

國立清華大學 112 學年第 1 學期新開課程課程大綱

科號	11210LS 312100	組別		學分	3	人數限制				
修課年級	大二以上									
上課時間	M3M4W2			教室	生二 105					
科目中文名稱	植物生理學									
科目英文名稱	Plant Physiology									
任課教師	劉姿吟 副教授 (Unit I -III) 賀端華 特聘講座教授/中央研究院院士 (Unit IV)									
擋修科目	限修畢生命科學一和二基礎課程	擋修								

一、課程說明	<ol style="list-style-type: none"> 1. To help students understand anatomical structures, cellular activities, and life processes of plants based on the complete life cycle of seed plants from germination to senescence. 2. This course emphasizes how-we-know-what-we-know of plant physiology and is aimed to develop the ability to appreciate and explore the wonders of the plant life. 3. To provide a broad framework for the students who are interested in pursuing advanced study in plant physiology.
二、指定用書	Hopkins W. G. and Hüner N. P. A. (2009) Introduction to Plant Physiology. 4th ed. John Wiley and Sons, Inc.
三、參考書籍	<ol style="list-style-type: none"> 1. Taiz L., Zeiger E., Møller I. M., Angus M., (2022) Plant Physiology and Development. 7th ed. Sinauer Associates, Inc. 2. Jane B Reece, Lisa A Urry, Michael L Cain, Steven A Wasserman, Peter V Minorsky, Robert B Jackson. (2020) Campbell Biology. 12 ed. Benjamin Cummings, Inc.
四、教學方式	<ol style="list-style-type: none"> 1. 主要由任課老師講解學習內容 2. 各個教學單元結束後，課後以分組方式進行討論及課堂上口頭報告(quiz-based discussion)，為培養學生主動學習及獨立思考的能力，依照組員個別參與小組討論程度及報告內容作爲學習成果評量(共三次，評量分數加總占總成績 30%) 3. 16週授課，將原先18週授課內容導入的動畫教材，直接放置eclass提供學生預習或複習

五、教學進度	<p>Unit I: Plant Cell, Movement of Water and Nutrients</p> <ul style="list-style-type: none"> • Plant Growth and Plant Cell Wall • Plant water relations at the cell and the whole-plant level • Roots, Soils, and Nutrient Uptake • Vascular Tissues and Solutes Transport • Mineral Nutrients <p><i>Quiz-based Discussion</i></p> <p>Unit II: Photosynthesis</p> <ul style="list-style-type: none"> • Photosynthesis: Harvesting Sunlight • Photosynthesis: CO₂ Assimilation • Allocation, Translocation and Partitioning of Photoassimilates • Cellular Respiration: Unlocking the Energy Stored in Photoassimilates • Production and Storage of Secondary Metabolites <p><i>Quiz-based Discussion</i></p>
	Midterm exam
	Unit III: Plant Development
	Seed Dormancy, Germination, and Seedling Establishment
	<ul style="list-style-type: none"> • Responding to Light: Photoreceptors and Phototropism • Measuring the Time: Photoperiodism and Circadian Clock • Flowering Development • Plant Senescence and Cell Death <p><i>Quiz-based Discussion</i></p>
Unit IV: Plant Hormones	
<ul style="list-style-type: none"> • Plant Hormones (I): Auxin, Gibberellins and Cytokinins • Plant Hormones (II): Abscisic Acid, Ethylene and Bassinosteroids • Plant Hormones (III): Jasmonic Acid, Salicylic Acid, and Strigolactones, Peptide hormones 	
Final Exam	
六、成績考核	<p>課堂上參與小組討論與口頭報告 (quiz-based presentation: 30%)</p> <p>期中考(midterm exam: 30%)</p> <p>期末考(final exam: 30%)</p> <p>隨堂小考(in-class quiz: 10%)</p>
七、講義位址 http://	NTHU eeclass