

## 國立清華大學 109 學年第 1 學期新開課程課程大綱

科號	10910LS 312100	組別		學分	3	人數限制	45
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>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.</li> <li>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.</li> <li>3. 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>1. Taiz L., Zeiger E., Møller I. M., Angus M., (2015) Plant Physiology and Development. 6th ed. Sinauer Associates, Inc.</li> <li>2. Jane B Reece, Lisa A Urry, Michael L Cain, Steven A Wasserman, Peter V Minorsky, Robert B Jackson. (2013) Campbell Biology. 10 ed. Benjamin Cummings, Inc.</li> </ol>
四、教學方式	<ol style="list-style-type: none"> <li>1. 主要由任課老師講解學習內容</li> <li>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)，培養學生主動學習以及獨立思考的能力，並按組員個別參與分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> </ol>
五、教學進度	<p><b>Unit I: Plant Cell, Movement of Water and Nutrients</b></p> <ol style="list-style-type: none"> <li>1. Plant Growth and Plant Cell Wall</li> <li>2. Plant water relations at the cell and the whole-plant level</li> <li>3. Roots, Soils, and Nutrient Uptake</li> <li>4. Vascular Tissues and Solutes Transport</li> <li>5. Mineral Nutrients</li> </ol> <p><u>Quiz-based Discussion</u></p>

	<p><b>Unit II: Photosynthesis</b></p> <ol style="list-style-type: none"> <li>6. Photosynthesis: Harvesting Sunlight</li> <li>7. Photosynthesis: CO<sub>2</sub> Assimilation</li> <li>8. Allocation, Translocation and Partitioning of Photoassimilates</li> <li>9. Cellular Respiration: Unlocking the Energy Stored in Photoassimilates</li> <li>10. Production and Storage of Secondary Metabolites</li> </ol> <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> <ol style="list-style-type: none"> <li>11. Responding to Light: Photoreceptors and Phototropism</li> <li>12. Measuring the Time: Photoperiodism and Circadian Clock</li> <li>13. Flowering Development</li> <li>14. Plant Senescence and Cell Death</li> </ol> <p><u>Quiz-based Discussion</u></p> <hr/> <p><b>Unit IV: Plant Hormones</b></p> <ol style="list-style-type: none"> <li>15. Plant Hormones (I): Auxin, Gibberellins and Cytokinins</li> <li>16. Plant Hormones (II): Abscisic Acid, Ethylene and Brassinosteroids</li> <li>17. Plant Hormones (III): Jasmonic Acid, Salicylic Acid, and Strigolactones, Peptide hormones</li> </ol> <hr/> <p><b>Final Exam</b></p>
六、成績考核	<p>課堂上參與小組討論與口頭報告 (quiz-based presentation: 36%)</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: 14%)</p>
七、講義位址 http://	iLMS