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國立高雄科技大學
NATIONAL KAOHSIUNG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY

授課大綱 Syllabus

部別：日間部博士

112學年度第2學期

列印日期：2024/03/01

中文課程名稱：微生物代謝	英文課程名稱：Microbial Metabolism	授課教師：PATEL ANIL K.
開課班級：水產科技博班二甲	學分：3.0	授課時數：3.0
合班班級：		實習時數：0.0

1. 中文教學目標(Chinese Teaching objectives)
To develop the basic concepts of microbial metabolism and teach biochemistry and the fate of nutrients for energy, growth, and reproduction through deep scientific learning on the subject. It is a driving force behind the development and maintenance of the planet's biosphere. In-depth insight and understanding of microbial metabolism would establish the platform for studying microbial exploitation for innovative industrial applications, broadening the scope of microbes for new substrate platforms, regulating their growth and reproduction for enhanced biomass and value products, emerging or novel product development etc. Hence microbial cultivation regimes can be improved and the approach can be extended for real-world application.

2. 英文教學目標(English Teaching objectives)
To develop the basic concepts of microbial metabolism and teach biochemistry and the fate of nutrients for energy, growth, and reproduction through deep scientific learning on the subject. It is a driving force behind the development and maintenance of the planet's biosphere. In-depth insight and understanding of microbial metabolism would establish the platform for studying microbial exploitation for innovative industrial applications, broadening the scope of microbes for new substrate platforms, regulating their growth and reproduction for enhanced biomass and value products, emerging or novel product development etc. Hence microbial cultivation regimes can be improved and the approach can be extended for real-world application.

3. 中文教學綱要(Chinese CourseDescription)
This course "Microbial metabolism " will be conducted fully in English. The course content includes types of metabolisms, metabolic cycles, energy production, storage and use, fermentation, anaerobic respiration catabolisms, anabolisms or biosynthesis of molecules. Moreover, detailed technical aspects and engineering aspects of cellular respiration, catabolisms of lipid, protein, carbohydrates etc. The teaching materials are self-produced ppt slides, and the way of teaching is classroom instructions.

4. 英文教學綱要(English CourseDescription)
This course "Microbial metabolism " will be conducted fully in English. The course content includes types of metabolisms, metabolic cycles, energy production, storage and use, fermentation, anaerobic respiration catabolisms, anabolisms or biosynthesis of molecules. Moreover, detailed technical aspects and engineering aspects of cellular respiration, catabolisms of lipid, protein, carbohydrates etc. The teaching materials are self-produced ppt slides, and the way of teaching is classroom instructions.

5. 中文核心能力	
核心能力名稱	核心能力百分比
1 生物資源永續	25%
2 產銷管理能力	25%
3 整合與研究能力	25%
4 創新溝通能力	25%

6. 英文核心能力

核心能力名稱	核心能力百分比
1 Biological resource sustainability	25%
2 Production and sales management capabilities	25%
3 Integration and research skills	25%
4 Innovative communication skills	25%

7. 教科書

中文書名：自編講義 英文書名：Self-produced handouts

中文作者： 英文作者：

1 中文出版社： 英文出版社：

出版日期：年 月 備註：

8. 參考書

中文書名：略 英文書名：Skip

中文作者： 英文作者：

1 中文出版社： 英文出版社：

出版日期：年 月 備註：

9. 教學進度表

週次或項目 Week or Items	中文授課內容 Chinese Course Content	英文授課內容 English Course Content	分配節次 Assigned Classes	備註 Note
1	Introduction of metabolisms: types of metabolisms	Introduction of metabolisms: types of metabolisms	3	
2	Metabolic cycles: glycolysis, Krebs etc.	Metabolic cycles: glycolysis, Krebs etc.	3	
3	energy production, storage and use	energy production, storage and use	3	
4	Lab assignment I/exercise I	Lab assignment I/exercise I	3	
5	Fermentation and anaerobic respiration	Fermentation and anaerobic respiration	3	
6	Cellular respiration	Cellular respiration	3	
7	Catabolisms of lipid	Catabolisms of lipid	3	
8	Lab assignment II/exercise II	Lab assignment II/exercise II	3	
9	Catabolisms of protein	Catabolisms of protein	3	

10	Catabolisms of carbohydrates	Catabolisms of carbohydrates	3
11	Midterm exam	Midterm exam	3
12	Chemolithotrophy, phototrophy, heterotrophy	Chemolithotrophy, phototrophy, heterotrophy	3
13	Lab assignment III/exercise III	Lab assignment III/exercise III	3
14	anabolisms or biosynthesis of molecules	anabolisms or biosynthesis of molecules	3
15	Growth with various organic carbon sources	Growth with various organic carbon sources	3
16	Nitrogen fixation	Nitrogen fixation	3
17	Biogeochemical cycles	Biogeochemical cycles	3
18	Final exam	Final exam	3

10. 中文成績評定(Chinese Evaluation method)

Attendance, quiz, homework, and the mid-/final- exams

11. 英文成績評定(English Evaluation method)

Attendance, quiz, homework, and the mid-/final- exams

12. 中文課堂要求(Chinese Classroom requirements)

Projector/online teaching setup

13. 英文課堂要求(English Classroom requirements)

Projector/online teaching setup

14. 本課程與SDGs相關項目(This course is relevant to these of SDGs as following)

「遵守智慧財產權」；「不得非法影印」！