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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：木質纖維素生物質之生 物煉製	英文課程名稱：Biorefinery of Lignocellulosic Biomass	授課教師：SINGHANIA R.R
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)**

Establish a basic concept of “Biorefinery of LC Biomass” and develop an appropriate attitude towards scientific learning. To establish the basic routes for biorefinery to obtain value added products. Establish the basic knowledge and skill to conduct scientific research related to biorefinery.

**2. 英文教學目標(English Teaching objectives)**

Establish a basic concept of “Biorefinery of LC Biomass” and develop an appropriate attitude towards scientific learning. To establish the basic routes for biorefinery to obtain value added products. Establish the basic knowledge and skill to conduct scientific research related to biorefinery.

**3. 中文教學綱要(Chinese CourseDescription)**

This course of ‘Biorefinery of Lignocellulosic Biomass’ will be conducted completely in English. This course content will include fractionation of biomass into its components via various routes including biological as well as thermochemical routes. Various value-added compounds including bioethanol, platform chemicals will be discussed. The teaching materials will be self-produced handouts and teaching method is classroom instructions.

**4. 英文教學綱要(English CourseDescription)**

This course of ‘Biorefinery of Lignocellulosic Biomass’ will be conducted completely in English. This course content will include fractionation of biomass into its components via various routes including biological as well as thermochemical routes. Various value-added compounds including bioethanol, platform chemicals will be discussed. The teaching materials will be self-produced handouts and teaching method 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：自編教材 英文書名：self-product 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： 英文書名：Current Developments in Solid-state Fermentation (Springer)

中文作者： 英文作者：Pandey A, Fernandes, M, Larroche, C

1 中文出版社： 英文出版社：Eds

出版日期：年 月 備註：

中文書名： 英文書名：Current Developments in Biotechnology and Bioengineering, 1st Edition

中文作者： 英文作者：Pandey, A and Teixeira, J.A.

2 中文出版社： 英文出版社：Eds

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 biorefinery	Introduction of biorefinery	3	
2	Biorefinery Vs petro-refinery	Biorefinery Vs petro-refinery	3	
3	Structure and components of biomass (Lignin, cellulose and hemicellulose)	Structure and components of biomass (Lignin, cellulose and hemicellulose)	3	
4	Lab assignment I/exercise I	Lab assignment I/exercise I	3	
5	Recalcitrance nature of biomass and its major reasons. Steps of biorefinery for biological routes	Recalcitrance nature of biomass and its major reasons. Steps of biorefinery for biological routes	3	
6	Pretreatment strategies	Pretreatment strategies	3	
7	Enzymes employed for hydrolyzing polymers of biomass into its monomers (actions)	Enzymes employed for hydrolyzing polymers of biomass into its monomers (actions)	3	
8	Mid Examination	Mid Examination	3	

9	Monomers to products via microbial interventions	Monomers to products via microbial interventions	3
10	Platform chemicals and and its applications	Platform chemicals and and its applications	3
11	Lab assignment II/exercise II	Lab assignment II/exercise II	3
12	Thermochemical routes for Biorefinery	Thermochemical routes for Biorefinery	3
13	Products of Pyrolysis and its applications	Products of Pyrolysis and its applications	3
14	Difference between torrefaction and pyrolysis	Difference between torrefaction and pyrolysis	3
15	Lab assignment III/exercise III	Lab assignment III/exercise III	3
16	Environmental sustainability related to biorefinery	Environmental sustainability related to biorefinery	3
17	Advantages and Disadvantages of various biorefinery routes	Advantages and Disadvantages of various biorefinery routes	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.)

3. 良好健康和福祉(Good Health and Well Being);7. 可負擔的潔淨能源(Affordable and Clean Energy);

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