Syllabus for honors/majors organic chemistry laboratory: Chemistry 2924/2214
Spring 2020

Section 001, Monday, 2:00-4:50 PM, BE401--UCA-- Evan Haley
Section 002, Wednesday, 2:00-4:50 PM, BE401--UCA--Janet Lam
Section 003, Thursday, 8:00-10:50 AM, BE401--UCA--Esha Kadakia

REQUIRED TEXTBOOK AND SUPPLEMENTARY MATERIALS:
3. A flash drive or similar USB device.
4. A bound lab notebook for record keeping and some laboratory notes. You could also use the top bound, duplicate pages, notebook published by Hayden-McNeil (ISBN 978-1-930882-00-3) and available for purchase at Temple University Bookstore.
5. Eye Protection glasses/goggles that meet ANSI Z.87.1 1989 requirements are available for purchase at Temple University Bookstore

COURSE DESCRIPTION: This course is a continuation of Chemistry 2213/2923 and is offered in the Spring semester. It places an emphasis on preparation, purification, and analysis, including multi-step sequences, of typical moderately complicated organic compounds. The student will learn experimental techniques in organic chemistry while working with small amounts of materials.

Upon successful completion of this course, you will be able to:
1. Computer based molecular modeling programs and search engines
2. Work safely in an organic lab and record your results
3. Perform basic laboratory techniques such as extraction, recrystallization, reflux, fractional distillation, and gas chromatography
4. Record spectra using the FT-IR and 60MHz NMR spectroscopy
5. Work effectively with small amounts of material.
6. Set up simple reactions, and extract, isolate and analyze the desired products.

Pre-requisite: Organic Chemistry 2213/2923 with a C- or better. Students without this pre-requisite will be de-enrolled from the course.

Co-requisite: Chemistry 2212/2922 - Majors/Honors Organic Chemistry Lecture (minimum grade of C- if already taken).

INSTRUCTOR: Jaskiran Kaur, BE426B, Jaskiran.kaur@temple.edu, 215-204-7161,
UCA: Evan Haley tug99258@temple.edu, Janet Lam tuh12479@temple.edu, Esha Kadakia tug44453@temple.edu
OFFICE HOURS: M,W- 10am to 1pm, T- 10am to noon or by appointment (email to set appointment).
<table>
<thead>
<tr>
<th>Week</th>
<th>Subject/Experiment</th>
<th>Comments, experiment number: page number from the book (top numbers)</th>
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</thead>
<tbody>
<tr>
<td>13th January-17th January</td>
<td>Spartan #4 BE220</td>
<td>Introduction to lab procedures and syllabus  Practicing with Spartan. Exploring Diels-Alder reaction. Check in for wet-lab</td>
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<tr>
<td>21st January-27th January</td>
<td>Diels-Alder reaction</td>
<td>Synthesis of 9,10-Dihydroanthracene-9,10-α,β-succinic acid anhydride. 15: 269</td>
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<tr>
<td>28th January-3rd February</td>
<td>Electrophilic Aromatic Substitution Part 1</td>
<td>Synthesis of 4-Bromoacetanilide. 28: 368</td>
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<tr>
<td>4th February-10th February</td>
<td>Electrophilic Aromatic Substitution Part 2</td>
<td>Recrystallization and spectral analysis of 4-Bromoacetanilide. 28: 85-91, 368</td>
</tr>
<tr>
<td>11th February-17th February</td>
<td>Grignard reaction Part 1</td>
<td>Synthesis of Triphenylmethanol.16:275</td>
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<tr>
<td>18th February-24th February</td>
<td>Grignard reaction Part 2</td>
<td>Purification and TLC analysis of the Grignard reaction part 1 product. 16:275</td>
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<tr>
<td>25th February-28th February 9th March</td>
<td>Ketone reduction</td>
<td>Ketone Reduction: synthesis of cis- and trans-4-tert-Butylcyclohexanol. 5B: 158</td>
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<tr>
<td>10th March-16th March</td>
<td>Esterification</td>
<td>Esterification: Synthesis of n-butyl ester. 8B:201</td>
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<tr>
<td>17th March-23rd March</td>
<td>Nucleophilic Aromatic Substitution</td>
<td>Synthesis of 2,4-Dinitrophenylthiocyanate. 30:384</td>
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<tr>
<td>24th March-30th March</td>
<td>Aldol Reaction</td>
<td>3-Hydroxy-3-(4-nitrophenyl)-1-(2-pyridyl)-1-propanone. F1:7W-38 (lower page number 351)</td>
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<tr>
<td>31st March - 6th April</td>
<td>Peptide synthesis 1</td>
<td>Synthesis of a dipeptide using SPPS</td>
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<tr>
<td>7th April - 13th April</td>
<td>Peptide synthesis 2</td>
<td>Cleavage, isolation and analysis of the dipeptide</td>
</tr>
<tr>
<td>21st April-27th April</td>
<td>Final exam, Check-out and clean up</td>
<td>Submit your lab notebooks (returned at the end of session) Email/share some of your lab reports.</td>
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GRADES AND ASSIGNMENTS: During this course you will be working on the following assignments. Check the hyperlinks for details of each assignment. There will be a total of 1450 possible points. The breakdown is as follows:

- **Pre-lab** - 11 x 30 points = 330 (total points) (22.7%)
- **Pre-lab presentation** - 100 (total points) (7%)
- **Post-lab quiz** - 13 x 30 points = 390 (total points) (27%)
- **Lab reports** - 12 x 40 points = 480 (total points) (33%)
- **Final exam** - 100 (total points) (7%)
- **Lab Notebook** - 25 (total points) (1.7%)
- **Technique** - 25 (total points) (1.7%)

LABORATORY SAFETY: You must read the safety guidelines in the Red safety book and must sign and submit the compliance form at the end by the second week. Students are required to conduct themselves in a professional and safe manner at all times. Failure to do so will result in immediate dismissal from the lab. In order to comply with the Federal laws and regulations, students are required to dress appropriately for lab and wear specified personal equipment. Students who come to lab without safety glasses or dressed improperly will not be permitted to work in the lab.

- Long hair be tied back
- All students must wear approved safety glasses (contact lenses are not to be worn as organic solvents getting between your iris and the lens can damage your eyes). It is your responsibility to bring them to lab as loaners are not available.
- Long pants MUST be worn. Shorts and skirts are not allowed in the lab at any time. Arms should be covered to the elbow and midriffs should not be exposed. A full-length lab coat or apron must be worn for all experiments (provided in the lab).
- Shoes that cover the entire foot should be worn. Sandals, clogs, open top, or open toe shoes are not permitted in the lab. At any time.
- Scarves, veils, etc. will be tied back or removed during the lab

For more specific information, please read carefully the [Lab Safety](#) and [Waste Disposal](#) documents.

COURSE POLICIES

**Academic Integrity:** Integrity is a crucial part of academic experience, and students are expected to adhere to the highest standards of academic honesty. Collaboration and discussion are encouraged, but you are responsible for writing your own lab reports in your own words. You are expected to work independently on exams and quizzes. Cheating of any kind will not be tolerated and will result in a score of zero on the assignment(s) in question, and/or a failing grade in the course. Please carefully read the [Academic Integrity](#) and [Student Code of Conduct](#).

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Attendance: Students are expected to attend all laboratory meetings, to arrive on time, and to be prepared to perform the scheduled experiment. Students are required to attend their registered laboratory section at the scheduled time. If you arrive more than 15 minutes late, may not be admitted. Please inform your instructor any attendance issues as soon as possible.

Make-up policy: No make-up labs and/or make-up lab quizzes will be granted under a very limited and specific set of circumstances. Otherwise, score of zero will be recorded for any missed labs or quizzes. Student athletes and other students with legitimate absences will be accommodated only if the planned absence is brought to the attention of your instructor well in advance (at least one week). Please see the Make-up policy document for additional details.

Canvas: You are responsible for the information posted on the Canvas site. Course documents such as the syllabus, safety guidelines, lab notebook, report guidelines, and supplemental laboratory experiment information will be posted on Blackboard. Any general course assignments will also be posted on Blackboard.

Electronic Devices: The use of graphing and/or programmable calculators, PDAs, and cell phones is strictly prohibited when taking quizzes and exams. Also, you can’t use laptops, ipads, or any other electronic devices during wet labs.

Withdrawal: A withdrawal is an institutional procedure that is not complete until the withdrawal form has been signed and submitted to the Registrar’s office. Details of the Temple University policy on Withdrawal may be found here.

Incomplete: Please note that an Incomplete ("I") Grade is only given in accord with institutional procedures. The "I" grade cannot be given until the specific requirements have been met and forms filled out, signed and submitted. This course is governed by the Temple University Policy (#03.12.13) on Incompletes. Please click here to view the policy.

Note of Student Coursework
Temple University is committed to providing excellent and innovative educational opportunities to its students. To help us maintain quality academic offerings, the University and its programs regularly examine the effectiveness of the curricula, teaching, services, and programs the University provides. As Temple University sees appropriate, it may retain representative examples or copies of student work from all courses. This might include papers, exams, creative works, or portfolios developed and submitted in courses or to satisfy the requirements for degree programs as well as surveys, focus group information, and reflective exercises.