ChBE4200/4210
Unit Operations/Bioprocesses Laboratory
Summer 2012

LECTURES: Tues. & Thurs. 12:00-1:10 pm, room G021 of the MSE building; additional lectures on technical writing and labs will be held during the lab period during the first and third weeks of class. These additional lectures will be held from 1:15-5:00 p.m. in **G021**. You need only attend these additional lectures on your lab day.
LAB: Tues or Thurs. 1:15-6:00 pm, EST Building Room L2160 (lower level 2). Lab will begin during the 4th week of class (see schedule for specifics).

COURSE PURPOSE/OBJECTIVE:
The purpose of this course is to acquaint students with laboratory practices and procedures in the field of chemical and biomolecular engineering. Students will learn how to analyze and interpret experimental data and will be taught to clearly communicate their results and analyses in written and spoken form. The official learning objectives for this course are available on the school's web page at http://www.chbe.gatech.edu/ugrads/courses/4200.pdf .

INSTRUCTORS:
Prof. Pete Ludovice, 894-1835, pete.ludovice@chbe.gatech.edu, ES&T L1234
Office hours Mondays 2-4 p.m. or by appointment
Jacqueline Mohalley Snedeker, 894-8471, jacqueline.snedeker@chbe.gatech.edu, ES&T L1124
See Wiki on T-square to sign up for a writing conference, or contact via email
Todd Clarkson (Lab Coordinator), 404-385-6896, todd.clarkson@chbe.gatech.edu, ES&T L1154

LABORATORY T.A.s:
The TAs will be listed on the T-square course website shortly.

COURSE ASSESSMENT: (bold indicates group project with a shared grade)

Course Element	Fraction	Note
1st week Writing Homework	1%	Write a sample Introduction for a lab report
Lab Style Guide Quiz	4%	Quiz on report writing concepts
Statistics Quiz	8%	1 hour quiz to make sure everyone knows statistics
5 Prelab evaluations	**10%**	Grade is shared equally (except for those absent)
6 Lab reports	**51%**	Each lab report will count 8.5%
2 Lab Orals (Team Leader)	12%	Oral Presentations (10%); Leadership Summary (2%)
Lab practicum	14%	Final test on data analyses, practical modeling, communication skills, and lab experiments
TOTAL	**100%**	

CLASS WEB PAGE: https://t-square.gatech.edu/portal - login to the class **CHBE-4200-A,CHBE-4210-A** (note that both courses are combined into one t-square site) See the class web page for all other administrative information on this course, including TA office hours and contact info.

REQUIRED MATERIALS: A bound lab notebook with carbon copy pages in it, a pair of safety glasses with side shields, and a 100% cotton lab coat (the 100% cotton lab coat is now required by Georgia Tech).

LABS & LAB ORALS

All of the labs will be carried out in groups of 3 (or 2) students. **We will assign these groups during the first week of class, so please inform the instructor if you are considering dropping the class. Note that after the first week of class you cannot drop ChBE lab classes.** The first lab is an introductory one. This task is specifically designed to illustrate the applications of statistical design of experiments and provide an initial experience in writing lab reports. All of the labs will be carried out in the Unit Operations lab on lower level 2 (L2160) of the ES&T building.

Prelabs

Before beginning each of the five "regular" labs, you will need to schedule a preliminary meeting with the TA for that lab. This pre-lab meeting must be held no later than the day before the lab is to be performed. In this meeting, the TA will ask questions to assess how well prepared you are for the lab. Your performance in the pre-lab meeting will be graded by the designated TA for the specific experiment. All members of the group must participate in the pre-lab meeting. No credit will be given to a member of the group if he/she is absent for the pre-lab meeting. Prelabs should take about 20-30 minutes.

*****Please email the TA at least one week ahead of time to schedule the prelab**.***

There will be no prelab requirement for the gummi bear lab (Lab 1)

Lab reports

Each group will submit a total of six lab reports during the semester. A **writing conference** is required for one of your first three lab reports with Ms. Snedeker, the school's technical communications program director. Conferences for subsequent reports are optional. You can sign up for a writing conference on-line on the Wiki on T-square.

The lab reports will be due in paper and electronic form at 11:00 A.M. on the Tuesday or Thursday one week after the experiment was performed. All hard copies of the lab reports should be handed in by the designated deadline in the brown wooden drop box in Room 1201 (main undergraduate office) of the ES&T building. The electronic version should be submitted to T-square.

Lab orals

The **oral presentation** will take place roughly two weeks after the lab report is submitted during the normal Tuesday and Thursday 12:00 class periods each week **in Room L1122**. We may add some additional oral presentation slots as well, TBA. There will be an oral presentation for Lab 1, the gummi bear lab.

The oral presentation should be **10 ± 2 minutes in duration** (not counting questions), and the specifics of the grading criteria can be seen on the grading sheet posted on T-square. You may sign up for a lab oral slot one week in advance on the Wiki on T-square. These presentations will be given in Room L1122 of the ES&T building. Microsoft® Power Point® presentations are to be used. You should bring your presentation on a USB drive or CD to the lab oral, and email it to yourself as a backup. Note that we will record your presentations; these recordings will be available to you on T-square by Friday afternoon of the week that you do your presentation. We strongly recommend that you view this recording so that you can see for yourself the strengths and weaknesses of your presentation style.

TEAMWORK

Leadership summary and team leaders

The role of team leader will rotate among the students and should be assigned prior to beginning each lab. The team leader will organize the team and will give the oral presentation for that lab. The team leader must also submit a **leadership summary**—an on-line description of the manner in which the team interacted. **This assignment should be submitted to T-square no later than 5 p.m. on the date of the team leader's lab oral**. Late submissions will incur a penalty of 10 points per day, up to three days late. They will not be accepted more than three days late. The leadership summary should be neat and succinct but summarize both the positive and negative aspects of this interaction and make suggestions on how the team interaction might be improved. See assignment page on T-square for specific requirements. If the other team members wish to add something of importance to this report, they may also submit a summary.

Work distribution on teams

All the prelab and lab report grades are shared among the group members, so it is assumed that the team members contribute equally. **Significant deviations from this equal contribution should be discussed in the leadership summary or with the instructors directly.** Repercussions for team members who continually fail to contribute equally to the team can include weekly meetings with the instructors, receiving a lower percentage of the grade on a report, or even being dismissed from the team by the instructors.

Because you will all be equally responsible for the group assignments for each lab, effective team leadership and teamwork among the group will not only reduce your workload, but also help produce better lab reports and oral reports**.** Words fail in describing how important it is for you to discuss report details with your team members before you start writing and to begin writing your reports early. There will be little sympathy for students rushing to complete lab reports or oral reports because the team leader waited until the last minute to coordinate with her/his lab partners.

QUIZZES & EXAMS

Quizzes on both statistical methods and report writing will be given in class (see the class schedule). Two 8½" × 11" note sheets (both sides if you need it) are allowed for the statistics exam.

The lab practicum will be given during Dead Week (see class schedule). It will be closed book and will cover all the labs, statistics, and technical writing. Three 8½" × 11" note sheets (both sides if you need it) are allowed for this exam.

COLLABORATION & HONOR CODE ISSUES

Students in this course are expected to abide by the Georgia Tech Honor Code. As per the honor code, no unauthorized collaboration is permitted. While discussions within your lab group are strongly encouraged, **sharing of reports between lab groups is not allowed.** ***Any use of material, text, figures, calculations or analysis from any previous reports will be considered an Honor Code Violation and your case will be referred to the Dean of Students for disciplinary action.*** **Copying any part of these reports or effectively copying (i.e., paraphrasing) the content is an honor code violation.** To verify the originality of your work, you must turn in an electronic copy of all reports that you write. Consult the class T-square site for details on how to turn in the electronic copy of your lab report.

MISCELLANEOUS ISSUES

All lab reports should be bound in a yellow folder and placed in the wooden box in the lobby of the main ChBE office (ES&T 1201). After the scheduled deadline of 11:00 AM, a report is considered one day late.

10 points will be deducted from the final grade for that report for each day for the first two days. No reports will be accepted more than two days late.

Safety glasses with side shields, closed-toe shoes, and a 100% cotton lab coat must be worn in the lab at all times. Each violation of this safety policy will result in a **2% deduction** from the **final course grade**. Safety glasses will be available in the lab, and putting these on should be the first thing you do when stepping into the lab.

You must also purchase and bring (at least one per group) a bound laboratory notebook (with carbon copy pages) to each lab session. After the lab, you must get the original and carbon copy signed by the lab coordinator, or one of the TAs or faculty. The carbon copy should be turned in to the Lab Coordinator after completing the lab**. The original data sheets from your notebook must be included with the report as an appendix.** (You may scan these in or make Xerox copies, if you wish.)

Requests for regrades of any reports should start with the basis for your appeal in writing to the course instructor, with a copy to the TA who graded the report, within one week of receiving the grade. After this one-week period, regrade requests will not be considered. See the T-square website for contact information and office hours for the teaching assistants and other instructors.

Lecture/Lab Schedule ChBE 4200/4210
Summer 2012

Date	Time	Tues.	Thur.
5/15, 17	12:00	Course Introduction	Schedule, Assign Virtual Lab
	1:15	Statistics	Statistics
	2:30	Technical Communication Skills	Technical Communication Skills
5/22, 24	12:00	Assign Groups, Safety, Lab Tour	Technical Communication Skills
	1:15	Lab 1 – Gummi Bear Lab	Lab 1 – Gummi Bear Lab
5/29, 31	11:00	Lab 1 report due	Lab 1 report due
	12:00	**Writing Quiz**	Oral Presentations
	1:15	Lab lectures	Lab lectures
6/5, 7	12:00	Stats Practice	**Statistics Quiz**
	1:15	Lab 2	Lab 2
6/12, 14	11:00	Lab 2 report due	Lab 2 report due
	12:00	Report Feedback	How to do a scientific literature search
	1:15	Lab 3	Lab 3
6/19, 21	11:00	Lab 3 report due	Lab 3 report due
	12:00	Lab 1 (Gummi Bear) oral pres.	Lab 1 (Gummi Bear) oral pres.
	1:15	Lab 4	Lab 4
6/26, 28	11:00	Lab 4 report due	Lab 4 report due
	12:00	Lab 2 oral pres.	Lab 2 oral pres
	1:15	Lab 5	Lab 5
7/3, 5	11:00	Lab 5 report due	Lab 5 report due
	12:00	Lab 3 oral pres.	Lab 3 oral pres.
	1:15	Lab 6	Lab 6
7/10, 12	11:00	Lab 6 report due	Lab 6 report due
	12:00	Lab 4 oral pres.	Lab 4 oral pres.
	1:15	---	---
7/17, 19	12:00	Lab 5 oral pres.	Lab 6 oral pres.
	1:15	Lab 5 oral pres.	
7/24, 26	12:00	Lab Practicum Review	Lab Practicum (12:00-2:00)
	1:15	Lab 6 oral pres.	

Lab Schedule CHBE4200-4210 Summer Semester 2012

Labs 2 through 6

Labs

A. Fractional Distillation
B. Glucose Isomerization
C. Fluidized Bed
D. Liquid-Liquid Extraction
E. CSTR
F. Enzyme Membrane Reactor (4210)
G. Protein Separation (4210)
H. Transdermal Drug Delivery (4210)

Lab Day	Lab Group	2nd lab	3rd lab	4th lab	5th lab	6th lab
Tu	1	A	B	C	D	E
Tu	2	B	C	D	E	A
Tu	3	C	D	E	A	B
Tu	4	D	E	A	B	C
Tu	8 (4210)	H	A	B	F	G
Th	5	A	B	C	D	E
Th	6	B	C	D	E	A
Th	7	C	D	E	A	B