INTRODUCTION TO BIOFUELS

AOM 4521 Section GNVL

(100% asynchronous online)

1. **Catalog Description:** This course gives a broad overview of the key topics in this field of study, approaching them from a technical and economic angle giving the student a comprehensive insight into biofuels and biomass as a whole. Dealing specifically with liquid and gaseous biofuels and bioenergy that can be produced from renewable resources, this course also gives a summary of the past, present, and future production technologies and applications of biofuels and bioenergy. 3 credits (Summer A)

2. **Pre-requisites and Co-requisites:** Biology, Physics and Chemistry related coursework

3. **Course Objectives:** The objective of this course is to provide students with the basic principles of biofuels and bioenergy systems design. Students in this course will identify biofuels and bioenergy sources; describe biofuels and bioenergy technologies, applications and efficiency; analyze biofuels and bioenergy manufacturing, distribution and integration issues; evaluate biogas and its sources and site location; design a biofuels and bioenergy process and its related components.

   Students completing this course will be able to:
   - Demonstrate knowledge of biofuels and bioenergy best practices
   - Have a critical view on problems related to biofuel efficiency
   - Evaluate biofuel and bioenergy equipment

   Specifically students will be able to:
   - Recognize the various types of biofuels and bioenergy systems and components in use
   - Assist in the planning and installation of biofuels and bioenergy systems and components
   - Understand the market and economics of biofuels and bioenergy systems
   - Understand the types of process technologies and standards that apply to biofuel and bioenergy

4. **Instructor:** Dr. Pratap Pullammanappallil
   a. Office location: 203 Rogers Hall
   b. Telephone: 352-294-6719
   c. E-mail address: pcpratap@ufl.edu
   d. Web site: elearning.ufl.edu
   e. Office hours: On zoom. Mondays and Thursdays from 2:00 PM until 3:00 PM. If unable to attend please contact instructor to schedule a meeting.

5. **Teaching Assistant:** None

6. **Meeting Times:** Online class. Lecture videos posted on elearning site.

7. **Class/Laboratory Schedule:** Lectures

8. **Meeting location:** 100% asynchronous online.

9. **Material and Supply Fees:** None

10. **Textbook**
    Required (e-book available in library):
    a. Title: Biorenewable Resources – Engineering New Products from Agriculture
    b. Author: Robert C. Brown and Tristan R. Brown
    c. Edition: 2 e
    c. Publisher: John Wiley, 2014
    d. ISBN: 978-1-118-52495-4

11. Other Reading Materials:

a. Title: Biofuels
Author: Wim Soetaert and Erik Vandamme (Editors),
Publisher: Wiley
ISBN: 978-0-470-02674-8
Year: 2009

b. Title: Biomass for Renewable Energy, Fuels, and Chemicals
Author: Donald Klass
Publisher: Academic Press
ISBN: 978-0-12-410950-6
Year: 1998

c. Peer reviewed scientific articles on biofuel related topics

12. Course Outline:

Week 1
- Course Introduction
- Motivation and Challenges for a Bioeconomy (Group work 1/Homework 1/Exam1)
- Biorenewable Resource Base (Group work 1/Homework 1/Exam1)

Week 2
- Characteristics and Properties of Biomass (Group work 2/Homework 2/Exam1)
- Storage of Biomass (Group work 2/Homework 2/Exam1)

Week 3
- Ethanol (Group work 3/Homework 3/Exam2)
- Renewable Natural Gas (Group work 3/Homework 3/Exam2)

Week 4
- Algae Based Biofuels (Group work 4/Homework 4/Exam2)
- Biodiesel (Group work 4/Homework 4/Exam2)

Week 5
- Thermal Processing of Biomass (Group work 5/Homework 5/Exam3)
- Biopower (Group work 5/Homework 5/Exam3)

Week 6
- Economic Analysis- Estimating Cost of Processing and Processing Facilities (Homework 6/Exam3)
- Environmental Impacts (Exam 3)
- Biorenewable Policies (Exam 3)

13. Important Dates:

May 22, 2026, Friday	Exam 1 (2 hours, Honorlock, open from 6:00 PM until 10:00 PM)
Jun 5, 2026, Friday	Exam 2 (2 hours, Honorlock, open from 6:00 PM until 10:00 PM)
Jun 18, 2026, Thursday	Exam 3 (2 hours, Honorlock, open from 6:00 PM until 10:00 PM)

14. Evaluation of Grades:

Assignment	Total Points	Percentage of Final Grade
Group work (5)	25 each	15%
Homework Sets (6)	25 each	25%
Exam 1	100	20%
Exam 2	100	20%
Exam 3	100	20%
		100%

15. Grading Policy (Tentative):

A (94-100%), A^- (90-94%), B^+ (85-90%), B (80-85%), B^- (75 -80%), C^+ (70 – 75%), C (65-70%), C^- (60-65%) D^+ (55 – 60%) D (50-55%), D^- (45-50%), E (< 45%)

16. Academic Policies & Resources

Academic policies and campus resources can be found at https://go.ufl.edu/syllabuspolicies.