**ChBE/ME/MSE 4720**

**Foundational Technologies in the Manufacture of Forest Bioproducts**

**(Formerly Pulp & Paper Manufacturing)**

**ChBE/ME/MSE 6741**

**Pulp & Paper Manufacturing I**


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| Professor: | Dr. Chris Luettgen |
| Office: | RBI Paper Tricentennial Building<br>Room 517 |
| Office Hours: | Mondays, 2:00-3:00 PM with advance notice, or by appointment |
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## Course Objective:

To present in practical and technical terms the nomenclature, processes and technologies used in the forest products industry to manufacture lignocellulosic materials for value-added purposes. This course covers the extent of the industry from forestry best practices through pulping, bleaching, recycling, the chemical recovery process and papermaking technologies.

## Grading Expectations:

| **ChBE/ME 4720:** | **ChBE/ME 6741:** |
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| 25% Mid-term Examination (1) | 25% Mid-term Examination (1) |
| 30% Final Examination (1) | 30% Final Examination (1) |
| 25% Monthly Quizzes (5) | 25% Monthly Quizzes (5) |
| 5% Oral capabilities presented in class | 10% Oral capabilities presented in class (5%) including Term Paper Presentation (5%) |
| 15% Homework (4) | 10% Term Paper |

**Late assignments:** 5 points will be deducted per day late

Final Grading Determinations in this class will be based on traditional cutoffs and historical reference to prior offerings of this material. In the last 5 years, a final comprehensive grade of 85 and above equated

to an A grade; 75-85 equated to a B; 65-75 equated to a C; below a 65 equated to a D. These cutoffs are not cast in stone and may be adjusted based upon this year's assignment/assessment difficulty factors.

As our syllabus states, 5% of your grade will be based upon "oral capabilities presented in class". We wish to point out that this "participation" is not just attendance. This 5% or a point value of 0 to 5, will be based upon participation in several forms: asking and answering questions in class; or in office hours, whether that be online or in person. One should accumulate participation in other ways than in residence in the classroom. Albeit if one chooses to not participate in any of these ways, but still take the class, they would forfeit points towards this 5% participation, which may or may not mean a letter grade. That is up to the individual student. This is intended to be a nudge to be additive to the course and to your classmates by your participation; it is not intended to be a debilitating grade penalty. If someone determines that their priorities must lie elsewhere during a busy semester, this, again, is an individual choice.

If you have further questions, please let me know.

## Class meeting time:

**5:00-6:15 PM (Eastern US) M&W in RBI Seminar Room #114**

## Reference Materials:

There are no required books for this course; only recommended readings which will be reproduced by permission from TAPPI Press in Canvas.

Series of Books, "Papermaking Science and Technology" in the library. Particularly for this course, Volumes 2, 3, 5, 6-1, 6-2, 7 and 20.

Also, "Handbook for Pulp and Paper Technologists", by Smook, Gary A., 3rd Edition, 2015 or 4th Edition, 2017.

There are various other P&P Technology references available, online and in printed form. Students are encouraged to read material that they may come across and bring it to class for discussion.

Visiting Guest Lecturers are invited to our course to augment the material with real life case studies and experiences of working in industry and are subject matter experts that should be utilized to the fullest benefit of the students.

## Learning Outcomes:

By the end of this course a student should:

1. Be knowledgeable of the technologies deployed in the Forest Bioproducts Industry.
2. Be well versed in the processes, equipment and unit operations for pulping, chemical recovery, bleaching, recycled fiber / deinking, paper, board and tissue manufacturing, and converting.
3. Acquire an understanding of Wood Chemistry and Tree and Fiber Morphology in order to comprehend the impact of factors on paper product properties and end use performance.
4. Obtain a fundamental knowledge of Surface Chemistry as it applies to wet-forming processes and the supply-side of chemical applications prevalent in the forest products industry.
5. Understand the environmental issues and safety considerations involved in the operation of a forest bioproducts facility.
6. Be well versed in case studies of mill operation and the economics of the Forest Bioproducts Industry.

## Learning Accommodations:

We will make accommodations for students with documented disabilities. These accommodations must be arranged in advance and in accordance with the Office of Disability Services, (http://disabilityservices.gatech.edu).

Your experience in this class is important to me. If you have already established accommodations with the ODS, please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course.

If you have not yet established services through Disability Services, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), please contact the ODS at 404.894.2563 or dsinfo@gatech.edu or disabilityservices.gatech.edu.

Disability Services offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Disability Services. It is important to the Georgia Institute of Technology to create inclusive and accessible learning environments consistent with federal and state law.

## Academic Integrity:

Students are encouraged to study together and collaborate on case studies, but each student must submit their own work unless the assignment is specifically structured as a group assignment/project.

Cheating, plagiarism, and all forms of academic dishonesty are expressly forbidden in this class, and by the university's Honor Code (http://honor.gatech.edu/content/2/thehonor-code). Any form of cheating will immediately earn you a failing grade for the entire course, and I will pursue further disciplinary actions according to Georgia Tech's policies and procedures (see http://honor.gatech.edu/plugins/faq/ for more information on this).

Here are the things you need to know to ensure that you are working within the constraints of both the university's policy, and my expectations for this course:

1. **Homework Assignments:**

You are welcome to work with other students in this class on your homework assignments, but you must (a) list the names of anyone you work with on your assignment, and (b) write up your own solutions to homework problems, based on your own understanding of the material. Some students find it helps to take a half hour break between any work you do with other students, and the time you spend actually writing up your own solutions.

2. **Campus Resources:**
   You are permitted (and even encouraged) to make use of the academic support services offered by The Center for Academic Success (http://www.success.gatech.edu/) and the Communication Center (http://www.communicationcenter.gatech.edu/).

## Diversity and Disability:

Georgia Tech values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify the instructor as soon as possible. Students with disabilities should contact the Office of Disability Services to discuss options of removing barriers in this course, including accommodations. ODS can be reached at 404.894.2563, dsinfo@gatech.edu, or disabilityservices.gatech.edu