



Philadelphia University

Faculty of Engineering - Department of Renewable Energy
Engineering
First Semester 2024/2025

Course Information

Title:	Bioenergy systems (611541)
Prerequisite:	Introduction to renewable energy (0611341)
Credit Hours:	3 credit hours (16 weeks per semester, approximately 45 contact hours)
Textbook:	Biofuels engineering process technology, by Caye Drapcho, Nghiem Phu Nhuan, Terry Walker, 2020
References:	• Our energy future: introduction to renewable energy and biofuels, By C.S Jones and S.P. Mayfield. • Biorenewable resources engineering: new products from agriculture, Robert C. Brown and Tristan R. Brown • https://www.iea.org/ • https://www.energy.gov/
Catalog Description:	This is an elective course for the Renewable Energy Engineering Students. Bioenergy is a renewable energy extracted or produced from biological sources, with an end result as gas, liquid, or solid fuels. With the diminishing supply and rising prices of fossil fuel, bioenergy arises as one of the most important renewable energy source of the future and is experiencing rapid growth.
Website:	https://www.philadelphia.edu.jo/academics/zalmuala/
Instructor:	Dr. Zaid Al Muala Email: zalmuala@philadelphia.edu.jo Office: Engineering building, room 6714, ext:2450. Office hours: Sat.: 09:10 - 11:10 Sun.: 10:10 - 11:10 & 12:40 - 13:40 Mon.: 10:10 - 11:10 & 14:00 - 15:00 Tues.: 10:10 - 11:10 & 12:40 - 13:40

Course Topics

Week	Topic
1,2	Introduction to biofuels
3,4	Biofuels feedstocks
5, 6	Ethanol
7,8	Biodiesel
10,11	Biogas and biohydrogen
12, 13	Thermochemical conversion technologies
14, 15	Environmental impacts of biofuels
16	Review, and final exam

Course Learning Outcomes and Relation to ABET Student Outcomes: Upon successful completion of this course, a student should:

1.	Understand biomass energy	[K4,S2]
2.	Deals with Bioenergy systems	[S2, C4]
3.	Use organic materials (Plants etc..)	[K4, S2]
4.	Be able to transfer solid material to gas	[S2, C4]
5.	Illustrates how Burning and digestion of wet wastes	[K4, C3]
6.	Biomass as a source of renewable energy.	[K4 , C4]

Assessment Instruments:

Evaluation of students' performance (final grade) will be based on the following categories:

- Exams:** Two written exams will be given. Each will cover about 3-weeks of lectures
- Quizzes:** 10-minute quizzes will be given to the students during the semester. These quizzes will cover material discussed during the previous lecture(s).
- Homework:** Problem sets will be given to students. Homework should be solved individually and submitted before the due date.
Copying homework is forbidden, any student caught copying the homework or any part of the homework will receive zero mark for that homework
- Participation:** Questions will be asked during lectures and the student will be assessed based on his/her response
- Final Exam:** The final exam will cover all the class material.

Grading policy:

First Exam	20%
Second Exam	20%
Homeworks	5%
Quizzes	15%
Final Exam	40%
Total:	100%

Attendance policy:

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

October, 2024