entomology	
152002	普通昆蟲學實習	1	Practice of General Entomology	
152003	作物栽培	2	Crop Cultivation	
152004	作物栽培實習	1	Practice of Crop Cultivation	
152005	植物病原細菌學	2	Phytopathogenic Bacteriology	
152006	植物病原真菌學	2	Phytopathogenic Fungi	
152007	土壤與肥料	2	Soil and Fertilizer	
152008	植物生理學	2	Plant Physiology	
152009	昆蟲生態學	2	Insect Ecology	
152010	植物病毒學	2	Plant Virology	
152011	植物線蟲學	2	Plant Nematology	
152012	生物化學	2	Biochemistry	
152013	生物化學實習	1	Practice of Biochemistry	
152014	昆蟲分類學	2	Insect Taxonomy	
152015	雜草管理	2	Weed Management	
152016	雜草管理實習	1	Practice of Weed Management	
152017	植物醫學技術實習	1	Practice of technique of plant medicine	
152018	遺傳學	2	Genetics	
152019	農業昆蟲學	4	Agricultural Entomology	
152020	農業昆蟲學實習	2	Practice of Agricultural Entomology	
152021	植物病理學	4	Plant Pathology	
152022	植物病理學實習	2	Practice of Plant Pathology	
152023	農業藥劑學	2	Pesticide	
152024	農業藥劑學實習	1	Practice of Pesticide	
152025	植物非生物性病害	2	Abiotic Disorders of Plant	
152026	螨蟎學	2	Acarology	
152027	植物病害診療實習(果樹病害)	1	Practice of Diagnosis and Management of Plant Disease on Fruits	
152028	植物病害診療實習(蔬菜病害)	1	Practice of Diagnosis and Management of Plant Disease on Vegetables	
152029	植物蟲害診療實習(果樹蟲害)	1	Practice of Diagnosis and Management of Insect Pests on Fruits	
152030	植物蟲害診療實習(蔬菜蟲害)	1	Practice of Diagnosis Management of Insect Pests on Vegetables	
152031	植物病害診療實習(糧食作物病害)	1	Practice of Diagnosis and Management of Plant Disease	

			on Food Crops	
152032	植物病害診療實習(觀賞植物病害)1		Practice of Diagnosis and Management of Plant Disease on Ornamental Plants	
152033	植物蟲害診療實習(糧食作物蟲害)1		Practice of Diagnosis and Management of Insect Pests on Food Crops	
152034	植物蟲害診療實習(觀賞植物蟲害)1		Practice of Diagnosis and Management of Insect Pests on Ornamental Plants	
152035	植物醫學田野實習	8	Field Study of Plant Medicine	

課程代號 Course Number	科目名稱(中文) Course (Chinese)	學分 Credite	科目名稱(英文) Course (English)	頁次 Page
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專業選修科目 Elective Courses

152036	微生物學	2	Microbiology	
152037	微生物學實習	1	Practice of Microbiology	
152038	園藝學	2	Horticulture	
152039	園藝學實習	1	Practice of Horticulture	
152040	植物分類學	2	Plant Taxonomy	
152041	植物分類學實習	1	Practice of Plant Taxonomy	
152042	植物組織培養學	2	Plant Tissue Culture	
152043	植物組織培養學實習	1	Practice of Plant Tissue Culture	
152044	有害動物	2	Noxious Animals	
152045	資源昆蟲	2	Insects Resources	
152046	農業氣象學	2	Agricultural Meteorology	
152047	昆蟲形態學	2	Insect Morphology	
152048	食用菌栽培技術	2	Edible Fungi Cultivation	
152049	昆蟲生理學	2	Insect Physiology	
152050	生物技術與植物醫學	2	Biotechnology and Plant Medicine	
152051	植保法規及檢疫	2	Plant Quarantine and Regulations	
152052	熱帶植物病蟲害	2	Pests and Diseases of Tropical Plants	
152053	生物防治	2	Biological Control	
152054	設施園藝病蟲害	2	Pests in Horticultural Structures	
152055	昆蟲病理學	2	Insect Pathology	
152056	農企業管理	2	Agribusiness Management	
152057	植物流行病學	2	Plant Disease Epidemiology	
152058	樹木病蟲害	2	Forest Pests	
152059	蟲害發生預測預報	2	Monitoring and Forecasting of Insect Pests	
152060	居家害蟲	2	Domestic Pests	

植物醫學系

Department of Plant Medicine

一、專業必修科目 Required Courses

152001 普通昆蟲學

2

必

張萃嫻、上

本課程主要介紹昆蟲學的基本知識，課程內容包括昆蟲形態、分類、生理及行為使學生能瞭解昆蟲及其與人類之關係；以提供從事昆蟲相關訓練之基本概念。

152001 General Entomology

2

R

T. Y. Chang, F

The objective of this course is to introduce basic knowledge of entomology. Lectures include morphology, physiology, systematics, development and behavior of insects. Students will get practical experience in identifying and managing insects for their professional careers.

152002 普通昆蟲學實習

1

必

張萃嫻、上

本課程主要介紹昆蟲採集及標本製作方法，由實物觀察瞭解昆蟲外部形態，內部構造，種類及行為等。

152002 Practice of General

1

R

T. Y. Chang, F

Entomology

The objective of this lab is to introduce the collection and preservation of insects. Learning external and internal structures of insects through examining fresh and preserved specimens. Using taxonomic keys to proficiently identify insects to the family level.

152003 作物栽培

2

必

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

152003 Crop Cultivation

2

R

The course is aimed at giving student a thorough understanding of the impacts of environmental factors and culture management technology on plant growth and development. Topics covered include the origin, classification, distribution of crops and their environmental requirements and cultural systems. Propagation,

fertilization, irrigation, pest management, disease control, and post-harvest techniques will be introduced about each individual crop.

152004 作物栽培實習

1

必

本課程係透過實地操作，使學生熟悉作物栽培之基本技能，諸如：作物種類及栽培方法之選定、農地整備、堆肥製作、生長管理、病蟲害及雜草防治實務等，使學生具備作物栽培之基本能力，並特別加強無農藥栽培技術之訓練，以建立未來從事清潔栽培或有機栽種之能力。

152004 Practice of Crop

1

R

Cultivation

The purpose of the course is to familiarize students with the basic farming techniques through hand-on field training, including the selection of crops and culture methods, land tilling, manure preparation, crop management, disease and weed control etc. Students will also enrich their knowledge and ability in clean culture and organic farming through the training of pesticide-free crop culture.

152005 植物病原細菌學

2

必

趙永椿、下

本課程主要在講授植物病原細菌的分類與鑑定，以及描述其所引起的病害種類。內容包括植物細菌性病害的基本診斷技術、病原細菌主要屬的區分方法、致病機制、病原細菌的遺傳與突變、噬菌體與細菌素、血清學及它們在植物病原細菌學上的應用、植物病原細菌的生態及植物細菌性病害的管理及防治、使學生在修完本課程後對植物病原細菌及其所引起的病害有更多的瞭解與認知。

152005 Phytopathogenic

2

R

Y. C. Chao, S

Bacteriology

The objective of this course is to introduce the taxonomy and identification of plant pathogenic bacteria and the descriptions of the diseases they cause. Contents include the basic techniques for diagnosing plant bacterial diseases, differentiation of the major genera of plant pathogenic bacteria, mechanisms of diseases induction, variation and genetics of plant pathogenic bacteria, bacteriophages and bacteriocin, serology and their application on phytopathogenic bacteria, ecology of phytopathogenic bacteria and control or management of bacterial plant diseases. The students will learn more knowledge about the phytopathogenic bacteria and the diseases they cause from this course.

152006 植物病原真菌學

2

必

梁文進、下

本課程乃以真菌類緣為主幹，分別描述下列真菌—(1) 黏菌綱 (2) 根瘤菌綱(3)

結合菌綱 (4) 卵菌綱 (5) 子囊菌綱 (6) 擔子菌綱 (7) 不完全菌綱的形態、生理、生殖、遺傳、分類、生態及其在農業、醫學及工業上的應用及影響。

152006 Phytopathogenic Fungi 2 R W. J. Liang, S

The course is to introduce the morphology, physiology, propagation, genetics, ecology, classification and the importance of each group of the fungi, which include: (1) Myxomycetes (2) Plasmodiophoromycetes (3) Zygomycetes (4) Oomycetes (5) Ascomycetes (6) Basidiomycetes and (7) Duteromycetes.

152007 土壤與肥料 2 必 許仁宏、陳光堯、下

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

152007 Soil and Fertilizer 2 R Z. H. Shū, K. Y. Chen, S

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

152008 植物生理學 2 必 古明萱、王均琍、
蔡秀隆、上

本課程在使學生獲得有關植物生理學之基本知識，課程內容包括植物生理之概念、植物之吸水及蒸散作用、礦物營養及養分之吸收輸送、光合作用、呼吸作用、氮素、脂質及其他二次代謝物之代謝。

152008 Plant Physiology 2 R M. S. Guu, C. L. Wang,
L. Tsai, F

The purpose of this course is to acquaint students with knowledge of basic principles and the application of plant physiology on the agricultural system. The contents include: Introduction of concepts in plant physiology, the process of water absorption and transpiration, absorption and translocation of mineral, nutrient, photosynthesis, respiration, metabolism of nitrogen, lipid and secondary metabolites.

本課程以生態學原理為基礎，針對影響昆蟲分布、豐度、生命史與演化的生物及非生物環境與昆蟲之交互作用，進行解說。本課程尤其強調昆蟲族群的消長、調節、及昆蟲於生態系能量流動中所扮的角色。

152009 Insect Ecology

2

R

N. T. Chang, F

This course is basing on the ecological principles and aimed at the interaction of insects with their biotic and/or abiotic environment as it influences their distribution, abundance, life history and evolution. The emphasis will be on population dynamics, regulations and the role of insects playing in energy flow of an ecosystem.

152010 植物病毒學

2

必

陳滄海、上

本課程除傳統植物病毒學範疇外，並涵蓋從分子層次討論植物病毒之構造，引起之植物病害，田間發生及防治，期能達到理論與實務並重；內容包括植物病毒分子層次的構造及核酸組成，病毒分離、鑑定與純化，在寄主體內之增殖及轉移，媒介傳播、遺傳及變異，其引起之病害及田間發生生態與防治。

152010 Plant Virology

2

R

T. H. Chen, F

The course will give conventional and molecular level of plant viruses in order to help the students to get much theoretical and practical knowledge about plant virology. The contents cover the molecular structure of virion and genome, virus isolation, identification and purification, transmission, variation, ecology, nomenclature and classification, diagnosis and control.

152011 植物線蟲學

2

必

鄭光哲、上

植物寄生性線蟲分類上屬於原形動物門，具假體腔，體形呈二側對稱，具有消化，生殖、神經系統，缺乏呼吸及循環系統。此類線蟲大多存活於土壤中，以寄主植物根圈附近族群密度較高，行絕對寄生危害植株根部，主要靠水流、土壤、介質、種苗及器具等傳播；少部分線蟲可危害植株地上部，並藉由種子或特定昆蟲媒介傳播。線蟲除可單獨危害寄主植物，尚可與其他病原微生物形成複合感染，造成更嚴重之經濟損失。

152011 Plant Nematology

2

R

K. C. Cheng, F

Plant parasitic nematodes are long tubular organisms that move over wet surfaces and feed on living plant cells. Most species found in soil are very small, about 0.2-2mm long and less 0.05mm wide should be observed by microscopes. Nematodes have digestive, reproductive and nervous systems, but no respiratory and circulatory systems. They parasite and inhabit all parts of plants, including buds, stems, leaves and roots, usually cause severe economic losses.

152012 生物化學**2****必****許祥純、上**

本課程主要介紹生物體構成分子之組成及結構，以提供學生生化分子之基本概念，並建立修習代謝生化及分子生物的基礎。其內容包括：水及緩衝溶液、胺基酸及蛋白質、酵素、核酸、碳水化合物及脂質之介紹。

152012 Biochemistry**2****R****S. C. Sheu, F**

This course is to introduce the composition and structure of biomolecules. The purpose of this course is to provide students with basic concepts of biomolecules for the further study of metabolism and molecular biology. The topics involved in this course are water and buffer, amino acid and protein, enzyme, nucleic acid, carbohydrate and lipid.

152013 生物化學實習**1****必****許祥純、上**

本課程目的在使學生藉由實際操作了解生化分子的特性及生化反應的原理，並學習 pH 計、分光光度計等儀器的操作。實習內容包括：緩衝溶液之製備、胺基酸之滴定、胺基酸及蛋白質之定性分析、蛋白質之定量、醣類之定量分析、酵素活性測定及膠過濾法。

152013 Practice of Biochemistry 1**R****S. C. Sheu, F**

This course is designed for students to understand the characteristics of biomolecules and the principles of biochemical reactions in the lab. Students also learn how to operate some instruments such as pH meter, spectrophotometer in this course. It includes buffer preparation, titration of amino acid, qualitative and quantitative analysis of amino acid and protein, quantitative analysis of carbohydrates, enzyme assay and gel filtration chromatography.

152014 昆蟲分類學**2****必****張萃嫻、下**

本課程主要介紹昆蟲綱各目的分類特徵及分類系統；課程內容包括昆蟲分類學之發展史、分類階層、昆蟲命名、昆蟲鑑定、特徵描述、模式標本、32 目各目之外表形態構造及其診斷鑑定特徵、分類系統及分類學說等。

152014 Insect Taxonomy**2****R****T. Y. Chang, S**

The objective of this course is to introduce taxonomic characters and phylogeny during each orders of Class Insecta. Lectures include the history, catalogue, nomenclature, identification, description, type specimen, external morphological characters of 32 orders, systematic, phylogeny and theory of entomo-taxonomy.

152015 雜草管理

2

必

鄭秋雄、下

本課程主要介紹雜草之認識、分類、鑑定、生理、生態及對作物、環境、人類之影響，繼而說明草害管理之演變及主要管理技術。主要內容包括雜草之起源、雜草之危害與利用、雜草之生理特性與生態、雜草防治、殺草劑之劑型、特性、殺草機制與施用方法。

152015 Weed Management

2

R

C. C. Cheng, S

This course is mainly to recognize weeds and introduce the classification, identification, physiology, ecology of weeds, effects on crops, environment and humanity, and instruct the evolution and management technologies of weeds. The main content includes the origin of weeds, the harm and use of weeds, the physiological characters and ecology of weeds, weed control, and the form, properties, weed control mechanism and use methods of herbicide.

152016 雜草管理實習

1

必

鄭秋雄、下

本實習主要介紹認識雜草及雜草生態相，進而了解各種雜草的管理技術，包括生物性、化學性殺草劑特性及應用。主要內容包括雜草形態、生理、生態環境之觀察、雜草分類、雜草標本製作及殺草劑之施用方法。

152016 Practice of Weed

1

R

C. C. Cheng, S

Management

The purposes of this course are to make students understand weeds and ecological distribution, and introduce each management technologies of weeds, which include the properties and application of biological and chemical herbicides. The main content includes the observations of morphology, physiology and ecology of weeds, weed classification, the manufacture of weed specimens and spray methods of herbicide.

152017 植物醫學技術實習

1

必

下

本實習旨在訓練學生有關植物病理學及昆蟲學的基本研究技術，內容包括相關文獻蒐集、利用及論文寫作。培養基之製作、無菌操作技術、病原菌的分離及培養、病害診斷技術、病害的接種及感染、病原菌的保存、田間取樣技術、病害防治技術以及昆蟲飼育、採集標本製作、顯微鏡操作及種類鑑定等。

152017 Practice of technique

1

R

S

of plant medicine

This course provides the students with the basic methodology for plant pathological and insect pest studies. The contents includes the literature search and writing skill for research paper. Media preparation and utilization, disinfection and sterilization technique, isolation of plant pathogen, establishment of disease,

preservation of plant pathogens as well as the disease management methods、insect rearing, collecting, mounting, microphotography and identification.

152018 遺傳學

2

必

陳福旗、陳幼光

吳文雄、下

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

152018 Genetics

2

R

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

W. H. Wu, S

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

152019 農業昆蟲學

4

必

張萃嫻、上、下

本課程主要介紹昆蟲與農業的關係，瞭解重要農業害蟲之分類地位、形態特徵、生活習性、發生生態、危害狀況、經濟重要性及其防治方法，並介紹綜合防治之原則與實施方法。

152019 Agricultural Entomology

4

R

T. Y. Chang, F, S

This course deals with the relationships of major agricultural insect pests and their crop damaged. For each pest insect, its morphological character, life cycle, seasonal occurrence, injury and damage, economic importance as well as the methods of control are introduced. The strategies and tactics of integrated pest management are also discussed.

152020 農業昆蟲學實習

2

必

張萃嫻、上、下

本課程主要包括認識各主要作物之害蟲與其為害徵狀、害蟲之族群消長調查方法、為害損失估算及主要防治方法，使學生實際認知當前重要作物之主要害蟲，及其抑制的方法。

152020 Practice of Agricultural

2

R

T. Y. Chang, F, S

Entomology

This course includes the introduction of pests and their damages of major crops in Taiwan. The identification, methods to study the population dynamics, analysis

of loss and damage of host plant, and the management methods of pest insects on various major crops, for example rice, wheat, fruit, vegetables, flower etc., are emphasized.

152021 植物病理學

4

必

陳滄海、上、下

本課程討論非生物性因素及生物性因素(如毒素、類病毒、原核性細菌、菌質、真菌、高等寄生植物、線蟲、原生物等)造成作物病害之原理，說明寄主與病原間之相互關係，病變過程、致病作用機制，及植物抗病之原理。同時闡明環境因素與病勢發展之關係，繼而以田間主要作物病害、花卉病害、蔬菜病害、果樹病害及溫室病害分別說明，並配合防治原理，討論其防治方法。

152021 Plant Pathology

4

R

T. H. Chen , F , S

The major contents of this course is to discuss the abiotic and biotic factors (including viruses, viroids, prokaryotic bacteria, mollicutes, fungi, parasitic higher plants , nematodes and protozoa) that caused crop diseases. The host-pathogen interaction relationship, pathogenesis, pathogenicity, and mechanisms of plant defense systems are explained in cases. The environmental factors influencing diseases development reveal the knowing of disease principles. The most important diseases of field crops, ornamental plant, fruit trees, vegetable and greenhouse plants would be discussed implicated with the principles of disease management.

152022 植物病理學實習

2

必

陳滄海、上、下

本實習主要包括病原之分離、培養、鑑定及接種等技術。由田間之採集病害標本進行診斷，判斷病因及確立病害種類之技術方法及相關技術，並以病害診斷及使用農藥之專家系統電腦程式教導學生，如何應用個人電腦作為作物病害診斷與防治之工具。本課程亦注重病害之病變過程之變化，病徵之認識，病組織之解剖等組織觀察技術。

152022 Practice of Plant

2

R

T. H. Chen, F , S

Pathology

The major objectives of this lab. are to let student familiar with pathogen isolation, culture, identification, and inoculation techniques for disease diagnosis and chemicals application compiled in personal computer or would be applied for student uses. The micro-observation techniques are also used for disease' s tissue anatomy, symptom classification and disease development are also instructed to students.

152023 農業藥劑學

2

必

辛竹英、上

介紹殺蟲劑、殺菌劑、除草劑及其他農藥的特性，劑型及作用機制，並討論農藥

使用後對人畜，作物及環境的影響。

152023 Pesticide 2 R C. Y. Hsin, F

Managerial, physiological and ecological effects of chemicals applied to crops and soils. Includes insecticides, fungicides, herbicides and other pesticides. Types of formulations, proper application, safety, environmental aspects and historical aspects are covered.

152024 農業藥劑學實習 1 必 辛竹英、上

介紹各種毒性測試方法，製劑，正確噴藥方法，安全用藥，標籤製作及農藥殘量分析方法等。

152024 Practice of Pesticide 1 R C. Y. Hsin, F

Introduce different kinds of toxicity test, formulation, calibration, safe use of pesticides, labeling and pesticide residue analysis. Working in the experimental farm to get practical experience in conducting toxicity trials in the field.

152025 植物非生物性病害 2 必

課程內容涵蓋植物對於環境中各種非生物性因素的影響產生的變化，諸如各種氣象，營養生理，藥害及環境脅迫如污染對植物產生傷害及產量的變化，討論各種因素的為害特性，病因鑑定與各種因應措施，利用不同的策略與方法改善植物生長。

152025 Abiotic Disorders of Plant 2 R

Categories in this course are plants affect by abiotic factors, concerned climate injury, poor or excess nutritions, pesticide's injury, environmental stress especially in pollutions, the characteristic of different abiotic factors, diagnosis and suitable control methods.

152026 蟎蟬學 2 必 華 真、下

本課程主要介紹蟎蟬的外部形態、內部構造、族群生態及重要蟎蟬之分類，與植食性蟎類對作物所引起之為害特徵，及經濟有效的綜合管理方法。

152026 Acarology 2 R T. Hua, S

The objective of this course is to introduce basic knowledge of the Acari, Major content includes the morphological characteristics, population ecology, injury and damage, economic importance as well as the control methods of the Acari, under the principle of integrated pest management.

152027 植物病害診療實習**1****必****上****(果樹病害)**

本實習課程內容主要有果樹病害診斷技術之介紹及訓練，包括病徵診斷，解剖診斷，病原分離培養接種及鑑定，生理生化診斷，生物診斷，免疫診斷與核酸診斷技術。及介紹果樹病害之計量及損失評估，防治原則，各種防治方法包括化學防治法、生物防治法、耕作防治法、物理防治法、法規防治法及經濟有效的綜合管理策略。

152027 Practice of Diagnosis**1****R****F****Management of Plant****Disease on fruits**

The objectives of this course are focused on (1)introduction and training of diagnostic techniques of fruits plant disease, which include symptomatic diagnosis, anatomic diagnosis, isolative and identification of pathogens, biochemical and physiological method, biological method, immunological diagnosis and nucleic acid techniques. (2)introduction of loss assessment, epidemiology, principles and practical control measures including chemical control, biological control, cultural control, physical control and quarantine control and the integrated disease management of fruits plant disease.

152028 植物病害診療實習**1****必****上****(蔬菜病害)**

本實習課程內容主要有蔬菜病害診斷技術之介紹及訓練，包括病徵診斷，解剖診斷，病原細菌之分離培養接種及鑑定，生理生化診斷，生物診斷，免疫診斷與核酸診斷技術。及介紹蔬菜病害之計量及損失評估，防治原則，各種防治方法包括化學防治法、生物防治法、耕作防治法、物理防治法、法規防治法及經濟有效的綜合管理策略。

152028 Practice of Diagnosis**1****R****F****Management of Plant****Disease on vegetables**

The objectives of this course are focused on (1)introduction and training of diagnostic techniques of vegetables plant disease, which include symptomatic diagnosis, anatomic diagnosis, isolative and identification of pathogens, biochemical and physiological method, biological method, immunological diagnosis and nucleic acid techniques. (2)introduction of loss assessment, epidemiology, principles and practical control measures including chemical control, biological control, cultural control, physical control and quarantine control and the integrated disease management of vegetables plant disease.

152029 植物蟲害診療實習 1 必 上
(果樹蟲害)

上本課程內容包括各種重要果樹作物害蟲之鑑定，害蟲危害過程及遺留痕跡的診斷，自田間採集蟲害標本，攜回實驗至，在解剖顯微鏡下觀察，依照圖鑑比對特徵來確認害蟲種類。

152029 Practice of Diagnosis 1 R F
and Management of Insect
Pests on fruits

Introduce the identification of insect species and the diagnosis of insect infestation on fruit trees. Students learned to collect samples from various parts of plants from the field, examine symptoms and excreta caused by insects. Pests are studied under dissecting microscope and compared with identification keys.

152030 植物蟲害診療實習 1 必 上
(蔬菜蟲害)

本課程內容包括各種主要蔬菜作物害蟲之鑑定，害蟲危害過程及遺留痕跡的診斷，自田間採集蟲害標本，攜回實驗至，在解剖顯微鏡下觀察，依照圖鑑比對特徵來確認害蟲種類。

152030 Practice of Diagnosis 1 R F
and management of insect
pests on vegetables

Introduce the identification of insect species and the diagnosis of insect infestation on vegetables. Students learned to collect samples from various parts of plants from the field, examine symptoms and excreta caused by insects. Pests are studied under dissecting microscope and compared with identification keys.

152031 植物病害診療實習 1 必 下
(糧食作物病害)

本實習課程內容主要有糧食作物病害診斷技術之介紹及訓練，包括病徵診斷，解剖診斷，病原分離培養接種及鑑定，生理生化診斷，生物診斷，免疫診斷與核酸診斷技術。及介紹糧食作物病害之計量及損失評估，防治原則，各種防治方法包括化學防治法、生物防治法、耕作防治法、物理防治法、法規防治法及經濟有效的綜合管理策略。

152031 Practice of Diagnosis 1 R S

Management of Plant

Disease on Food Crops

The objectives of this course are focused on (1)introduction and training of diagnostic techniques of food crops disease, which include symptomatic diagnosis, anatomic diagnosis, isolative and identification of pathogens, biochemical and physiological method, biological method, immunological diagnosis and nucleic acid techniques. (2)introduction of loss assessment, epidemiology, principles and practical control measures including chemical control, biological control, cultural control, physical control and quarantine control and the integrated disease management of food crops disease.

152032 植物病害診療實習 1 必 下

(觀賞植物病害)

本實習課程內容主要有觀賞植物病害診斷技術之介紹及訓練，包括病徵診斷，解剖診斷，病原分離培養接種及鑑定，生理生化診斷，生物診斷，免疫診斷與核酸診斷技術。及介紹觀賞植物病害之計量及損失評估，防治原則，各種防治方法包括化學防治法、生物防治法、耕作防治法、物理防治法、法規防治法及經濟有效的綜合管理策略。

152032 Practice of Diagnosis 1 R S

Management of Plant

Disease on Ornamental
Plants

The objectives of this course are focused on (1)introduction and training of diagnostic techniques of ornamental plant disease, which include symptomatic diagnosis, anatomic diagnosis, isolative and identification of pathogens, biochemical and physiological method, biological method, immunological diagnosis and nucleic acid techniques. (2)introduction of loss assessment, epidemiology, principles and practical control measures including chemical control, biological control, cultural control, physical control and quarantine control and the integrated disease management of ornamental plant disease.

152033 植物蟲害診療實習 1 必 下

(糧食作物蟲害)

本課程內容包括各種糧食作物、特用作物、花卉及樹木等作物害蟲之鑑定，害蟲危害過程及遺留痕跡的診斷，自田間採集蟲害標本，攜回實驗至，在解剖顯微鏡下觀察，依照圖鑑

比對特徵來確認害蟲種類。

152033 Practice of Diagnosis 1 R S
and management of insect
pests on Food Crops

Introduce the identification of insect species and the diagnosis of insect infestation on food crops. Students learned to collect samples from various parts of plants from the field, examine symptoms and excreta caused by insects. Pests are studied under dissecting microscope and compared with identification keys.

152034 植物蟲害診療實習 1 必 下
(觀賞植物蟲害)

本課程內容包括各種主要觀賞植物蟲害之鑑定，害蟲危害過程及遺留痕跡的診斷，自田間採集蟲害標本，攜回實驗室，在解剖顯微鏡下觀察，依照圖鑑比對特徵來確認害蟲種類。

152034 Practice of Diagnosis 1 R S
and management of insect
pests on Ornamental Plants

Introduce the identification of insect species and the diagnosis of insect infestation on ornamental plants. Students learned to collect samples from various parts of plants from the field, examine symptoms and excreta caused by insects. Pests are studied under dissecting microscope and compared with identification keys.

152035 植物醫學田野實習 8 必 上、下

本課程包括帶領學生至南部地區各農業場所如農業試驗所鳳山熱帶園藝試驗分所、高雄區農業改良場、農藥公司田間工作站及產銷班等，實際瞭解不同作物的栽培管理，此外依據不同季節田間病蟲害現況進行現場診斷示範並教導學生做案例討論。

152035 Field Study of Plant 8 R F, S
Medicine

The course provided practical training of integrated crop management. In order to understand the good agricultural practices of various crops, several field trips will be held to major agricultural stations in southern Taiwan. The methods of diagnosing plant disease and pests are demonstrated. Case studies by groups of students are also encouraged.

二、專業選修科目 Elective Courses

152036 微生物學 2 選 趙永椿、上

本課程之目的，在使學生瞭解微生物的起源，化學的基本原理，顯微鏡與染色，原核生物與真核生物細胞之形態、構造及功能，微生物的生長與代謝，遺傳與生物技術及微生物的防治，以增進學生未來在研究植物病原微生物之相關基礎。

152036 Microbiology 2 S Y. C. Chao, F

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

152037 微生物學實習 1 選 趙永椿、上

本實習之目的在訓練並建立學生在微生物學領域之基本基礎與技術，課程內容包括顯微鏡在微生物大小測量之運用，細菌的染色，培養基之製備，移種技術，微生物之分離、培養及接種技術，微生物之生理生化測試，微生物之定量及物理與化學因子抗微生物活性之評估。

152037 Practice of Microbiology 1 S Y. C. Chao, F

The purposes of this course are critically selected and tested to instruct students effectively in the basic principles and techniques within microbiological areas. Course contents include the microscopic measurement of microorganisms, bacterial staining, media preparation, culture transfer techniques, techniques for isolation, cultivation, and inoculation of microorganisms, physiological and biochemical tests of microorganisms, determination of cell number of microorganisms, and evaluation of the antimicrobial activity of physical and chemical agents.

152038 園藝學 2 選 何韻詩、陳麗筠、
劉福隆、下

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

152038 Horticulture 2 S Y. S. Ho, L. Y. Chen,
F. L. Liou, S

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

152039 園藝學實習

1

選

何韻詩、陳麗筠、

劉福隆、下

藉由田間作物的育苗、栽培和管理過程，初步了解所涉及的生產技術、科學、和可能遭遇的問題。認識常見的園藝作物。調查重要作物產銷情況及訪問業者。以此建立對本產業的整體認識。

152039 Practice of Horticulture 1

S

Y. S. Ho, L. Y. Chen,

F. L. Liou, S

The goal is to train students by practicing basic methods of plant production in the field, in order to experience technologies involved, and problems encountered; identifying common horticultural crops. Statistical searches are made on important horticultural crops. In the end of the course, students are presenting the results of visiting growers. So a overall understanding of this field is established.

152040 植物分類學

2

選

楊勝任、下

研究植物分類發展史、命名、重要種子植物分類群特徵數辨識、樹種的重要分布。

152040 Plant Taxonomy

2

S

S. Z. Yang, S

This course is designed to introduce the aim of taxonomy, principle and history summary. The content includes taxonomic literatures, nomenclature, concepts of taxa, the construction and use of keys, field collections method and herbarium of PPI introduction, phytography and the terminology of plant description, criteria used in classification of angiosperms and the phylogeny of angiosperms.

152041 植物分類學實習

1

選

楊勝任、下

植物分類學實習乃為使學生在 PPI 標本館與野外具有鑑定維管束植物的能力。其授課內容包括讓學生實際於野外採集並製成臘葉標本、教導學生如何使用科檢索表、以形態術語描述植物外部形態、參訪國內其它標本館並說明其功能與分類的價值、觀察臘葉標本與幻燈片加強野外鑑定能力。

152041 Practice of Plant

1

S

S. Z. Yang, S

Taxonomy

This practice of plant taxonomy is to provide the students with the ability to identify the vascular plants by the herbarium of PPI and in the fields. The content includes collecting plants in the fields and specimens made, using the key to the families to identify the unknown plants in the family level, describing the morphology of parts of plants by the terminology, examining the specimens of herbarium and slides to improve the ability of identification, visiting another herbarium of Taiwan to introduce the function and value to the study of taxonomy.

152042 植物組織培養學

2

選

鄭秋雄、上

本課程主要介紹組織培養之基本知識、技術及其在植物抗病、抗蟲、抗藥及抗逆境等品種之選育與保存上之應用。主要內容包括組織培養學簡史、培養基組成分、培養環境、細胞培養、植物再生、莖頂培養、花藥培養、雜種胚胚培養、原生質體培養、細胞融合、抗病細胞篩選技術及微體繁殖等。

152042 Plant Tissue Culture

2

S

C. C. Cheng, F

Techniques

The course is to introduce the basic knowledge and techniques of tissue culture, and how to apply in the selection and preservation of disease-resistant, insect-resistant, drug-resistant, and environmental stress-resistant plant. The main content includes the brief history of tissue culture, medium composition, cultural condition, cell culture, plant regeneration, meristem culture, anther culture, hybrid embryo culture, protoplast culture, cell fusion, disease-resistant cell selection and mass propagation.

152043 植物組織培養學實習

1

選

鄭秋雄、上

主要訓練學生在組織培養方面之基本技術，內容包括：培養基之製備、無病植株大量繁殖、細胞培養及器官分化培養、細胞融合與抗病、抗蟲、抗藥、抗逆境品種之選育。

152043 Practice of Plant Tissue

1

S

C. C. Cheng, F

Culture Techniques

The course concentrates on the training of the basic techniques of tissue culture. It includes the media preparation, the mass propagation of disease-free plant, the cell culture and organ differentiation culture, the cell fusion, the selection of disease-resistant, insect-resistant, drug-resistant and environmental stress-resistant plant.

152044 有害動物

2

選

鄭光哲、上

有害動物的範圍包含除昆蟲，線蟲及原生動物外，可能會危害植物的動物，如嚙齒類、鳥類、蝸牛等。討論的範圍有動物所造成的損害嚴重性、危害特性、生態條件、防治策略的制定原則、施行注意事項、效果評估等。目的在使對植物的整體保護概念能更完整。

152044 Noxious Animals

2

S

K. C. Cheng, F

Animals besides insects、nematodes、protozoas are termed as noxious animals, i. e. rodents、birds、snails etc. Categories discussed are characteristics of damages to plants, ecological situations, principle、practicing and assessment of control strategies.

152045 資源昆蟲

2

選

華 真、下

本課程包含範圍相當廣泛，對人類有用或有益的昆蟲皆可列為此課程之範圍，然就本省之環境及條件所需，本課程以有用之昆蟲為主，其中包括蠶之養殖、利用，蜂之飼養、蜂產品之介紹及採收，此兩大項為主。其次在介紹與人類相關之藥用昆蟲及相關之藥理；食用昆蟲之種類及其應用；觀賞昆蟲之種類及利用；以及資源保育昆蟲之介紹。至於天敵應用之昆蟲則不在本課程之內。

152045 Insects Resources

2

S

T. Hua, S

This course includes useful and beneficial insects, especially in the sericulture, bees keeping, bees products, rearing silkworms, medical insects and edible insects. Also the wildlife resource insects is arranged in this course, exclude the natural enemies and its application.

152046 農業氣象學

2

選

唐 琦、下

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

152046 Agricultural Meteorology 2 S

C. Tang, S

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

observation is helpful for the learners to apply the knowledge of meteorology in agricultural cultivation and then will be concerned the environment.

152047 昆蟲形態學

2

選

張萃嫻、上

本課程主要介紹昆蟲發生之源始及其外表形態各部構造之特徵、功能並推論其演化；課程內容包括昆蟲發生、體壁形成、頭部及其副器之構造與功能、胸部及足與翅之構造與功能、腹部及其副器之構造與功能等。

152047 Insect Morphology

2

S

T. Y. Chang, F

The objective of this course is to introduce the origin, character, function and evolution of external morphology structure of insect. Topics includes insect development, the integument and its function, the head structure and its appendages, the thorax structure and its appendages, includes legs and wings, the abdomen and its appendages and inferring the function and evolution of external morphology structure of insect.

152048 食用菌栽培技術

2

選

鄭光哲、上

食用菌如洋菇、草菇、鮑魚菇、木耳、金針菇及香菇等菇類之生理、生態及形態之認識，栽培方法為基本內容。介紹各種菇類栽培之理論與實際配合，探究菇類生長之條件，對目前國內外流行而適合企業化經營之食用菌類特別作有系統之說明，以利選讀生將來應用。

152048 Edible Fungi Cultivation

2

S

K. C. Cheng, F

Edible fungi such as common mushroom, chinese mushroom, oyster mushroom, Jelly fungi mushroom and shiitake are the major subjects to be discussed in lectures. The physiology, ecology and morphology provide basic information to culture the mushroom. Knowing how to compost manure, isolates the mycelia theory and practical operation, especially emphasized on large-scale commercial cultivation of mushrooms in status and future of the world, and to meet the need of techniques and knowledge for mushroom production.

152049 昆蟲生理學

2

選

辛竹英、下

本課程主要介紹昆蟲營養、呼吸、消化、排泄、循環、神經、生殖及腺體等系統之生理作用及機制。強調昆蟲為適應各種環境而在生理構造及功能上的變化，並比較昆蟲與哺乳動物生理間的差異。

152049 Insect Physiology

2

S

C. Y. Hsin, S

Introduce life process of the insects, including major life system, nervous system, reproductive development and behavior. Emphasize the physiological variation

of the structure and function in insects to adapt the living environment. The differences of physiology between insect and mammals are discussed.

152050 生物技術與植物醫學 2 選 鄭秋雄 下

本課程主要介紹生物技術之基本概念及其在植物保護上之應用。課程內容包括基因構造及功能、基因表現及基因重組技術、細胞融合技術、組織細胞培養技術等基本概念及生物技術應用於植物病蟲害之診斷與抗病、抗蟲、抗藥、抗環境逆境品種之選育。

152050 Biotechnology and Plant 2 S C. C. Cheng ,S
Medicine

The course is to introduce the concept of biotechnology and applying in the plant protection. The contents of this course include the structure and function of gene, the technologies of gene expression and recombinant DNA, cell fusion, tissue and cell culture, biotechnology applies in the diagnosis of plant diseases and insect pest and the selection and breeding of disease-resistant, insect-resistant, drug-resistant, environmental stress-resistant plants.

152051 植保法規及檢疫 2 選 趙永椿、下

本課程之目的，在使學生瞭解及熟知與植物保護及檢疫相關的各種法規。

152051 Plan Protection 2 S Y. C. Chao, S
Regulations and
Quarantine

The purpose of this course is to study the laws and regulations of plant protection and to give students the basic knowledge of pest quarantine and how to prevent import and spread of plant pest entry into or passage through our country from other countries. Course contents include the agreement on the application of sanitary and phytosanitary measures、the law and bylaw of commodity inspection and quarantine、the law and bylaw of pesticide、the law and bylaw of plant quarantine etc.

152052 熱帶植物病蟲害 2 選 辛竹英、上

本課程主要介紹熱帶農園藝作物、果樹及花卉之病蟲害，包括為害特徵、病因、病原菌特性、病蟲害發生生態、診斷技術及防治管理方法等。

152052 Pests and Diseases of 2 S C. Y. Hsin, F
Tropical Plants

This course offer a complete profile of the pest and disease occurred in tropical palm trees, fruit trees and flower plants. The major contents included symptoms, etiology of pathogen, ecology, diagnostic techniques and control.

152053 生物防治

2 選

鄭光哲、上

本課程主要廣泛討論目前世界上可能應用之天敵及微生物可以用來作為綜合防治中之生物防治技術，以代替傳統化學農藥之防治。天敵及微生物個別詳以介紹其應用潛力，並以目前成功之病害、蟲害、草害之生物防治例子說明其成功因素及應用方法，作為發展生物防治之理論基礎。

152053 Biological Control

2 S

K. C. Cheng, F

The course of biocontrol of plant diseases and pests are attempted to scrutinize very carefully the current status of biological control in agricultural integrated pest management system in a broad sense. The application and implementation of natural enemies and microorganisms for disease and pest control to instead of traditional chemical controls are the objectives. The possible candidates vitae of control agents including natural enemies and microbes would be brought for detail discussion. The components and approaches of successful implementative exemples of biocontrol in the course could serve as revealing perspectives for future of biocontrol practices.

152054 設施園藝病蟲害

2 選

辛竹英、上

本課程主要介紹在各種設施中栽培之作物如蔬菜、木瓜、花卉、觀賞植物等之病蟲害種類、發生生態、防治及管理。

152054 Pests in Horticultural

2 s

C. Y. Hsin, F

Structures

This course introduce the pests and diseases found in crops, fruit trees, flowers and ornamental plants under construction. The contents included kinds of pests and disease found in the construction, their occurrence, control and management.

152055 昆蟲病理學

2 選

本課程旨在使學生瞭解昆蟲與微生物之間的關係，蟲病發生原理等，俾供發展害蟲微生物防治法，預防或治療有用昆蟲之病害。

152055 Insect Pathology

2 S

The purpose of this course is to illustrate the relationship of insects and microorganism, principle of insect pathogenesis. Making students understand those

diseases which can be utilized as micro-biocontrol, prevention and treatment infested insects.

152056 農企業管理 2 選 下

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

502056 Agribusiness Management 2 S S

The course gives a systematic knowledge for agribusiness manager includes as follows: The contents of Agribusiness; Planning and Decision; Information collection and Analysis; Forecasting; Products and Production planning; Capital and Budget; Cost and Revenue; Cost evaluation and Benefit analysis; Agribusiness marketing; Agricultural policy and environment protection; Agribusiness Organization; Manpower Resources; Controlling; Management Indicators.

152057 植物流行病學 2 選 梁文進、下

本課程討論植物疾病之主要因子，寄主病原體，環境因子，人類耕作管理與流行病發生之關聯性；流行病之發生類型與比較，發展過程，模式及電腦模擬；植物流行病之預測及預警與植物病理上專家系統之結合。

152057 Plant Disease Epidemiology 2 S W. J. Liang, S

The contents of this course are listed as follows : The plant disease elements (host , pathogen and environment factors) affecting development of plant disease epidemics , the patterns and comparison of epidemics ; the development , modeling and computer simulation of plant disease epidemics ; and the forecasting and disease-warning systems of plant disease epidemics combining with expert systems of plant pathology.

152058 樹木病蟲害 2 選 陳滄海、下

本課主要介紹林木病蟲害之特性、發生調查、診斷及管理，森林病蟲標本採集保存。並介紹苗木、枝幹、葉部、根部病蟲害及立木與木材腐朽等各論。

152058 Forest Pests 2 S T. H. Chen, S

This course is to introduce the characteristics of damage induced by forest diseases and insect pests. It covers pest investigation, diagnosis and management, and specimen collection and preservation. A comprehensive discussion on pests of

seedling, twig, foliage, root and wood decay is also included.

152059 蟲害發生預測預報

2

選

張念台、下

本課程首先教授包括昆蟲生長發育、休眠滯育、遷移擴散等影響發生之生物學特性，其次探討生物與非生物因子對昆蟲發育與發生的影響，再闡述昆蟲族群數量消長之變動規率，其中包括族群生長速率、生命表製作與分析、害蟲發生預測之數學模式應用、族群消長因素分析，以及族群調查技術與資料處理，最後討論害蟲預測預報之方法與實例。

152059 Monitoring and Forecasting

2

S

N. T. Chang, S

of Insect Pests

The biological characteristics of insect growth, development, diapause and migration are introduced at the begining of this course. Then, the dynamic interactions found among insects and their relationships to both the biotic and abiotic components of the environment are studied. The techniques of population sampling, age-stage-specific life table formating, population dynamics analysizing and modeling are taught to deal with various predictive methods of the insect population dynamics.

152060 居家害蟲

2

選

張念台、下

本課程主要介紹與傳播人體疾病相關之重要病媒昆蟲。尤其強調蚊蠅等重要病媒之生物學、其與傳播病原間的關係以及防治策略。

152060 Domestic Pests

2

S

N. T. Chang, S

This lecture will introduce the major medically important insect vectors. The course highlights the biology of significant insect species, the diseases they transmit as well as the control strategies.

植物醫學系 Department of Plant Medicine

課程代號 Course Number	科目名稱(中文) Course (Chinese)	學分 Credits	科目名稱(英文) Course (English)	頁次 Page
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專業必修科目 Required Courses

156001	實驗設計與數據分析	2	Experimental Design and Data Analysis	
156002	文獻選讀	2	Literature Review	
156003	專題討論	4	Seminar	
156004	碩士論文	6	Thesis	

專業選修科目 Elective Courses

156005	高等植物病理學	3	Advanced Plant Pathology	
156006	植物病原學特論	2	Special Topics on Plant Pathogens	
156007	植物檢疫防疫法規	2	Plant Quarantine and Inspection Laws	
156008	作物抗病育種	2	Plant Breeding Against Diseases	
156009	電顯技術	2	Electron Microscopy	
156010	高等昆蟲學	3	Advanced Entomology	
156011	作物抗蟲育種	2	Plant Breeding Against Insect Pests	
156012	蟎蟬學特論	2	Special Topics on Acarology	
156013	高等昆蟲生理學	2	Advanced Insect Physiology	
156014	植物病原傳播學	2	Dissemination of Plant Diseases	
156015	植物流行病學	2	Plant Diseases Epidemiology	
156016	血清學技術	2	Serology	
156017	生物防治特論	2	Special Topics on Biological Control	
156018	熱帶作物病害特論	2	Special Topics on Tropical Crop Diseases	
156019	昆蟲分類與演化	2	Insect Taxonomy and Evolution	
156020	蟲害發生與預測	2	Outbreak and Forecast of Insect Pests	
156021	熱帶作物蟲害特論	2	Special Topics on Tropical Crop Insect Pests	
156022	植物病害診斷與檢疫技術	2	Diagnosis and Quarantine of Plant Diseases	
156023	昆蟲生態學特論	2	Special Topics on Insect Ecology	
156024	昆蟲行為學特論	2	Special Topics on Insect Behavior	
156025	農藥毒理學	2	Pesticides Toxicology	
156026	植物害蟲診斷與檢疫技術	2	Identification and Quarantine of Insect Pests	
156027	雜草特論	2	Special Topics on Weeds	
156028	有害生物綜合管理特論	2	Special Topics on Integrated Pest Management	
156029	數值分類學	2	Numerical Taxonomy	
156030	分子植物醫學	2	Molecular Plant Medicine	
156031	農業發展與國際合作	4	Agricultural Development and International Cooperation	

植物醫學系

Department of Plant Medicine

一、必修科目 Required Courses

156001 實驗設計與數據分析 2 必 張念台

介紹生物學上數據的收集與統計處理、藉基本實驗設計原理及方法的說明，強調適當實驗設計導致較佳統計分析的結果。

156001 Experimental Design and Data Analysis 2 R N. T. Chang

An introduction to the collecting a statistical handling of biological data. The principles and methods of experimental designs, which lead to better statistical analysis, are discussed.

156002 文獻選讀 2 必 張念台

本課程選擇並指定植物保護相關重要文獻供研讀、討論與撰寫心得，藉以訓練學生讀寫、表達溝通及評論思考之能力。

156002 Literature Review 2 R N. T. Chang

In order to improve the skills of reading and writing, oral communication and critical thinking of graduate students, publications on the research topics in plant protection and allied fields will selected and students will assigned to study, discuss and review those papers.

156003 專題討論 4 必

本課程旨在訓練研究生對資料蒐集、整理及表達的能力。學生選擇與植物保護學門或碩士論文有關的主題，蒐集文獻、閱讀、整理成摘要，然後提出報告討論，並由參與教師評分。

156003 Seminar 4 R

This course is designed to train graduate students the ability in searching literature, organization of material and presentation. Students are required to select a topic in the field of plant protection or those related to their thesis, search and review literature and draw up a brief. This presentation is scheduled for every student once a semester. Their performance is evaluated by the faculty member.

176004 碩士論文 6 必 各教師

利用完整執行之試驗、觀察或實務操作，使學生能徹底了解並應用修課之知識。

練習口頭報告、與科學論文之寫作。老師則藉由討論，提供改進之意見。

176004 Thesis

6 R

All faculties

After a well-designed project being properly conducted by students, he/she will be asked to give a oral presentation and submit the thesis before a deadline. Knowledge acquired during the study should be made use of sufficiently in the preparation of the thesis. Frequent and intensive discussions among teachers and students will be arranged to improve the quality of his/her research.

二、選修科目 Elective Courses

156005高等植物病理學

3 選

高等植物病理學是由分子、細胞、組織及器官不同層次探討植物病變過程之形態與生理變化及病原與寄主之間相互作用，進而討論植物抗病機制及病害管理之策略，尤其注重分子生物技術應用於植物病理之發展。

156005 Advanced Plant Pathology

3 S

Advanced plant pathology is intended to review and discuss the morphological and physiological changes of diseased plants from molecular, cellular, and histological to organ levels. The pathogenesis of the host disease resistance and the interaction between host and pathogen related biotechnology applied in disease diagnosis and control also the important section in this course.

156006植物病原學特論

2 選

梁文進

本課程主要在深入了解植物病原真菌、細菌、病毒和線蟲等之形態、分類、生理、生態及其致病為害之特性。

**156006 Special Topics on Plant
Pathogens**

2 S

W. J. Liang

This course is to discuss the biotic factors that caused plant diseases and characteristics of morphology, physiology, ecology, and classification and pathogenically of pathogens.

156007植物檢疫防疫法規

2 選

本課程之目的，在使學生瞭解及熟知與植物保護及檢疫相關的各種法規。

**156007 Plant Quarantine and Inspection
Laws**

2 S

The purpose of this course is to study the laws and regulations of plant protection and to give students the basic knowledge of pest quarantine and how to prevent import and spread of plant pest entry into or passage through our country from other countries. Course contents include the agreement on the application of sanitary and phytosanitary measures、the law and bylaw of commodity inspection and quarantine、the law and bylaw of pesticide、the law and bylaw of plant

156008作物抗病育種

2 選

本課程的目的在使學生瞭解抗病育種在作物病害防治上所扮演的角色。本課程討論抗病之本質化以及如何利用抗病育種原理來達到作物病害防治的目的。內容包括：
1.作物抗病之類型。2.寄主與病原菌之共同演化。3.抗病育種在病害防治上的限制。4.抗病育種技術等主題。

156008 Plant Breeding Against Diseases

2 S

The purpose of this course is to inquire into the role of resistance in plant disease. It discusses the nature of resistance and how it can best be use to protect crops from disease. The contents of this course are : 1.Types of disease resistance in plants. 2.Coevolution of plants and pathogens. 3.The limits of disease control by plant breeding. 4.Breeding methods for disease resistance.

156009電顯技術

2 選

陳滄海

本課程主要介紹電子顯微鏡的基本原理與應用 內容包括兩部分：(一)穿透式電子顯微鏡之構造，材料之固定與包埋、超薄切片、負染色與金屬投影(二)掃描式電子顯微鏡之構造，樣品製作、臨界點乾燥等。

156009 Electron Microscopy

2 S

T. H. Chen

The course offers a complete understanding of the principle and application of electron microscope. The contents include two sections: 1.construction of transmission electron microscope (TEM), chemical fixation、embedding、staining and metal shadowing. 2.construction of scanning electron microscope (SEM), preparation of specimen for SEM.

156010高等昆蟲學

3 選

辛竹英

介紹昆蟲的構造及其功能，強調昆蟲的構造在環境中的適應與在演化上的重要性。

156010 Advanced Entomology

3 S

C. Y. Hsin

Introduce the functional anatomy and ultrastructure of insects, with emphasis on adaptation and evolutionary significance.

156011作物抗蟲育種

2 選

作物抗蟲育種的目的是增加植物對昆蟲之抗性，植物本身對昆蟲的侵害所具有的容忍忌避及復原的特性；在類似環境下，同種中之其他個體對這些害虫之危害所造成的損失，要遠比前者為大。改良成為理想的品種，往往需要以人為的方法除去或增加某些因子，以增加抗性。

Pests

156012 蝽蟬學特論

2 選

華真

156012 Special Topics on Acarology

2 S

T. Hua

156013高等昆蟲生理學

2 選

辛竹英

156013 Advanced Insect Physiology

2 S

C. Y. Hsin

156014植物病原傳播學

2 選

陳滄海

156014 Dissemination of Plant Diseases

2 S

T. H. Chen

156015植物流行病學

2 選

梁文進

156015 Plant Disease Epidemiology

2 S

W. J. Liang

29

affecting the development of plant disease epidemics, the patterns and comparison of epidemics; the development, modeling and computer simulation of plant disease epidemics; and the forecasting and disease-warning systems of plant disease epidemics which are integrated with expert systems of plant pathology.

156016血清學技術

2 選

陳滄海

本課程主要介紹免疫學原理，抗原、抗體之特性與純化製備，以及各種血清學反應與應用。

156016 Serology

2 S

T. H. Chen

The course offers a comprehensive introduction to the principle of immunology. The contents cover the preparation of immunogens, production and characterization of antibody and serological techniques applied in plant protection.

156017生物防治特論

2 選

本課程由細胞及分子層次，探討各種生物防治因子如病毒、真菌、細菌及線蟲作為植物病害防治之作用機構，生物防治因子與植物病原相互作用關係。進而說明應用各種可能之生物技術將該因子作量產培養，生物製劑之方法及遺傳工程之基因轉殖發展更具防治潛力之生物因子或基因轉殖之抗病品種之植物。

156017 Special Topics on Biological Control

2 S

The attempt of this lecture is try to understand the biocontrol mechanism of biological agents, such as bacteria, fungi, viruses and nematodes against plant disease to reduce disease damages or infection potential of pathogens from cellular or molecular level. Knowing the interaction between biocontrol agent and pathogen on the host plant or in environment is another objective of this lecture. The application of biocontrol agents and genetic engineering of a transgenic agent to improve or enhance its biocontrol effectiveness or to develop the transgenic resistant variety would be brought for detail discussion.

156018熱帶作物病害特論

2 選

鄭秋雄

本課程首先介紹熱帶農業體系之特性，進而論及熱帶作物田間與採收儲運期之病害種類、發生生態，最後再探討經濟有效之防治方法。範圍涵蓋穀類作物、豆科作物、根莖作物、蔬菜、花卉、飼料作物、藥草及棉、麻、油脂類特用作物等。

156018 Special Topics on Tropical Crop Disease

2 S

C. C. Cheng

The course offers a complete understanding of the characteristics of tropical crop diseases and of how to manage the diseases. The diseases of the tropical crops, e.g., cereals, food legumes, root and tuber crops, vegetables, flowers, forages, drug crops, fiber crops, and oil crops will be discussed

in detail.

156019 昆蟲分類與演化

2 選

張萃女英

昆蟲的演化，使單純的系譜加以分化，隨著分化，不同類別的雜交演化及遺傳基因新的組合，而產生不同的後代，以此作為有系統的分類。

156019 Insect Taxonomy and Evolution 2 S

T. Y. Chang

The evolution of a number of rather different insects from a single ancestral group. Insect species exist in interbreeding groups, population, whose members exhibit variation. Classified the insects to ancestral and identification.

156020 蟲害發生與預測

2 選

張念台

以昆蟲生態學為基礎，介紹害蟲取樣、調查方法，進而對其族群之發生期與發生量加以數理預測與評估。

156020 Outbreak and Forecast of Insect 2 S

N. T. Chang

Pests

Basing on the insect ecology, the practice of sampling, quantitative forecast and evaluation of occurring period and amount relative to pest population are discuss

156021 熱帶作物蟲害特論

2 選

提供區別及認識其重要的個別的特性、害虫特性，台灣及熱帶地區危害狀況及分佈，主要防治方法及生物防治法。

156021 Special Topics on Tropical Crop 2 S

Insect Pests

Provides for identifying and learning essential elements of the biology and distribution of the most important pests of the tropics. Principles and methods of pest control. Biological control of insect pests in Taiwan and the world.

156022 植物病害診斷與檢疫技術

2 選

鄭秋雄

本課程主要介紹植物病害之各種診斷技術與檢疫技術。課程內容包括病徵學、病原形態學、血清學、生物檢定及分子生物學等病害診斷技術與植物檢疫技術之介紹。

156022 Diagnosis and Quarantine of 2 S

C. C. Cheng

Plant Diseases

The course is to introduce various technologies of diagnosis and quarantine of plant diseases. The contents of this course include that introduce the technologies of symptomatological, pathogenic morphological, serological, bioassay and molecular biological diagnosis of plant diseases and plant

quarantine.

156023 昆蟲生態學特論

2 選

張念台

討論有關昆蟲族群之分布、豐度、消長、調節、以及種間交互作用等主題，並分析其與環境和生態系間的關係。

156023 Special Topics on Insect Ecology 2 S

N. T. Chang

The population distribution, abundance, dynamics, regulation, as well as inter- and inter-specific interactions of insects are discussed and analyzed in relation to environment and ecosystems.

156024 昆蟲行為學特論

2 選

辛竹英

介紹不同種類昆蟲其取食、防衛、遷移、求偶、社會昆蟲群聚、溝通等現象及意義。

156024 Special Topics on Insect Behavior

2 S

C. Y. Hsin

Introduce some general activities common to insects in different groups. The behavior included feeding、defensive strategies、insect migrations、acoustic behavior、pheromone、gregarious and social behavior.

156025 農藥毒理學

2 選

辛竹英

介紹農藥的化學性質、作用機制、生物活性及農藥在病蟲害防治工作的應用，將強調新類型的生物藥劑及藥劑的選擇性，並討論農藥對人類健康與對環境的影響。

156025 Pesticides Toxicology

2 S

C. Y. Hsin

Introduce pesticide chemistry、biochemical modes of action、biological activity and theory of pesticide application of management programs. Emphasis is placed on novel biological insecticides and insecticides with selective properties. The effect of pesticides on human health and environment will be discussed.

156026 植物害蟲診斷與檢疫技術

2 選

本課程主要介紹植物蟲害之各種診斷技術與檢疫技術。

156026 Identificatuon and Quarantine of Insect Pests 2 S

The course is to introduce various technologies of diagnosis and quarantine of **Insect Pests**

156027 雜草特論

2 選

鄭秋雄

課程包括雜草與作物間的相互關係，種子和植物體的繁殖法，及雜草與作物的競爭，他毒作用及生他因子在草害管理上的角色。

156027 Special Topics on Weeds 2 S C. C. Cheng

The course include : Ecological concepts for weed-crop relationships, reproduction from seed and vegetative plants, competitiveness of weeds, allelopathy in weed management, biotic agents in weed management.

156028有害生物綜合管理特論 2 選 張念台

討論農業生態系中重要作物之病原、害蟲與其他有害生物綜合管理的策略與方法。

156028 Special Topics on Integrated 2 S N. T. Chang
Pest Management

The strategies and tactics of integrated management of pests in agricultural ecology of important crops are discussed.

156029數值分類學 2 選 張萃嫻

本課程主要介紹數值分類學的發展歷史、基本原理和分類運算分析方法，內容包括表徵分類和支序分類兩種不同的分類觀點以及相應的各種數學方法和電腦技術。

156029 Numerical Taxonomy 2 S T. Y. Chang

This course mainly introduces the development, principles and analysis methods of numerical taxonomy. The contents include phenetics, cladistics and their comparisons. The application of mathematical methods and computer technique about numerical taxonomy are also included.

156030分子植物醫學 2 選 鄭秋雄

本課程主要介紹分子生物學在植物病害診斷、蟲害鑑定、病蟲害綜合管理及抗病、抗蟲、抗藥、抗環境逆境植物育種上之應用。

156030 Molecular Plant Medicine 2 S C. C. Cheng

This course is to introduce the molecular biology applied in diagnosis of plant diseases, identification of insect pests, the integrated management measures of plant diseases and insect pests, the breeding of disease-resistant, insect-resistant, drug-resistant, and environmental stress-resistant plants.

156031農業發展與國際合作 2 選

本課程內容在介紹中華民國在臺灣五十年來之農業發展過程，從初期的土地改革

政策及以農業為主之經濟發展，進入以工商業為主之現代化社會，同時在配合農業升級及回饋國際社會政策下推展各項國際合作計劃；目的在使同學能鑑往知來，為下一世紀之農業開創新局。

156031 Agricultural Development 2 S
and International Cooperation

This course is to provide an insight of agricultural development of Taiwan for the past 50 years, and also point out its new direction for the next century. Its contents include: land reform programs, agricultural trade and economic development, transformation from an agricultural to industrialized economy, and international cooperation.