CHE-7-327 Syllabus : Organic Chemistry Laboratory

2018/2019

Instructors:

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| Charley Liberko  RSC 401 | Andrea Pionek  RSC 402 | Jai Shanata  RSC 406 |

Catalog description

CHE 327 – Practical laboratory aspects of organic chemistry. Isolation and purification of substances; and, possibly, synthesis projects. Prerequisite: CHE326.

Required Materials

**Text:** Addison Ault, *Techniques and Experiments for Organic Chemistry*, 6th Edition.

(ISBN 0-935702-76-8) You should have the textbook with you in the lab at all times.

**Goggles** UVex “Stealth model S3960C.

**Carbonless notebooks** (ISBN 9781930882188).

**Calculator:** You should have access to a calculator during pre-lab and for quizzes.

A separate laboratory manual containing detailed directions on assignments will be provided by the department.

# ****Class hours****

Each day we will meet at 9:00 AM in the classroom to review the previous day’s results and to discuss the experiment for the day. It is expected that all equipment be set up and ready to go by 12:30. Experimental work will typically be carried out between 12:30 and 3:00 PM but a few experiments will be started in the morning. Any other time from 8:00 to11:30 and 12:30 to 4:30 will be considered “office hours” and the lab may be used (with supervision) for setting up equipment, cleaning glassware, weighing products, and taking melting points.

Before coming into the lab each day, students must be adequately prepared in order that the lab time is spent safely and efficiently. Proper preparation includes reading the lab procedure and relevant background material, and preparation of the notebook with all necessary physical data (relevant melting points, boiling points, densities, and solubilities).

The carbonless copy from your notebook, lab reports, products, and extra credit questions are due by 4:30 PM on the day listed in the schedule.

# Grading

## Point Breakdown Points Approx. %

Attendance 130 15

Notebook 130 15

Reports/poster 260 30

Products 40 5

Quizzes 80 9

Final Exam 100 11

Technique 100 11

Self reflections 30 3

Total 870 100

As a general guide for grading, the following cut -offs will be used:

90% A- 80% B-

70% C- 60% D-

# Academic honesty

*Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College’s requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Catalogue, under the heading “Academic Honesty."*

Another aspect of academic honesty requires that answers given on quizzes and exams are not copied from or by other students. Students are expected to protect their work from being seen by others and to avoid looking at another’s work. Cell phone use during quizzes and exams is not permitted.

# Equal opportunity

*Cornell College makes reasonable accommodations for persons with disabilities.  Students should notify the Coordinator of Academic Support and Advising and their course instructor of any disability related accommodations within the first three days of the term for which the accommodations are required, due to the fast pace of the block format.  For more information on the documentation required to establish the need for accommodations and the process of* [*requesting the accommodations*](http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml.)*, see*[*http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml*](http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml)*.*

# Educational Priorities and Outcomes (EPOs)

  The homework in this course will address knowledge, inquiry, reasoning, and communication. The lecture will also address vocation, ethical behavior, citizenship, and well-being where appropriate.

# ****A word about well being****

Your brain is a physical part of your body. If you do not take care of your body, your brain will not function to its full potential. If you want to do your best in the class, do not ignore the importance of a healthy diet, reasonable amounts of sleep, and effective methods of dealing with stress. Be sure to regularly take some time to look at the big picture and remember how this course contributes to your life goals.

Students have a right to a safe and reasonably comfortable learning environment. If you encounter any circumstances that interfere with your full participation in class activities please make them known to the course instructor. This can be done in person, by email, or even by an anonymous note. If we can do anything to help make this experience more productive for you please let us know.

**CHE 327 Schedule**

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| --- | --- | --- | --- | --- |
| **Day** | **Experiment** | **Reference**  (pages) | **Techniques / Reactions** | **Work due** |
| M 3 / 18 | 1. Isolation of acetylsalicylic acid from aspirin tablets | 43-54, 150-159, 332-333 | heating, filtration, crystallization, melting points |  |
| Tu 3 / 19 | 2. Distillation of  ethanol / water mixture | 62-72, 75-80, 305  207-231 | Distillation, NMR | Exp.1 flowchart (10 points) |
| W 3 / 20 | 3. Preparation of 2,4-dinitrodiphenylamine | 475-476  116-119 | Nucleophilic aromatic substitution, recrystallization, TLC |  |
| Th 3 / 21 | 4. Preparation of norbornene-2,3-dicarboxylic anhydride | 507,  510-514 | Diels-Alder reaction, NMR | Exp. 2 worksheet (10 points) |
| F 3 / 22 | 5. Separation of malachite green and phenolphthalein | 92-109 | Acid base extraction | Exp. 3 claim and evidence (10 points) |
| M 3 / 25 | **Quiz 1** |  |  |  |
| Tu 3 / 26 | 6. Prep. of cyclohexene from cyclohexanol | 376-380  122-128 | acid catalyzed dehydration  IR, NMR | Exp. 4 report (20 points) |
| W 3 / 27 | 7. Preparation of  “banana oil” \* | 417-426  182-199 | Fischer esterification,  SN2 substitution, IR, | Exp. 5 flowchart (20 points) |
| Th 3 / 28 | 8. Unknowns  8:30 AM Start | 169-181  239-265 | Solubility, chemical tests for functional groups, NMR | Exp.6 worksheet (20 points) |
| F 3 / 29 | 9. Preparation of a photochromic compound. | 564-566 | electrophilic aromatic substitution, nitration | Exp. 7 report (20 points)  Exp. 9 results & product are due one day after you isolate your crystals |
| M 4 / 01 | **Quiz 2** |  |  |  |
| Tu 4 / 02 | 10. Preparation of malachite green, crystal violet | 439-440 | Grignard reaction, preparation of dyes | Exp. 8 report  (30 points) |
| W 4 / 03 | 11. MOED Exploratory Lab\* | 627-633 | SN2, Knoevenagel condensation |  |
| Th 4 / 04 | 12. Prep. of cyclohexanone from cyclohexanol\* | 387-389  87-90 | oxidation, steam distillation, IR | Exp. 7 rewrite with commentary  (30 points) |
| F 4 / 05 | 13. Preparation of tetraphenylcyclopentadieneone | 595-597 | Aldol reaction, TLC |  |
| M 4 / 08 | **Poster presentations**  **Peer review**  **Check out of lab** |  |  | Exp. 11 poster (30 points)  Exp. 12 report complete rough draft for peer review |
| Tu 4 / 09 | Course review  Pizza frenzy |  |  | Exp. 12 report with peer review  (50 points) |
| W 4 / 10 | **Final Exam 9:00 - Noon** |  |  |  |
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**\*This is a longer lab. Be prepared to begin the laboratory procedure in the morning.**