

## 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"> <li>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.</li> <li>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.</li> <li>To provide a broad framework for the students who are interested in pursuing advanced study in plant physiology.</li> </ol>
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"> <li>Taiz L., Zeiger E., Møller I. M., Angus M., (2022) Plant Physiology and Development. 7th ed. Sinauer Associates, Inc.</li> <li>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.</li> </ol>
四、教學方式	<ol style="list-style-type: none"> <li>主要由任課老師講解學習內容</li> <li>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為學習成果評量(共三次，評量分數加總占總成績 30%)</li> <li>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</li> </ol>

<p>五、教學進度</p>	<p><b>Unit I: Plant Cell, Movement of Water and Nutrients</b></p> <ul style="list-style-type: none"> <li>• Plant Growth and Plant Cell Wall</li> <li>• Plant water relations at the cell and the whole-plant level</li> <li>• Roots, Soils, and Nutrient Uptake</li> <li>• Vascular Tissues and Solutes Transport</li> <li>• Mineral Nutrients</li> </ul> <p><u>Quiz-based Discussion</u></p> <p><b>Unit II: Photosynthesis</b></p> <ul style="list-style-type: none"> <li>• Photosynthesis: Harvesting Sunlight</li> <li>• Photosynthesis: CO<sub>2</sub> Assimilation</li> <li>• Allocation, Translocation and Partitioning of Photoassimilates</li> <li>• Cellular Respiration: Unlocking the Energy Stored in Photoassimilates</li> <li>• Production and Storage of Secondary Metabolites</li> </ul> <p><u>Quiz-based Discussion</u></p> <hr/> <p><b>Midterm exam</b></p> <hr/> <p><b>Unit III: Plant Development</b>  <b>Seed Dormancy, Germination, and Seedling Establishment</b></p> <ul style="list-style-type: none"> <li>• Responding to Light: Photoreceptors and Phototropism</li> <li>• Measuring the Time: Photoperiodism and Circadian Clock</li> <li>• Flowering Development</li> <li>• Plant Senescence and Cell Death</li> </ul> <p><u>Quiz-based Discussion</u></p> <p><b>Unit IV: Plant Hormones</b></p> <ul style="list-style-type: none"> <li>• Plant Hormones (I): Auxin, Gibberellins and Cytokinins</li> <li>• Plant Hormones (II): Abscisic Acid, Ethylene and Brassinosteroids</li> <li>• Plant Hormones (III): Jasmonic Acid, Salicylic Acid, and Strigolactones, Peptide hormones</li> </ul> <hr/> <p><b>Final Exam</b></p>
<p>六、成績考核</p>	<p>課堂上參與小組討論與口頭報告 (quiz-based presentation: 30%)          期中考(midterm exam: 30%)          期末考(final exam: 30%)          隨堂小考(in-class quiz: 10%)</p>
<p>七、講義位址 http://</p>	<p>NTHU eeclass</p>