SEE8128 Renewable Resources for Biorefinery

Course Title: Renewable Resources for Biorefinery
Course Code: SEE8128
Course Duration: One semester
Credit Units: 3
Level: R8
Medium of Instruction: English
Prerequisites: N/A
Precursors: N/A
Equivalent Courses: N/A
Exclusive Courses: N/A

Course Aims

This course aims to introduce the integrated and interdisciplinary approach required in modern biotechnology. It presents an overview of the use of bioresources in the 21st century for the manufacture of major chemical and material products. It covers the use of conversion technologies of biomass as a renewable resource to produce bioenergy in a sustainable way, mainly in the form of liquid and gaseous biofuels. Also, it gives a broad overview of biofuel developments from both a technical and an economical angle.

Course Intended Learning Outcomes (CILOs)

(state what the student is expected to be able to do at the end of the course according to a given standard of performance)

Upon successful completion of this course, students should be able to:

No.	CILOs	Weighting (if applicable)
1.	Gain a thorough knowledge of the biological and chemical methods which are important part of the biorefinery tool kit.	4
2.	Familiarise with the innovative biorefinery concept and the direct conversion of biomass into useful products including high value chemicals and biofuels.	3
3.	Integrates the biotechnological base disciplines, together with the environmental, safety, health, quality and sustainability aspects, and takes into account the technological as well as the economical feasibility and reliability.	2
4.	Creates life-cycle analysis using green biochemical technologies for transformation of natural substrate into green and sustainable products.	1

Teaching and Learning Activities (TLAs)

(Indicative of likely activities and tasks designed to facilitate students' achievement of the CILOs. Final details will be provided to students in their first week of attendance in this course)

CILO No.	TLAs	Hours/week (if applicable)
CILO 1	Lecture; Tutorials	1.5
CILO 2	Lecture; Tutorials	0.5
CILO 3	Lecture; Tutorials	0.5
CILO 4	Lecture; Tutorials	0.5

Assessment Tasks/Activities

(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs. Final details will be provided to students in their first week of attendance in this course)

CILO No.	Type of Assessment Tasks/Activities	Weighting (if applicable)	Remarks
CILO 1	Examination (20%); Assignments (10%)	30%	
CILO 2	Examination (20%); Assignments (20%)	40%	
CILO 3	Examination (15%); Assignments (5%)	20%	
CILO 4	Examination (5%); Assignments (5%)	10%	

Grading of Student Achievement: Refer to Grading of Courses in the Academic Regulations (Attachment) and to the Explanatory Notes.

Part III

Keyword Syllabus

Fermentation Biocatalysis Downstream processing Biotechnology

Biofuels Bioproducts Biorefinery

Recommended Reading

Text(s)

1. Soetaert W, Vandamme EJ. Industrial Biotechnology - Sustainable Growth and Economic Success. Gent, Belgium: Wiley-VCH 2011.

2. Clark JH, Deswarte F. Introduction to Chemicals from Biomass. Stevens CV, editor. York, United Kingdom: Wiley; 2008.

3. Stuart PR, El-Halwaqi MM. Integrated Biorefineries: Design, Analysis and Optimization (Green Chemistry and Chemical Engineering) 2012.