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課號 Course Number	LS2014
班次 Class	*
科目名稱(中文) Course Title(in Chinese)	植物生理學實驗
科目名稱(外文) Course Title(In English or other languages)	Plant Physiology Laboratory
授課老師(中文) Instructor(in Chinese)	吳少傑,葉靖輝,陸重安
授課老師(外文) Instructor(In English or other languages)	Shaw-Jye Wu, Ching-Hui Yeh, Chung-An Lu
辦公時間(中文) Office Hour(in Chinese)	13:00 ~ 14:00/星期四
辦公時間(外文) Office Hour(In English or other languages)	Thursday 13:00 ~ 14:00
課程目標(中文) Course Objective(in Chinese)	<ol style="list-style-type: none"> 1. 讓學生有更多的時間親自觀察與操作，印證課堂上的理論，以期對所得的知識獲得更明確深刻與具體的理解。 2. 加強同學對植物生理學的瞭解。 3. 藉由學習基本植物生理學的實驗技術，幫助同學建立最基本的認知，有助於未來的研究工作。
課程目標(外文) Course Objective(In English or other languages)	<ol style="list-style-type: none"> 1. To demonstrate basic concepts of plant physiology. 2. To teach simple laboratory techniques and data analysis in plant physiology. 3. To teach observation and interpretation of biological phenomena. 4. To teach the scientific method, specifically formulation and testing of hypotheses. 5. To make a contribution to plant physiology in the form of phenotype data for an Arabidopsis mutant.
授課內容(中文) Course Description(in Chinese)	<p>Week 1. Introduction</p> <p>Week 2. Chemical and medium preparation I</p> <p>Week 3. Separation of chloroplasts and Hill reaction</p> <p>Week 4. Detection of products of photosynthesis</p> <p>Week 5. Protoplast preparation and gene transformation</p> <p>Week 6. Activity and effects of plant catalase</p> <p>Week 7. Chemical and medium preparation II</p> <p>Week 8. Detection of sugar types</p> <p>Week 9. Mid-term exam</p> <p>Week 10. Measurement of sugar content</p> <p>Week 11. GA induce alpha amylase</p> <p>Week 12. Effects of GA in seed germination</p> <p>Week 13. Effects of Absciscic acid (ABA) in seed germination</p>

	Week 14. Effects of ethylene in seed germination Week 15. Salinity and plant growth Week 16. Detection of seed viability by TTC assay Week 17. Chlorophyll and lipid peroxide contents in plants under heat stress Week 18. Final exam
授課內容(外文) Course Description(In English or other languages)	Week 1. Introduction Week 2. Chemical and medium preparation I Week 3. Separation of chloroplasts and Hill reaction Week 4. Detection of products of photosynthesis Week 5. Protoplast preparation and gene transformation Week 6. Activity and effects of plant catalase Week 7. Chemical and medium preparation II Week 8. Detection of sugar types Week 9. Mid-term exam Week 10. Measurement of sugar content Week 11. GA induce alpha amylase Week 12. Effects of GA in seed germination Week 13. Effects of Absciscic acid (ABA) in seed germination Week 14. Effects of ethylene in seed germination Week 15. Salinity and plant growth Week 16. Detection of seed viability by TTC assay Week 17. Chlorophyll and lipid peroxide contents in plants under heat stress Week 18. Final exam
教科書/參考書(中文) Textbook/References(in Chinese)	實驗講義
教科書/參考書(外文) Textbook/References(In English or other languages)	Self-compiled textbook
自編教材比例 Self-compiled Textbook/References Proportion	100%
授課方式 Requirements	講授Lecture 實習/實驗Internship/Experiment
評量配分比重(中文) Grading(in Chinese)	1. 出席 (10%) 2. 課堂表現 (10%) 3. 作業與報告 (80%)
評量配分比重(外文) Grading(In English or other languages)	1. Attendance 10% 2. Lab performance 10% 3. Experimental reports 80%
課程所屬學制 Educational System	學士班(Undergraduate Programme)
課程領域 Course Domain	基礎學科
跨系課程領域 Cross Department Course Domain	

系所核心能力 Core Competencies of Department	強度指數 Overall Rating						評量方式 Corresponding Assessments
	0 不具 備 Zero	1 非常 低 Very Low	2 低 Low	3 普通 Medium	4 高 High	5 非常 高 Very High	
基礎生物專業知識 Basic Biological Sciences	●	●	●	●	●	●	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習(Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input checked="" type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input checked="" type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量(Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評(Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)
發掘問題及實驗能力 Question approaching and experimental skills	●	●	●	●	●	●	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習(Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input checked="" type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input checked="" type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量(Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評(Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)

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邏輯分析 Logical thinking and analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習(Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input checked="" type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input checked="" type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量(Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評(Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)
電腦應用 Computer application	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習(Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input checked="" type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input checked="" type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量(Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評(Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)

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	0 不具 備 Zero	1 非常 低 Very Low	2 低 Low	3 普通 Medium	4 高 High	5 非常 高 Very High	
溝通技巧 Communication skills							<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習(Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input checked="" type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input checked="" type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量(Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評(Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)
獨立思考與自我學習 Independent thinking and self-learning							<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習(Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input checked="" type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input checked="" type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量(Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評(Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)

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團隊合作 Team work							<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習(Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input checked="" type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input checked="" type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量(Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評(Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)
博雅通識 General knowledge							<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習(Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input checked="" type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input checked="" type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量(Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評(Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)