

Spring 2008 SYLLABUS
CHEM 343: TECHNIQUES AND INTRO TO SYNTHESIS &
CHARACTERIZATION (2 credit hours)

Corequisite for 343; 341, 343 prerequisite and 342 corequisite for 344.

Senior Instructor: Dr. Syed R. Hussaini
Room 334, Chemistry Bldg
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Office Hours: MW 11:00 a.m. –12:00 noon

Text: *The Organic Lab Survival Manual*, any edition
Author: James W. Zubrick
Packets from Chem. Stockroom;
LL38

This semester, the Teaching Assistants (TA's) are:

Section 02 Thursday at 01:00 p.m.: Han Yang, (yanghan66@yahoo.com.cn)
Section 04 Monday at 01:00 p.m.: Weibo Wang (luckyafee@gmail.com)
Section 05 Wednesday at 01:00 p.m.: Han Yang, (yanghan66@yahoo.com.cn)
Section 75 Monday at 07:00 p.m.: Weibo Wang (luckyafee@gmail.com)_

The lab will be held in CHEM 216. The TA's will provide you with their office hours and other necessary information in the first lab session. They are responsible for the instruction, supervision and grading of the laboratory. Feel free to contact them in this regard. If you have a complaint about the way your lab reports are graded, please contact me.

<u>Dates</u>	<u>Exercise/Experiment</u>	<u>Pre-lab Reading (for Zubrick 6th edition)</u>
Mon. Jan. 07. Wed. Jan. 9-Thurs. & Jan. 10	Check-in; lab safety; equipment demo: Micro and Macro, course protocol	Zubrick Chap 1,2 & 4-9
Mon. Jan. 14 & Wed. Jan. 16-Thurs. Jan. 17. Wed. Jan. 23-Thurs. Jan. 24 & Mon. Jan. 28	1) Identification and purification of unknown solids 2) Microscale boiling point determination	Zubrick Chap 10-14 and 26
Wed. Jan. 28-Thurs. Jan. 31 & Mon. Feb. 04	Simple and fractional Distillation. Set-up for the synthesis of ethanol. Microscale	Zubrick Chap 17-21 and 36.

Wed. Feb. 06- Thurs. Feb. 07 & Mon. Feb. 11	Distillation of Ethanol. Macroscale	Zubrick Chap 17-21 and 36.
Wed. Feb. 13- Thurs. Feb. 14 & Mon. Feb.18	Extraction of chlorophyll and carotenoids from Spinach (save your crude products). Microscale	Chap 15, 16, 27, 28 and 37.
Wed. Feb. 20- Thurs. Feb. 21 & Mon. Feb. 25	Chromatographic separation of chlorophyll and carotenoids. Microscale	Zubrick Chap 29
Wed. Feb. 27- Thurs. Feb. 28 & Mon. March 03	Acid catalyzed dehydration of a secondary alcohol. Microscale GC analysis of the products. Microscale	Chap 31 and 32
Wed. March 05- Thurs. March 06 & Mon. March 17	Acid catalyzed hydration of norbornene. Microscale	Chap 25 and read Zubrick on separatory funnel extraction
Wed. March 12- Thurs. March 13 & Mon. March 10	Spring break	
Wed. March 19- Thurs. March 20 & Mon. March 24	The stereochemistry of Br ₂ addition to an alkene. Microscale	Zubrick on reflux
Wed. March 26- Thurs. March 27 & Mon. March 31. Wed. April 02- Thurs. April 03 & Mon. April 07	Williamson ether synthesis. Miniscale 1) Synthesis and work-up. 2) Purification and NMR analysis (Early checkout is possible)	Zubrick on reflux, extraction and short-path distillation. Chap 35 on NMR

Wed. April 09- Final checkout
Thurs. April 10 &
Mon. April 14

Safety: It is the number one priority. Lab safety glasses are mandatory. Shorts, tank-tops, sandals, etc. are not allowed. Cell phones, beepers, devices that require headphones, etc. should not be used in the lab. Long hair must be tied back. Gloves are available and sometimes will be made mandatory. Precautions about each experiment are noted at the end of experiment's write up.

Course Objective: The main objective of this course is to provide you hands-on experience with the basic techniques used by organic chemists. Afterwards, you will utilize these techniques in synthesis. Later in the semester, you will also learn important characterization/product analysis techniques.

Notebooks: Reports should be in bound form. Hand written reports should be done in ink (pencil can be used only for calculations). Typewritten lab reports are accepted. Lab reports are due during your scheduled lab time one week after the completion of the experiment. Late submission of reports will result the loss of 10 points per day. Guidelines for maintaining a lab notebook and a sample of a lab report are provided at the back of your packet.

Lab Preparation: Read the appropriate sections of Zubrick before each experiment. The actual experiments are provided in the form of a packet and are available for a minimal fee (usually \$5).

When you come to the lab, turn in all the pre-lab questions. Also, write down the experiment partially with information like title, purpose, overall reaction, and general procedure. Add observations, data, and conclusion during the course of the experiment.

Grading: Single session experiments are worth 100 points, and double session experiments are worth 200 points. You are allowed to drop one lab grade worth 100 points. Grades will be computed based on a possible 1000 points. The final assignment of letter grades will be based approximately on the following schedule:

1000- 900	90%-100%	A
899-800	80%-89%	B
799-700	70%-79%	C
699-600	60%-69%	D
Below 600	below 60%	F

I reserve the right to lower these divisions. Yields are not the primary focus of the course. Your ability to work diligently and think like a good bench chemist will be more important. The quality of your lab report will contribute significantly to the overall grade. Your techniques and lab habits will be observed by myself or the TA, and will also contribute to the final grade. In case you have low yield, a low mp, or impurities in your product, please don't fudge the data. If you can offer a reasonable explanation, it will be considered more important.

Make-up exams will not be given. For unusual circumstances, please come see me.

Incompletes will be assigned only for the reasons mentioned in the Student Handbook. Failure to check-out and replace missing or broken equipment will also result in an incomplete.

Miscellaneous Information: At the initial check-in you will be assigned a locking drawer. Check each item on the check-in list and get the missing or broken items replaced, free of charge, from the stockroom (B-38). After, the initial check-in, you will be responsible for replacing any missing or broken item. The micro-scale equipment will be available on a daily check-out basis. All this equipment must be returned in one piece, clean and ready to use at the end of each lab period. Again, you will be responsible for the immediate replacement of any of the broken or missing item.

I reserve the right to make changes in the syllabus when necessary in order to meet the learning objectives, to compensate for missed classes, or for other similar reasons.