



Class Schedule

TR 11:45 am – 1:00 pm in Engineering Complex II/Hernandez Hall Room 109

Instructor

Dr. Catherine Brewer

Office: Reagents Row A114

Email: cbrewer@nmsu.edu

Office Hours: MW 12:30 – 1:30 pm

TR 11:00-11:30 am, F 12:00-1:00 pm

Office Phone: (575) 646-8637

Catalog Description

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials to fulfill food, feed, fiber, fuel and chemical feedstock needs with energy, water, cost, sustainability, and waste management considerations. 3 credits. Students enrolled in 585 will be required to complete an additional assignment. Cross-listed with AGRON, ES, and SOIL, and HORT 486.

Pre-requisites

CHEM 211 or 313 and at least one course in plant science, soil science, food science, or biology, or permission of instructor.

Textbooks

- Required: Sheaffer, Craig C., Moncada, Kristine M., *Introduction to Agronomy: Food, Crops and Environment*, 2nd edition, Cengage Learning, 2014. ISBN: 1111312338.
- Optional: Brown, Robert C. and Brown, Tristan R., *Biorenewable Resources: Engineering New Products from Agriculture*, 2nd edition, Wiley-Blackwell, 2014. ISBN: 1118524950 (CHME 486 Biofuels students will already have this).

Course Objectives

Upon completion of the course, students should be able to:

- Describe what kinds of biomass are used by people to meet their food, feed, fiber, fuel, and other needs.
- Describe how different kinds of biomass are grown, harvested, and processed.
- Evaluate the advantages and disadvantages of biomass applications in terms of cost, energy and water use, environmental impact, and carbon footprint.
- Propose portfolios of crops to grow at a given location based on land availability, climate, resources, market demand, nutrient and water management, etc.
- Compare relative property values of biomass-based products for applications.
- Describe how properties of biomass and biomass-based products are measured.

Professionalism

As a professional-in-training, I have high expectations for your behavior including coming to class prepared and on time, completing assignments on time, asking questions when you do not understand, informing me ahead of time if you will miss an exam and taking

responsibility for making it up, and communicating with respect, proper grammar, and attention to detail. You are expected to make the most of opportunities to collaborate with your colleagues in class and on assignments, but ultimately to do your own work and to acknowledge when you use material someone else prepared (i.e. avoid plagiarism). You can expect the same professional courtesy from me: being prepared and on time for class and office hours, informing you about changes in the schedule, giving feedback on assignments and exams in a timely manner (within 1 week), answering questions to the best of my ability, acknowledging when I make mistakes, being reasonable regarding absences and make-up exams/assignments, and giving my best effort to help you be successful in this course.

Team-Based Learning

This course uses the team-based learning method and may be different from learning styles you have experienced before. Most of the “content” is introduced outside of class as readings and pre-application exercise problems (PreApps), and most of the application activities, conventionally done as homework and outside-of-class group projects, are done in teams during class. Teams will be determined the first day of class and will remain together the whole semester. To ensure that all students complete the readings and are prepared to do the in-class application exercises, daily quizzes (DQs) are taken by individuals and then by teams at the start of each class. The extent to which individual work and team work determine student grades is decided by the class. (For more information about the team-based learning strategy, please see www.teambasedlearning.org)

Assigned Readings and Reading Guides

Except for exam days, you should expect an assigned reading for every class meeting. I will strive to keep assignments reasonable and will provide a written reading guide for each reading. Reading guides and reading assignments from outside of the textbook will be available through Canvas. I put a lot of thought into selecting each reading and preparing each reading guide; I, and your teammates, will expect you to do the readings before class.

Pre-Application Exercise Problems (PreApps)

There will be one pre-application exercise problem (PreApp) at the end of every reading guide that you will be expected to complete and submit as a pdf through Canvas before each class. PreApps will be graded. Late PreApps will only be accepted up until the start of the next class for half credit. Your PreApp problem solutions should be presented with a professional appearance: write clearly and legibly, number your pages, explain your reasoning, acknowledge where your information came from, and show all of your work.

Daily Quizzes (DQs)

As the beginning of every class, individuals and teams will take a 2-question quiz on assigned reading. The team quizzes are taken using an instantaneous feedback assessment test (IF-AT) method. We will practice taking a DQ on the second day of class. DQs are closed book and closed notes.

To account for unforeseen circumstances/unusually heavy workloads, I will drop your lowest two PreApp and individual DQ grades for the semester.

Exams

There will be one in-class mid-term exam and a two-hour final exam during finals week. Exams will be mostly short-answer questions on concepts and relative magnitudes. The final exam will mostly cover material since the mid-term exam but may include a comprehensive question. *Exams are open note and closed book.* Prior approval from me ahead of time, or a certified medical/family excuse, is needed to make up a missed exam.

Field Trip to Santa Fe Community College

On Saturday, October 17 (contingency date: November 7), the class will make a one-day trip to Santa Fe Community College to see the waste management, renewable energy, and biomass operations through SFCC's Biofuels Center of Excellence. We will leave NMSU at 7:30 am, be at SFCC from 1:00-4:00 pm, then return to NMSU at approximately 9:30 pm. I will arrange van transportation and will announce the exact rendezvous location. Within one week of the trip, each student will submit a 2-3 page comparison of the processes used at SFCC to conventional operations; comparisons will include advantages and disadvantages of the alternative systems, as well as some suggestions for improvements SFCC might make.

Students who are not able to attend the field trip may make arrangements to visit a similar facility on their own and submit a similar 2-3 page comparison within one week of their visit. Students must get prior approval from the instructor to complete this alternative assignment.

Communicating about Absences

If you need to miss a class due to an illness, professional travel such as a conference or interview, or a family emergency, let me know (email is fine) and your team members know as soon as possible so that any necessary arrangements can be made. You are responsible for getting any missed materials. Team DQs cannot be made up; individual DQs can be rescheduled with prior approval. All team members will get credit for the team DQs and in-class application exercises, present or not.

Grading

Scores in two major performance areas will be used to determine grades: individual performance and team performance. The percentage of the final grade for each performance area will be determined by representatives during the second class period. The procedure for setting grade weights will be as follows:

1. Student teams decide on weights and select a member to represent the team.
2. Team representatives meet in the front of the room and develop a consensus about the grade weights for the class as a whole.

Note: Team performance points will only count toward your course grade if you achieve at least a 70% in the individual performance category.

Grade Weights

Category	Within Area	Overall
Individual Performance (30-70%)		40 %
Individual DQs (10-40%)	10 %	
PreApps (10-40%)	20 %	
Field Trip Comparison (10-20%)	20 %	
Midterm Exam (20-50%)	25 %	
Final Exam (20-50%)	25 %	
Team Performance (30-70%) x Team Contribution		60 %
Team DQ Scores (20-40%)	30 %	
Application Exercises (40-70%)	40 %	
Peer Reviews (10-30%)	30 %	

The team contribution multiplier will be determined by peer evaluation. Individuals will evaluate the contributions their team members before the final exam by assigning an average of 10 points to the other team members. For example, members of a 5-person team:

- Split 40 points between the other 4 members.
- Must give at least one score >10 and at least one score <10.

Team contribution scores will be the average of the grades (out of 10) received. A “practice” team contribution evaluation will be done at mid-term so that students can receive feedback.

Final grades will be determined as follows: 0-59.9% = F, 60-69.9% = D, 70-71.9% = C-, 72-77.9% = C, 78-79.9% = C+, 80-81.9% = B-, 82-87.9% = B, 88-89.9% = B+, 90-91.9% = A-, 92-97.9% = A, 98-100% = A+. I will give all students a midterm grade estimation before October 19th (the last day to withdraw).

Syllabus Preparation Date

- 8/20/15

The NMSU Department of Chemical & Materials Engineering maintains a syllabus addendum containing course requirements common to all courses with the CHME prefix online. This document is accessible from the URL: <http://chme.nmsu.edu/academics/syllabi/chme-common-syllabus-addendum/>