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開課班級: 碩熱農一A

授課老師: 陳光堯

學分數: 3

課程大綱:

本課程在教授生物物理及生物化學在植物生理及生態上之應用，同時強調環境控制在農業研究上之重要性及其相關技術之運用；主要內容包括植物體與環境間各種形式之物質及能量的交換，如水份、二氧化碳之擴散方式、平衡分析與能量運用等。

outline:

This course is designed to provide students with the basic knowledge of the applications of biophysics and biochemistry on plant physiology and ecology. The importance of a “controlled environment” and the technology of “environmental control” will also be covered. Its contents include: diffusion; chemical and energy potential gradients; solute movement in and out of plant cells; the interconnection of various energy forms; and energy and matter exchange between plant and environment (water vapor and carbon dioxide, energy budget analysis, and water movement from soil to plant to atmosphere).

教學型態:

課堂教學

成績考核方式:

平時成績: %

期中考: 30%

期末考: 30%

其它: Group

work/Discussion/Presentation
30%; Attendance 10%

本科目教學目標:

1. 培育熱帶農業專業人才。 To provide professional knowledge in tropical Agriculture.
2. 提升農業專業知識與獨立研究能力。 To conduct in independent research and to contribute knowledge in agriculture-related fields.
3. 促進國際農業發展與技術移轉。 To train and educate senior level professionals to conduct research.

參考書目:

- (1) Physicochemical and Environmental Plant Physiology, 5th Edition. 2020 Park S. Nobel, Academic Press,
<https://www.elsevier.com/books/physicochemical-and-environmental-plant-physiology/nobel/978-0-12-819146-0> (2) Plants and Microclimate: A Quantitative Approach to Environmental Plant Physiology, 3rd Ed., 2013 Hamlyn G. Jones, Cambridge University Press
<https://www.cambridge.org/tw/academic/subjects/life-sciences/plant-science/plants-and-microclimate-quantitative-approach-environmental-plant-physiology-3rd-edition?format=PB>



課程進度表：

週次	起訖月日	授課單元(內容)	備註
第1週	9.11~9.18	Topic 0:General introduction	19日正式上課。19~23日加退選，復(轉)學生及延修生選課，雙主修、輔系申請，23日申辦抵免學分截止日
第2週	9.18~9.25	Topic Discussion: A quantitative approach (diffusion!) ;	28日和平紀念日(放假)
第3週	9.25~10.02	HOLIDAY;(Mid-Autumn Festival, no class!)	
第4週	10.02~10.09	; Topic 1: Radiation: Duality of light; Photochemistry of photosynthesis Radiation source in controlled environment ; Topic Discussion &; Practice in Radiation Measurement ; ;	11日成績優異提前畢業者提出申請截止日,14日第1次校教評會
第5週	10.09~10.16	; Topic 2: Temperature and Relative Humidity: Temperature and relative humidity in controlled environment Energy budget 1:;Net radiation balance of an exposed lea ; ;	
第6週	10.16~10.23	Topic 2: Temperature and Relative Humidity: ; Energy budget 2:;Sensible Heat (Conduction/Convection) &;Latent Heat (Transpiration/Condensation)T Table 7-1!; (Physicochemical and Environmental Plant Physiology) ; ;	
第7週	10.23~10.30	Topic 3: Water and Nutrition Management Water management and nutrient supply in controlled growing systems	3日(三)校慶補假(112年11月25(六)日校慶活動日)。4日(四)兒童節、民族掃墓節(放假)，5日(五)民族掃墓節補假
第8週	10.30~11.06	Topic discussion/Practice in water management	10日校課程委員會。11日第2次校教評會
第9週	11.06~11.13	MIDTERM EXAM	15~21日期中考試
第10週	11.13~11.20	Topic 4: Air Movement Wind and carbon dioxide in controlled-environment systems	22~26日學士班申請轉系,27~28日四技二專統一入學測驗,28日教師期中成績上網登錄截止日
第11週	11.20~11.27	Topic 5:;Carbon Nutrition Carbon nutrition and it ' s fixation in micropropagated systems	
第12週	11.27~12.04	Topic Discussion/Practice in CO2 monitoring	11日多益測驗(暫定)
第13週	12.04~12.11	Topic 6:;Image Analysis Evaluation of physiological processes with image analysis Automated systems for tissue culture	16日第3次校教評會。19日博士班招生(暫定)
第14週	12.11~12.18	Topic Discussion	20~24日體育運動週，22日水上運動會(暫定),24日申請停修



			課程截止
第15週	12.18~12.25	Topic 7:;Data Collection (Environmental measurement and data logging)	27~ 31日藥物濫用防制宣導週
第16週	12.25~1.01	Field trip/Practice in measuring and data logging Greenhouse Environment Control & Automation	3日校務會議。3~9日畢業班(學士)期末考試。
第17週	1.01~1.08	Result presentation	10日端午節(放假), 12日畢業班授課教師送交學期成績截止
第18週	1.08~1.15	FINAL EXAM	17~23日期末考試