

Course Objectives

Synthesis I Laboratory serves as an introductory organic chemistry laboratory course and is designed such that each student will (1) learn and utilize the basic techniques associated with performing the synthesis, isolation, purification, identification, and characterization of organic compounds, (2) learn and understand the theoretical principles behind the techniques used, (3) learn to analyze data in order to properly identify organic compounds, (4) effectively communicate his/her findings through written laboratory reports, and (5) become increasingly responsible for outlining the procedures performed during the laboratory experiences. (e.g. In experiment one, full experimental procedures are provided, while in experiment eight, detailed reagent amounts and procedures for previously learned techniques are omitted, and the student is responsible for performing calculations to determine the amount of reagent necessary and for performing the techniques based on prior experience.)

Course Components

	<u>Section</u>	<u>Day</u>	<u>Time</u>	<u>Building</u>	<u>Room</u>
Lecture ¹	AB	M	14:40-15:50	Instr. Center	103
Laboratory ²	A1/B1	T	13:05-16:55	Boggs	2-13/2-15
	A2/B2	W	13:05-16:55	Boggs	2-13/2-15
	A3/B3	R	13:05-16:55	Boggs	2-13/2-15
	A5	T	08:05-11:55	Boggs	2-13
	A6	R	08:05-11:55	Boggs	2-15

¹Attendance at the first lecture session is mandatory, no exceptions.

²You must attend the assigned laboratory section.

Course Instructor & Office Hours

Instructor: Dr. Amanda B. Stephens

Office: Boggs 2-90D

Email: amanda.stephens@chemistry.gatech.edu

Office Hours:

Wednesdays 10:00-11:00

Fridays 9:00-10:00

If you are having trouble with data interpretation or writing reports, please see me or a teaching assistant during posted office hours. If you are having trouble with a technique, be sure to get advice during the lab period. If you are unable to come by during office hours due to scheduling conflicts, arrange an appointment for another time via email. TA office hours and contact info can be found on T-Square.

Required Course Materials

- Text: Zubrick, J. W. *The Organic Chem Lab Survival Manual: A Student's Guide to Techniques*, 2012, 9th Ed. ISBN-13: 9781118083390
- Lab Coat: 100% cotton laboratory coat
- Goggles or Safety Glasses with Splash Guards
- Lab Notebook: carbonless copy lab notebook (it makes yellow or blue duplicates)
- BuzzCard Funds: Students must maintain a minimum balance of \$30 on his/her BuzzCard account in case of breakage (see breakage policy).
- Combination Lock

Grading Policies

Grades are calculated on the basis of **1130 pts**, distributed as follows:

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| • nine laboratory reports (50 pts each) | = 450 pts |
| • ten pre-lab exercises (10 pts each) | = 100 pts |
| • ten notebook checks (5 pts each) | = 50 pts |
| • one in-lab worksheet (50 pts) | = 50 pts |
| • ten product/spectral quality evaluations (10 pts each) | = 90 pts ³ |
| • one take-home worksheet (50 pts) | = 50 pts |
| • one lab practicum (120 pts) | = 120 pts |
| • two mid-term lecture quizzes (50 pts each) | = 100 pts |
| • one comprehensive final quiz (100 pts) | = 100 pts |
| • one technique/performance evaluation (20 pts) | = 20 pts |

Grades will be assigned as follows:

- 1017 pts (90%) guarantees an A
- 904 pts (80%) guarantees a B
- 791 pts (70%) guarantees a C
- 678 pts (60%) guarantees a D

Laboratory Reports: Grading will be according to the scoring cover page available for each experiment. The cover page should be printed out by the student and attached to the front of the laboratory report. Laboratory reports are due according to the table below. *Laboratory reports that are not submitted on time will receive a 10 pt (20%) deduction*, and the student will have one additional week to complete and submit the assignment. An additional 10 pts will be deducted for each additional week that the assignment is late. It is possible to submit a late report and still earn no credit for the report. (e.g. If a report is submitted three weeks late but earned only 25 pts after grading, a score of zero will be recorded.) Assignments must be submitted within four weeks of the due date in order to receive credit. Assignments that are not submitted within four weeks will be awarded zero points. No late assignments will be accepted after Friday, November 20, 2015 at 5:00p. There will be no exceptions to this deadline. *Lab Report Guidelines and the Grading Rubric can be found on T-Square.*

Regrade requests should be submitted in writing to Dr. Stephens no later than one week following the return of the graded assignment to the student. (i.e. If the assignment is returned to the student on Tuesday, the regrade request should be submitted by the following Tuesday.) A written case should be made for why the student believes that deducted credit should be returned for an answer or detail and should be attached to the front of the original graded document. The instructor reserves the right to regrade the entire assignment.

Pre-Lab Exercises are worth 10 pts each. The Pre-Lab Exercise worksheet should be printed and completed. Pre-Lab Exercises are due for experiments 1-10 at the beginning of the laboratory period during which each experiment is to be performed.

Notebook Checks are worth 5 pts each and are to be performed for experiments 1-10. Your notebook will be checked at the beginning of the laboratory period to ensure that you have included a written procedure and other pertinent details as outlined in each experimental package. Completed notebook page duplicates should be submitted at the end of each laboratory period and will be graded for completeness and details. See the Notebook Guidelines for further details of what is to be included.

In-Lab Worksheet will be completed during the laboratory period of the last week of labs (Experiment 12). This worksheet will be turned in prior to leaving the laboratory.

Product and Spectral Quality Evaluations will be based on your submission of a product sample and/or spectral data for each experiment as designated in each experimental package. Products will be graded for amount, purity, dryness, and color. Spectra will be graded for quality. Failure to produce product/submit a sample or the required spectra will result in a grade of zero being recorded for that evaluation. ³The lowest product/spectral quality score will be dropped at the end of the term. A score of zero for which a student did not attend lab will not be dropped.

Take-Home Worksheet is worth 50 pts and will be distributed in lab during the week of September 14, 2015. The worksheet is to be completed independently during that week and turned in at the beginning of lab during the week of September 21, 2015. Students are not permitted to work together on this assignment.

Laboratory Practicum will test your skills in the laboratory. The laboratory practicum will be performed in your regularly assigned laboratory period during the week of November 9, 2015. Further details will be distributed later during the term. No make-ups will be permitted.

Lecture Quizzes will be taken during lecture on **Monday, September 14, 2015, Monday, October 19, 2015, and Monday, November 23, 2015**. The first lecture quiz will cover experiments 1-3, the second lecture quiz will cover experiments 4-7, and the final lecture quiz will be comprehensive. These are designed to assess your understanding of the experiments, techniques, and concepts that are taught in

the course. No make-ups will be permitted for these quizzes. Students with ADAPTS testing accommodations must arrange to take their lecture quizzes in the testing center; these quizzes must be taken at the same time that the lecture quiz is given to other students.

Technique and Performance Evaluations will be based on how well you perform in the laboratory. This includes, but is not limited to, promptness, preparedness, how often you break or spill things, independence, how well you follow the laboratory policies and safety instructions (see Laboratory Policies & Safety), and cleanliness. The TAs and Instructor are watching! If you leave a mess at the balances or frequently bring noxious chemicals outside of the hood, your grade will suffer.

Assignment Due Dates

See the course schedule for experiment, lecture quiz, and practicum dates. In general, lab reports will be due at the beginning of lab during the week following experiment completion. (i.e. If your lab is on Tuesday at 8:05a, your report for that experiment will be due the following Tuesday at 8:05a.)

<u>Assignment</u>	<u>Sections A1/B1/A5</u>	<u>Sections A2/B2/A6</u>	<u>Sections A3/B3</u>
Exp 1 Lab Report	Tues, Sept 1, 2015	Wed, Sept 2, 2015	Thurs, Sept 3, 2015
Exp 2 Lab Report	Tues, Sept 8, 2015	Wed, Sept 9, 2015	Thurs, Sept 10, 2015
Exp 3 Lab Report	Tues, Sept 15, 2015	Wed, Sept 16, 2015	Thurs, Sept 17, 2015
Exp 4 Worksheet	Tues, Sept 22, 2015	Wed, Sept 23, 2015	Thurs, Sept 24, 2015
Exp 5 Lab Report ⁴	Tues, Oct 6, 2015	Wed, Oct 7, 2015	Thurs, Oct 8, 2015
Exp 6 Lab Report ⁴	Tues, Oct 20, 2015	Wed, Oct 21, 2015	Thurs, Oct 22, 2015
Exp 7 Lab Report ⁴	Tues, Oct 27, 2015	Wed, Oct 28, 2015	Thurs, Oct 29, 2015
Exp 8 Lab Report	Tues, Oct 27, 2015	Wed, Oct 28, 2015	Thurs, Oct 29, 2015
Exp 9 Lab Report	Tues, Nov 3, 2015	Wed, Nov 4, 2015	Thurs, Nov 5, 2015
Exp 10 Lab Report	Tues, Nov 10, 2015	Wed, Nov 11, 2015	Thurs, Nov 12, 2015
Exp 11 Lab Practicum	Tues, Nov 10, 2015	Wed, Nov 11, 2015	Thurs, Nov 12, 2015
Exp 12 Worksheet	Tues, Nov 17, 2015	Wed, Nov 18, 2015	Thurs, Nov 19, 2015

⁴Experiments 5, 6, and 7 include characterization by NMR spectroscopy. You will receive your NMR results the following week during lab, and the lab reports will be due one week after those results are received. This will result in two lab reports being due during the week of Oct 26, 2015.

⁵The Experiment 12 Worksheet will be completed in lab and handed in before leaving that day.

Attendance Policy

Attendance at all assigned laboratories is mandatory. In case of illness or other excused absence, contact Dr. Stephens via email prior to missing laboratory. It is the responsibility of the student to ensure that proper documentation is submitted to the instructor in a timely manner in order to arrange for a make-up. Make-up sessions must be arranged at least one week prior to a scheduled absence or within three days following an unscheduled absence. The availability of make-up sessions is dependent on course

enrollment and the experiment that needs to be made-up. A laboratory session for which a student arrives unprepared and is refused admittance does not constitute an excused absence.

Laboratory Admittance

Students should arrive at the laboratory having already read the entire experiment package and having completed the Pre-Lab Exercises and written necessary details in the laboratory notebook as outlined in the Notebook Guidelines.

In addition, students must be wearing the proper attire to gain admittance to the lab, as follows:

- Shoes must cover the entire foot. No flip flops, ballet flats, or open-toed shoes are permitted.
- Students must wear pants that cover to the ankle. Synthetic materials and skin-tight pants are not permitted.
- Safety glasses/goggles must be worn at all times during the laboratory period. Students must be wearing safety glasses/goggles when they enter the lab.
- Laboratory coats must be worn at all times while inside the lab and should cover to the knees.
- Long hair should be tied back.

Students arriving more than 15 minutes late for lab, including time for which they are sent away due to inappropriate attire, will not be permitted to enter the lab or make-up the experiment.

Breakage Policy

Each student is required to maintain a minimum \$30.00 balance in their BuzzCard account in order to replace broken/lost equipment. In the event that you need to make a purchase, present your BuzzCard and a completed Laboratory Equipment Replacement form to the Laboratory Coordinator during the laboratory period. The amount will be deducted from your account, and you will be supplied with replacement equipment.

During the first week of labs, you will check in to your assigned desk. Check the equipment list against the contents of your lab desk. Be sure to check for any cracks or broken equipment. If you are unsure what a piece of equipment is, consult your TA. Once you are sure that you have a complete set of equipment, sign the check in sheet and return it to your TA. From this point forward, you are responsible for maintaining the equipment in your desk until you check out.

During the last week of labs, you will check out of your assigned desk in consultation with your TA. Any missing or broken equipment is your responsibility to replace. Glassware must be clean and free of chemical residue before check out is permitted. If you drop the course, you must check out within two weeks of dropping. Failure to check out will result in "incomplete" being reported for the course, and a hold will be placed on your registration.

Honor Code

Students are required to sign and date all graded materials in accordance with the Georgia Institute of Technology Academic Honor Code (www.honor.gatech.edu). By turning in an assignment for a grade, each student represents that he/she is the sole author of the work presented and that no act of plagiarism or academic misconduct has been performed during the preparation of the work. If a student fails to sign and date graded materials, a grade penalty may be applied.

Students are permitted to work together with other students who are currently taking the course (unless otherwise specified) and are encouraged to discuss their reasoning and thought processes in order to foster a positive learning environment, but the generation of answers, phrases, lab reports, numbers, figures, and structures must be the work of each individual student. Students are not permitted to use data, lab reports, or experimental packages, in part or in whole, from prior semesters during the preparation of their reports, as this constitutes academic dishonesty. Submission of a lab report that has elements taken directly from someone else's work constitutes plagiarism and, therefore, academic dishonesty. Cases of academic dishonesty will be handled according to the GTAHC.

Structures and figures may be either hand drawn or constructed using ChemDraw, for which GA Tech has a site license and which is no cost to the student. Copying and pasting a figure from someone else's work, including the internet, without a proper citation is considered plagiarism. Students will receive no credit for obviously copied structures and figures that do not include a proper citation. If you have any questions or concerns about these or any other Academic Honor Code issues, please consult the instructor.

Disabilities

The Georgia Institute of Technology complies with the Americans with Disabilities Act (ADA). Any student who requires accommodations under the ADA must meet with the instructor at least one day prior to the student's first scheduled laboratory session to discuss an accommodation plan with the instructor. The student should arrange for a letter of documentation from the ADAPTS office to be sent to the instructor to support the request for accommodation.

Discrimination and Harassment

In accordance with the documented policies of the Georgia Institute of Technology, discrimination and harassment on the basis of race, color, sex, gender, national origin, religion, disability, sexual orientation, veteran status, or anything else is strictly prohibited.

Notice

The syllabus and course schedule are subject to change. Additional instructions for assignments will be included in each laboratory package, and additional information regarding laboratory policies, the course calendar, notebooks, laboratory reports, desk assignments, equipment, safety, and relevant software can be found on T-Square.