Instructor: Prof. Michael Rubin, 5088 Malott Hall, mrubin@ku.edu
Laboratory Director: Dr. Marina Rubina, 4025 Malott Hall, mrubin3@ku.edu

Prerequisite: CHEM 331 and 335 (CHEM 335 can be taken concurrently, but not CHEM 331); fulfilling this prerequisite is absolutely essential to success in this course. In addition, you are expected to have been introduced to and have a working knowledge of structure determination by infrared (IR) spectroscopy.

Required material:

Required Web-based materials: TOPHAT. Access can be purchased online at http://www.tophat.com or through KU bookstores.


Notebook: A bound laboratory notebook with alternating carbon paper is required. You may continue the notebook you used in CHEM 331. Each page in the notebook must be numbered and dated. The first page must contain a Table of Contents. At the end of the laboratory period, teaching assistants will initial notebook pages containing new experimental data and will collect the carbon copies. DO NOT leave the laboratory before your notebook is inspected!

Lectures: Tuesday 9:30-10:45 am, Budig 130
Registration for the lecture session is required. Attendance in the lectures is strongly advised because a substantial amount of material not easily available from other resources and not directly related to the specific experiments will be presented. Spectral problem solving and some tips for exam preparation will be also provided ONLY during the lectures. As an additional incentive to attend lecture, lecture quizzes for credit will be offered (administered through TOPHAT).

Laboratories: Laboratories will be held once a week Monday through Friday (refer to the class schedule posted on Blackboard). Registration for one section of laboratories is required.

Zero points will be assigned for an unexcused missed lab, where no proper medical or other emergency excuse documentation is provided. More than two unexcused absences (lab periods only) will result in the failing grade for the course. If more than two excused absences are accrued, you will be required to take an incomplete for that semester and finish the course the next time it is offered.

If you (plan to) miss a lab, you must notify your TA and laboratory director ASAP and arrange to perform the missed experiment with another section within the same week. Maximum lab room occupancy of 20 people is mandated by Safety regulations, so you need to make sure that the section you are planning to join has a vacancy.
If you miss a lab due to an unplanned event such as illness or family emergency or required travel (for KU athletic team members and ROTC students only) and CANNOT make it up within the week the experiment is offered, you will have to present a valid document, explaining the reason of your absence and sign up for a special make up session that will be held at the end of the semester. Since the number of spots in the final make up session is limited, you will need an approval from the lab director to attend this session.

Unless clearly specified otherwise, all aspects of the work in the laboratory (lab quiz, pre-lab preparation, the experimental procedure, and the lab report) must be performed and completed individually by each student. Plagiarism will not be tolerated. Publication and sharing of any laboratory reports (in full or in part) in any hard copy or electronic form will be treated as plagiarism.

**Intellectual Property Policy:** Course materials prepared by the instructor, together with the content of all lectures (including video files, that will be posted on the course web site), tests (including the practice tests), and review sessions presented by the instructor are the property of the instructor. Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited. On request, the instructor will usually grant permission for students to audiotape lectures, on the condition that the audiotapes are used only as study aids by the individual making the recording. Unless explicit permission is obtained from the instructor, recordings of lectures and review sessions may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course.

**Safety:** You must familiarize yourself with "Safety Regulations for Laboratory Courses Numbered Below 698." Prior to the first laboratory session, you will need to take an online safety quiz and pass it with a score of 100% (unlimited attempts, score doesn’t count toward your grade). These materials are available on Blackboard under Safety Quiz.

The wearing of approved safety goggles with indirect vents (see image below) is mandated by State Law. Students found in the laboratory without approved goggles will receive a penalty of 10 pts. for each occurrence.

![Image of approved safety goggles]

**Examinations:** There will be two (2) examinations.

1. **MIDTERM EXAMINATION:** March 7, 8-10 pm, Budig 130
2. **FINAL EXAMINATION:** May 10, 7:30-10:00 am, Room TBA

**Quizzes:**

**Home pre-lab quizzes:** There will be total of 11 home pre-lab quizzes which will be assigned through
TOPHAT. Each quiz will cover the theoretical background for the experiment discussed in the relevant lectures, and the material presented in the assigned reading pertaining to the LABORATORY PROTOCOL and the TECHNIQUE. Please note that there will be NO MAKE-UP QUIZZES.

In Lecture quizzes: Each lecture will include a quiz, which will be administered through TOPHAT. Therefore, attendance in the lectures is strongly advised.

In-lab quizzes: Each lab period will begin with a short quiz (2-3 questions) administered and graded by your TA; maximum 5 points/quiz, part of the total of 25 lab points for each experiment. If you arrive more than 10 minutes late, you will not be permitted to take the lab quiz and will lose 5 points.

Advanced Laboratory Preparation: Both the initial portions of the notebook write-up, as well as any pre-lab assignment must be completed prior to each laboratory period. Refer to the LAB REPORT FORMAT and introductory lecture materials for details. Failure to complete the pre-lab write up will be reflected by a reduction in the grade for the Lab Report and Laboratory Technique.

Deadlines for Lab Reports and Products: your TA must check the notebook write-up (observation and results portion) and any product(s) by the end of the same laboratory period. Complete lab report is due at the beginning of the next lab period except when informed otherwise. Late results will not be accepted, unless they result from a legitimate and documented absence as determined by the course instructor and your TA. Reports must NOT be typed. All questions about graded lab reports must be brought to your TA's attention within a week after the graded work is handed back.

Lab Report Grading. Refer to CRITERIA FOR ASSESSMENT OF LAB REPORTS and LAB REPORT FORMAT documents posted on Blackboard. Lab report rubrics will be provided for each experiment. Each laboratory effort is worth 25 points toward your "experiments" grade. Missed lab quiz is -5 pts. Failure to present the pre-lab completed before lab is -5 pts. In experiments that involve synthesis or isolation of compounds, the compounds must be submitted in properly labeled containers at the end of the laboratory period. Proper presentation (e.g. vial labeling), yield and purity of the product will be reflected in the grade for the Lab Report and Laboratory Technique. Refer to the PRODUCT SUBMISSION GUIDELINES for details.

Technique Grade. This score will be assigned by your TA (and is not a subject for rebuttal with the instructor of the course) and will be based on:

1) Your understanding of what is going on in the lab
2) Preparation, and general confidence in performing experiments
3) Your contribution to the team effort
4) Day to day neatness, drawer/bench organization, and efficiency
5) Ability to draw conclusions form experimental data and recognize sources of error
6) Ability to handle and effectively use laboratory apparatus
7) Adherence to the safety rules and regulations.

Common Equipment and Balances: All shared equipment including balances must be kept clean and used according to the instructions of teaching assistants. Clean-up crews of two students will be assigned for each lab session to ensure proper cleanup of the common areas (e.g. hoods and balances). All students will participate in this duty.

Grading:

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
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<tbody>
<tr>
<td>Laboratory experiments</td>
<td>300 pts (12 @ 25 pts each)</td>
</tr>
<tr>
<td>Laboratory examinations</td>
<td>150 pts (60 pts and 90 pts)</td>
</tr>
<tr>
<td>Technique Grade</td>
<td>20 pts.</td>
</tr>
<tr>
<td>Home Pre-lab Quizzes</td>
<td>44 pts (11 @4 pts each)</td>
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<tr>
<td>Lecture Quizzes</td>
<td>36 pts. (12 @ 3 pts each)</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>550 pts.</strong></td>
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Final Letter Grades: The following grading scale will be used, with rounding (i.e. A/A- cutoff will be 92.5%). A small curve may be applied if the class average warrants.

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>93% - 100%</td>
<td>A</td>
</tr>
<tr>
<td>90% - 92%</td>
<td>A-</td>
</tr>
<tr>
<td>87% - 89%</td>
<td>B+</td>
</tr>
<tr>
<td>83% - 86%</td>
<td>B</td>
</tr>
<tr>
<td>80% - 82%</td>
<td>B-</td>
</tr>
<tr>
<td>77% - 79%</td>
<td>C+</td>
</tr>
<tr>
<td>73% - 76%</td>
<td>C</td>
</tr>
<tr>
<td>70% - 72%</td>
<td>C-</td>
</tr>
<tr>
<td>67% - 69%</td>
<td>D+</td>
</tr>
<tr>
<td>63% - 66%</td>
<td>D</td>
</tr>
<tr>
<td>60% - 62%</td>
<td>D-</td>
</tr>
<tr>
<td>Below 60%</td>
<td>F</td>
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</tbody>
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Notes on Grading:

*Letter grades will not be assigned to individual laboratory reports, quizzes, or exams.*

*Grades from the lab sections will be normalized at the end of the semester to adjust for differences in TA grading scales to the same average (ca. 80%).*

**DISABILITY ACCOMMODATIONS:** The Academic Achievement & Access Center (AAAC) coordinates accommodations and services for all KU students who are eligible. If you have a disability for which you wish to request accommodations and have not contacted the AAAC, please do so as soon as possible. Their office is located in 22 Strong Hall; their phone number is 785-864-4064 (V/TTY).

Information about their services can be found at [http://disability.ku.edu](http://disability.ku.edu). Please also contact me privately in regard to your needs in this course.

**ACADEMIC MISCONDUCT:** Cheating, or the appearance thereof, including giving or receiving help on an exam, plagiarizing (in part or in whole) laboratory reports, looking at another student's paper while taking an exam or quiz, falsifying exam papers or experimental data, using unauthorized materials, notes, crib sheets, or the equivalent, will not be tolerated and will be dealt with in accordance with University regulations (see [http://www2.ku.edu/~unigov/usrr.html#art2sect6](http://www2.ku.edu/~unigov/usrr.html#art2sect6)). The Chemistry Department reserves the right to make and keep copies of individual examination papers and laboratory reports.

**PLEASE REFRAIN FROM THE FOLLOWING ACTIVITIES DURING LECTURE:**

1) Talking to your neighbor(s)
2) Reading newspapers, playing games using any electronic gadgets
3) Preparing to leave while the instructor is still lecturing (unless the whistle has sounded)
4) Recording lectures without prior approval from the instructor