開課班級: 博觀賞魚專班二A **授課老師: 劉俊廷** **學分數: 2**

課程大綱:

海洋生物技術2(含實習)為一門針對水生動物食用添加劑之科學及其效果驗證方法的課程。本課程包含正課與實作部分，正課主要包含各類水生動物用飼料添加劑的介紹與其功能的闡述；實作部分則主要聚焦於免疫學相關解驗方法的實作與檢驗樣品的採集。透過研習本課程，期望建立學生對常用及特殊目的飼料添加劑的使用能建立完整的認知，更能夠針對欲改善或促進之功效，使用多種方法驗證添加劑使用後之效果。

outline:

Marine Biotechnology 2 (including internship), offers an in-depth exploration of the science behind food additives for aquatic animals and the methods used to verify their effectiveness. The course encompasses lectures to elucidate knowledge and functions of a diverse range of aquatic animal feed additives and practical components focus on implementing immunology-related assays and acquiring animal samples. Upon completion of the course, students are expected to possess a comprehensive understanding of both common and specialized feed additives in aquaculture and acquire the various laboratory skills necessary to assess the efficacy of additives to specific desired outcomes.

教學型態:

課堂教學+實習 (校內、校外)

成績考核方式:

平時成績:20%
期中考:35%
期末考:45%
其它:%

本科目教學目標:

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	9.09~9.16	Introduction to Aquatic Animal Feed Additives Overview of the course objectives	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	9.16~9.23	Important Immune-Related Enzyme and Protein in Aquatic Animals Understanding key enzymes and proteins involved in the immune system of aquatic animals	
第3週	9.23~9.30	Practice: Superoxide Dismutase (SOD) Activity Assay Test SOD change in fish macrophage	28日(日)孔子誕辰紀念日/教師節(放假),29日(一)補假
第4週	9.30~10.07	Probiotics and Prebiotics	29日成績優異提前畢業者提出申請截止日
第5週	10.07~10.14	Practice: Photosynthetic Bacteria Culture	6日(一)中秋節(放假)，10日(五)國慶日(放假)
第6週	10.14~10.21	Enzymes as Feed Additives Types of enzymes used in aquaculture feeds Functions and benefits	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	10.21~10.28	Practice: Cytotoxicity Assay Applying cytotoxicity assays, e.g., AlamarBlue, CCK-8, or MTT, to assess the safety and efficacy of feed additive.	24日(五)補假，25日(六)光復暨古寧頭大捷日(放假)。
第8週	10.28~11.04	Practice: fish blood, shrimp, or clam hemolymph extraction Practice withdrawing blood from fish or hemolymph from white leg shrimp or bivalve clam	30日校課程委員會
第9週	11.04~11.11	Midterm Exam (presentation)	3~9日期中考試
第10週	11.11~11.18	Practice: Lysozyme examination Test lysozyme concentration change in cell, cultural supernatant and fish serum.	13日教務會議,16日教師期中成績上網登錄截止日
第11週	11.18~11.25	Practice: Respiratory Burst Activity Assay Test fish macrophage respiratory burst activity	
第12週	11.25~12.02	Minerals and Vitamins as Additive Importance of minerals and vitamins in aquatic animal nutrition Deficiency symptoms and their impact on immunity	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	12.02~12.09	Practice: Macrophage Phagocytosis	

		Examination Laboratory session on evaluating fish macrophage phagocytosis activity	
第14週	12.09~12.16	Herbal and Botanical Additives (1) Overview of herbal and botanical additives Active compounds and their effects on immunity	12日申請停修課程截止日
第15週	12.16~12.23	Herbal and Botanical Additives (2) Related research paper review and discussion	
第16週	12.23~12.30	Additive for Improve Appetite of Aquatic Animal or;Methods to deliver food additive Feed additives aimed at enhancing appetite and feed intake ;to faster the weight-gaining in aquatic species	22日校務會議。25日行憲紀念日(放假)
第17週	12.30~1.06	Practice: Brine shrimp enrichment Enrich nutrition of brine shrimp to deliver chemicals into fish larvae.	1日(四)開國紀念日(放假)
第18週	1.06~1.13	Final Exam (Student Presentations)	5~11日期末考試，10~11日學生退宿