



《尊重智慧財產權，請使用正版教科書，勿非法影印書籍及教材，以免侵犯他人著作權》

開課班級：四熱農三A

授課老師：邱亞伯

學分數：3

課程大綱：

講授以應用微生物的醱酵技術製造各種發酵產品之生產技術，如酒類工業、有機酸工業、發酵食品工業、胺基酸工業、酵素工業、菌體生產工業、抗生物質工業、核酸相關物質工業、微生物轉換醱酵工業、生理活性物質生產工業等，以及利用微生物之醱酵技術於培養植物細胞生產有用物質與生產細胞的方法。

使學生練習生產單細胞蛋白質之培養技術、酒精醱酵技術、有機酸醱酵技術、胺基酸醱酵技術、酵素生產醱酵技術、抗生物質生產技術、醱酵食品製造之技術以及培養植物細胞生產有用物質與大量生產有用細胞之培養技術等。

outline:

The course based on the knowledge of applied microbiology to discuss the related fermentation industry: brewing, organic acids, food fermentation, amino acids, enzymes, antibiotic, etc. The course also covered the technique of cell production. The lab covers the single cell protein, technique in alcohol fermentation, amino acids, enzymes, antibiotics production and food fermentation, and the cell production technique.

教學型態:

課堂教學+實習 (校內、校外)

成績考核方式:

平時成績:50%
期中考:15%
期末考:20%
其它:15% - Attendance
Record%

本科目教學目標:

- 1.培育熱帶農業基礎人才。
- 2.發展農、林、漁、牧相關技術。
- 3.建立永續農業經營與國際合作觀。

參考書目:



課程進度表：

週次	起訖月日	授課單元(內容)	備註
第1週	2.21~2.28	Course Introduction	8日正式上課。8~12日課程加退選，轉學(系)生、復學生及延修生選課，雙主修、輔系申請，12日申辦抵免學分截止日
第2週	2.28~3.07	Lecture:;Introduction and History of Food Fermentation Lecture: Biochemistry of Fermentation	
第3週	3.07~3.14	Lecture: Alcohol Fermentation Fermentation Lab: Brewing of Beer Group 1 - Light Lager Group 2 - Light Lager Group 3 - Dark Lager Group 4 - Dark Lager Fermentation Lab:;Yeast gas production method (Groups 5-8)	28日(日)孔子誕辰紀念日/教師節(放假),29日(一)補假
第4週	3.14~3.21	Lecture: Alcohol Fermentation Fermentation Lab: Brewing of Beer Group 5 - Black Beer; Group 6 - Black Beer; Group 7 - Pale Ale (English Bitters) Beer; Group 8 - Pale Ale (English Bitters) Beer; Fermentation Lab:;Yeast gas production method (Groups 1-4)	29日成績優異提前畢業者提出申請截止日
第5週	3.21~3.28	Lecture: Lactic Acid Fermentation;(& Vegetable Fermentation) Fermentation Lab: Baking of Sourdough Weeks 17 & 18;Makeup Class; for Group 4 - ;March 26th (Sat.); 9AM - 4PM	6日(一)中秋節(放假)，10日(五)國慶日(放假)
第6週	3.28~4.04	Fermentation;Lab: How to make Yoghurt Fermentation Lab: How to make Cream;Cheese	14日學生宿舍安全輔導暨複合式防災疏散演練。18日多益測驗
第7週	4.04~4.11	No Classes Course Exams (Take Home)	24日(五)補假，25日(六)光復暨古寧頭大捷日(放假)。
第8週	4.11~4.18	Fermentation Lab: Processing of Hot sauce;	30日校課程委員會
第9週	4.18~4.25	Mid-Semester Exams: Lab: Sensory Evaluation / Analysis of Brewed Products	3~9日期中考試



第10週	4.25~5.02	Fermentation Lab: Processing of Kombucha	13日教務會議,16日教師期中成績上網登錄截止日
第11週	5.02~5.09	Lecture:;Applied Food Microbiology & Spoilage OR Tentative Field Trip	
第12週	5.09~5.16	In-Class Activity: Student Presentations: Fermented Foods Around the World Presentation Time: 30 minutesQ&A: 15 minutes Group 1 - Fermented Foods from Egypt Group 3 - Fermented Foods from Japan Group 5 - Fermented Foods from Maylasia/ Thailand Group 7 -;Fermented Foods from Belize	24~28體育運動週。24日校園路跑。27日運動大會夜間開幕，28日運動大會活動，29日101週年校慶活動日，照常上班
第13週	5.16~5.23	;In-Class Activity: Student Presentations: Fermented Foods Around the World Presentation Time: 30 minutesQ&A: 15 minutes Group 2 - Fermented Foods from France Group 4 - Fermented Foods from United Kingdom Group 6 - Fermented Foods from India Group 8 -;Fermented Foods from Egypt	
第14週	5.23~5.30	In-Class Activities Video Presentation: Bioprocessing;Purification How to Make KimchiAfter watching the 2nd video, students are invited to make Kimchi at home (from scratch).; We discuss the details during the virtual class session.	12日申請停修課程截止日
第15週	5.30~6.06	Fermentation;Lab: Bakery Foods Lab (Provided by Students) Group 1 - Brownie Group 2 -; Chicken pasta Bake Group 3 - Banana Bread Group 4 - Sourdough Group 5 - Kuih Serimuka (Baked Glutinous rice) Group 6 -; Banana Bread Group 7 -; Cinammon Roll Group 8 -; Muffin ; ;	
第16週	6.06~6.13	Lab: (Group Activity)Select/prepare a	22日校務會議。25日行憲紀



		fermented product Group 1 - Fruit Vinegar Group 2 - Pickles Group 3 - Pita Group 4 - Pizza Group 5 - Chinese Fritters/ Group 6 - Naan/pickle Group 7 - Hot Sauce Processing Group 8 - White Toast	念日(放假)
第17週	6.13~6.20	Pre-Final Exams: In-Class (3rd Year Students) Senior Students;(Group 4);Makeup Class; ; - Week 5;; March 26th (Sat.); 9AM - 4PM	1日(四)開國紀念日(放假)
第18週	6.20~6.27	Final Exams: Senior Students;(Group 4);Makeup Class; - Week 5;; March 26th (Sat.); 9AM - 4PM	5~11日期末考試，10~11日學生退宿