BIO-BASED PRODUCTS FROM RENEWABLE RESOURCES

ABE 4655C/ABE6654C

Class Periods: MWF, period 2 &3, 8:30-10:25am

Location: Frazier Rogers Hall Room 211

Academic Term: Fall 2019

Instructor:
Dr. Zhaohui (Julene) Tong
Email address: ztong@ufl.edu
Telephone: 352-294-6702
Office Hours: Tuesday 1:00 until 2:00 pm, after class or by appointment.

Course Description
Credits: 3

This course is to provide the knowledge for the production of fuels, chemicals and materials from renewable resources. The course includes the fundamental principles and practical applications of bio-based products: biorefinery and biobased products overview, fundamental concepts in understanding biorefinery and biobased products; materials, chemical platforms, and fuels from biomass. Departmental or engineering elective credit (offered Fall) (chemical engineering minor)

Course Pre-Requisites / Co-Requisites

It is recommended that the students have a basic background in general chemistry. The topics of this interdisciplinary course take into consideration that students will be coming to the class from varied backgrounds. Proper background materials will be provided when needed.

Course Objectives

After taking this course, students will be able to:

- Understand an overview of status quo and future direction of the engineering bioproducts from renewable resources.
- Gain knowledge on the fundamental principles for biomass conversion processes.
- Understand practical applications from renewable biomass to energy, fuel, materials, and chemicals.
- Develop teamwork and presentation skills to solve practical problems related to biomass conversion processes

Materials and Supply Fees: none

Professional Component (ABET):

- This course contributes 3 credit hours toward meeting the minimum 48 credit hours of Engineering Topics in the basic-level curriculum for the Bachelor of Engineering Degree in both Agricultural and Biological Engineering and Chemical Engineering (minor)

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	High
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	Low

3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	High
4. An ability to communicate effectively with a range of audiences	Medium
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	
6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	Medium

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

- Biomass as a Sustainable Energy Source from the Future: Fundamentals of Conversion Processes
- Editor(s): Wiebren de Jong & J. Ruud van Ommen
- Publication date: 2014
- Edition: First edition
- ISBN: 978-1-118-30491-4
- Publisher(s): John Wiley & Sons, Inc.,

Recommended Materials

- Principles of Polymer Systems
- Editors(s): Ferdinand Rodriguez, Claude Cohen, Christopher K. Ober, and Lynder A. Archer
- Publication date: 1996
- Edition: fifth editions
- ISBN: 1-56032-939-4
- Publisher(s): Taylor & Francis Books. Inc.

Course Schedule

Unit 1: Biorefinery and biobased products overview
Unit 2: Biomass properties, characterization, and composite
Unit 3: Basic principles of biomass conversion processing
Unit 4: Biomaterials basic
Midterm Exam
Unit 5: Materials from renewable resources
Unit 6: Energy and fuels from renewable resources
Unit 7: Chemicals from renewable resources
Unit 8: Project presentations
Final Exam

Attendance Policy, Class Expectations, and Make-Up Policy

- Attendance is required (some material is only provided in class). It is vital to class participation and in-class discussion. Any tardiness or early departure from class without notification of instructor of 10 minutes will be figured as a half absence. Five absences will result in losing the grading for *Attendance* of 5%. Greater than five absences will result in the next lower letter grade. Excused absences are consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation.
- Making an appointment (or using the office hours) for out-of-class assistance with instructor prior to the day that an assignment is due is expected.
- Using notes, reports, or exam materials from previous offering of this course is considered cheating.
- no late exams are accepted except in university excused absences. Late assignments (for projects and homework) start with 5% deduction after the due date/time (usually on Monday) and then this 10% deduction continues until 8:35 for the next class meeting (usually a Wednesday). Then 20% deduction continues until 8:35am on the next class date (usually a Friday), then 30% deduction until 8:35am on the next class date (usually a Monday). No late homework beyond the third missed class (usually one week from the due day) will be accepted unless arranged with Dr. Tong.

Evaluation of Grades

Assignment	**Total Points**	**Percentage of Final Grade**
Homework of 4 sets	100	20%
Term Presentation	100	15%
Lab Report	100	10%
Midterm Exam	100	20%
Final Exam	100	30%
Attendance	100	5%
		100%

Grading Policy

Percent	**Grade**	**Grade Points**
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing

staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall*,* 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.