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開課班級：四熱農二A

授課老師：陳光堯

學分數：3

課程大綱：

本課程在使學生獲得有關植物生理學之基本知識，課程內容包括理解植物生理所需之基本理化概念、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。

outline:

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 .

教學型態：

課堂教學

成績考核方式：

平時成績:30%

期中考:30%

期末考:30%

其它:Attendance: 10%%

本科目教學目標：

- 1.培育熱帶農業基礎人才。
- 2.發展農、林、漁、牧相關技術。
- 3.建立永續農業經營與國際合作觀。

參考書目：

Fundamentals of Plant Physiology

<https://global.oup.com/ushe/product/fundamentals-of-plant-physiology-9781605357904?q=Fundamentals%20of%20Plant%20Physiology&cc=us&lang=en> Second Edition:

<https://global.oup.com/academic/product/fundamentals-of-plant-physiology-9780197614167?cc=us&lang=en> 書名：Plant Physiology and Development, 版本：6th Edition, 作者：Taiz, Zeiger, Møller, and Murphy, 出版商：Oxford University Press, 網址連結：

<https://global.oup.com/ushe/product/plant-physiology-and-development-9781605352558?q=plant%20physiology&lang=en&cc=us>

https://www.amazon.com/s?k=Fundamentals+of+Plant+Physiology&i=stripbooks-intl-ship&crd=2YHHLJ8EH6639&srefix=fundamentals+of+plant+physiology%2Cstripbooks-intl-ship%2C235&ref=nb_sb_noss_1 eText ISBN: 9781605357911, 160535791X

<https://www.vitalsource.com/products/fundamentals-of-plant-physiology-lincoln-taiz-eduardo-zeiger-v9781605357911>



課程進度表：

週次	起訖月日	授課單元(內容)	備註
第1週	9.08~9.15	General Introduction Plant and Cell Architecture 1. Plant Life: Unifying Principles2. Overview of Plant Structure3. Plant Cell Organelles	8日正式上課。8~12日課程加退選，轉學(系)生、復學生及延修生選課，雙主修、輔系申請，12日申辦抵免學分截止日
第2週	9.15~9.22	;Water and Plant Cells 1. Water in Plant Life2. The Structure and Properties of Water3. Diffusion and Osmosis	
第3週	9.22~9.29	Water Balance of Plants 1. Water in the Soil2. Water Absorption by Roots3. Water Transport through the Xylem	28日(日)孔子誕辰紀念日/教師節(放假),29日(一)補假
第4週	9.29~10.06	Mineral Nutrition 1. Essential Nutrients, Deficiencies, and Plant Disorders2. Treating Nutritional Deficiencies3. Soil, Roots, and Microbe ; Solute Transport 1. Passive and Active Transport2. Transport of Ions across Membrane Barriers3. Membrane Transport Processes	29日成績優異提前畢業者提出申請截止日
第5週	10.06~10.13	;QUIZ #1 Solute Transport 1. Passive and Active Transport 2. Transport of Ions across Membrane Barriers3. Membrane Transport Processes ; Assimilation of Inorganic Nutrients 1. Nitrogen in the Environment2. Nitrate Assimilation3. Ammonium Assimilation	6日(一)中秋節(放假)，10日(五)國慶日(放假)
第6週	10.13~10.20	Photosynthesis: The Light Reactions 1. Photosynthesis in Higher Plants2. General Concepts3 Key Experiments in Understanding Photosynthesis	14日學生宿舍安全輔導暨複合式防災疏散演練。18日多益測驗
第7週	10.20~10.27	Photosynthesis: The Light Reactions 1. Photosynthesis in Higher Plants2. General Concepts3 Key Experiments in Understanding Photosynthesis ; Photosynthesis: The Carbon Reactions 1. The Calvin-BCyenson;cle (Reductive Pentoase Phosphate Cycle)2.;Photorespiration: The C2 Oxidative Photosynthetic Carbon Cycle (C2 photosynthesis)3. Inorganic Carbon-Concentrating Mechanisms	24日(五)補假，25日(六)光復暨古寧頭大捷日(放假)。
第8週	10.27~11.03	Photosynthesis: Physiological and Ecological Considerations 1. Photosynthesis Is the Primary Function of Leaves2. Photosynthetic	30日校課程委員會



		Response to Light by the Intact Leaf3. Photosynthetic Responses to Temperature	
第9週	11.03~11.10	MIDTERM EXAM 13:30 TA205, November 06, 2025	3~9日期中考試
第10週	11.10~11.17	Translocation in the Phloem 1. The Pathway of Translocation2. Patterns of Translocation: Source to Sink3. Materials Translocated in the Phloem	13日教務會議,16日教師期中成績上網登錄截止日
第11週	11.17~11.24	Respiration and Lipid Metabolism 1. Overview of Plant Respiration2. Glycolysis3. The Oxidative Pentose Phosphate Pathway	
第12週	11.24~12.01	Signals and Signal Transduction 1.;Signal perception and Amplification2. Hormones and Plant Development3. Phytohormone Metabolism and Homeostasis	24~28體育運動週。24日校園路跑。27日運動大會夜間開幕，28日運動大會活動，29日101週年校慶活動日，照常上班
第13週	12.01~12.08	Signals from Sunlight 1.;Plant Photoreceptors2.;Phytochromes3.;Phytochrome Responses	
第14週	12.08~12.15	QUIZ #2 ; Embryogenesis 1. Overview of Plant Growth and Development2. Embryogenesis: The Origins of Polarity3. Meristematic Tissues: Foundations for Indeterminate	12日申請停修課程截止日
第15週	12.15~12.22	Seed Dormancy, Germination, and Seedling Establishment 1.;Seed Structure2.;Seed Dormancy3.;Release from Dormancy	
第16週	12.22~12.29	25th Constitution Day (Holiday) Vegetative Growth and Senescence 1.;The Shoot Apical Meristem2.;Leaf Structure and Phyllotaxy3.;Differentiation of Epidermal Cell Types	22日校務會議。25日行憲紀念日(放假)
第17週	12.29~1.05	1st New Year ' s Day (Holiday) Flowering and Fruit Development 1. Floral Evocation: Integrating Environmental Cues2. The Shoot Apex and Phase Changes3. Photoperiodism: Monitoring Day Length	1日(四)開國紀念日(放假)
第18週	1.05~1.12	FINAL EXAM 13:30 TA205, January 09, 2025	5~11日期末考試，10~11日學生退宿