

## SYLLABUS

**Description.** Bioenergy technologies will be surveyed, including feedstocks, bioelectricity production, biofuel production, and conversion technologies. Fermentation-derived biofuels will then be considered in more detail, including first and second generation biofuels as well as the fundamentals of microbial cellulose utilization. Consolidated bioprocessing will be examined with respect to feedstock solubilization, metabolic engineering, technoeconomic analysis, and research frontiers. Sustainability tools will be introduced and assessments discussed. The course will feature readings from the literature, guest lectures by field leaders, and student projects.

### Learning objectives.

- Skill development pertaining to writing an active, academic review and/or process and sustainability analysis, depending on the interests and choices of individual students.
- Increased exposure and understanding of technological and scientific aspects of biofuel and bioenergy technologies as well the status, potential, and challenges inherent in deploying these technologies.

**Instructor.** *Professor Lee Lynd.* I can be reached by email and am also happy to schedule zoom calls as needed. I suggest that we arrange communication on an ad hoc basis to start with, and institute regular office hours if necessary.

**Class meeting times.** Classes will meet during the Dartmouth fall term (Sept. 11 to November 21). The class meeting time listed in the FEQ catalogue will be 9:00 AM Tuesdays (Br time). The actual meeting time will be: Tuesday and Thursday, 10:10 to 12:00 (US time), 11:10 to 13:00 (Br time) with some class meeting also at 14:10 to 15:05 (US time), 5:10 to 16:05 (Br time).

**Remote access.** When I am at Unicamp, Dartmouth students will access the course remotely. When I am at Dartmouth Brazilian students will access the course remotely. Remote access will be via Zoom (<https://dartmouth.zoom.us/j/7280339785>).

**Communication.** Documents, recorded lectures, and other information pertaining to the course will be accessed via Canvas, details forthcoming.

**Enrollment limitation.** To maximize the quality of interaction between the professor and student, enrollment is limited to  $\leq 6$  Dartmouth students and  $\leq 6$  Unicamp students.

**Format.** All communications will be in English. We will focus on developing two skills: a) writing an active academic review, and b) process and/or sustainability analysis (potentially including economic, environmental, and/or social). Students will present projects using these skills in weeks 6 and 10. In other weeks, class time will be used to hear presentations and have discussions with distinguished experts (below). Professor Lynd will advise students on projects in between classes. Students are encouraged to arrange discussion and review with classmates.

**Assignments.** Students will complete two project assignments. In addition, students will actively participate in, derive value from, and contribute value to class discussions with expert speakers.

*Project 1.*

Format: Either an academic review or a process and/or sustainability analysis.

Proposal due date: Thursday, September 21.

Written submission date: Tuesday, October 10.

Oral presentation to the class: Week of October 16.

*Project 2.*

Format: Either an academic review or a process and/or sustainability analysis.

Proposal due date: Tuesday, October 24.

Written submission date: Thursday, November 9.

Oral presentation to the class: Week of November 13.

Project 2 may be a continuation of Project 1, or it can be a new project.

**Grading.**

Project 1, written presentation: 20%

Project 1, oral presentation: 10%

Project 2, written presentation: 30%

Project 2, oral presentation: 20%

Contribution to class discussions\*: 20%

\* Students are expected to attend as many class meetings as possible. In cases of a hard conflict due to another class or professional obligation, students may view recorded lectures without negatively impacting their discussion contribution grade.

Projects and class discussion contributions will be assessed using letter grades on the following scale:

A: Excellent mastery

B: Good mastery

C: Acceptable mastery

D: Deficient mastery

E: Seriously deficient mastery

Aspects assessed will include presentation quality and the degree to which the review or analysis develops new and significant insights.

Final grades will be assigned according to the following scale:

High Pass: Distinctly superior work (equivalent to A, A-)

Pass: Good work (equivalent to B+, B, B-)

Low Pass: Work deficient but acceptable for graduate credit (equivalent to C+, C, C-)

No Credit: unsatisfactory work, not acceptable for graduate credit (equivalent to D, E)

I feel no obligation to have the distribution of grades conform to some preconceived target.

**Speakers and course schedules.** To be announced.

## ***Disabilities***

“Students requesting disability-related accommodations and services for this course are encouraged to schedule a phone/video meeting with me as early in the term as possible. This conversation will help to establish what supports are built into my online course. In order for accommodations to be authorized, students are required to consult with Student Accessibility Services (SAS; [student.accessibility.services@dartmouth.edu](mailto:student.accessibility.services@dartmouth.edu); SAS website; 603-646-9900) and to email me their SAS accommodation form. We will then work together with SAS if accommodations need to be modified based on the online learning environment. If students have questions about whether they are eligible for accommodations, they should contact the SAS office. All inquiries and discussions will remain confidential.”

## ***Diversity and Inclusion***

Dartmouth aims to have and support:

- a diverse student body - e.g. with respect to race, ethnicity, nationality, class, prior preparation, and gender identity;
- an inclusive environment where all members of our community and those with whom we interact feel respected and valued.

I do too!

I appreciate efforts from class members to embody and foster these values and aspirations. If you experience or see these being compromised, please let me know and I will do what I can to rectify the situation or bring the matter to the attention of an appropriate person who can do so.