Chemistry 113A Organic Chemistry Laboratory (Sec 4)  
Spring 2016

Contact Information

Instructor: Mircea Gheorghiu, Ph.D.
Office Location: Science 140
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Email: mircea.gheorghiu@sjsu.edu
Office Hours: Tues/Thurs 10:30 a.m. - 11:20 a.m.
Class Days/Time: Lab: Tues/Thurs 2:30 p.m. - 5:20 p.m.
Classroom: Science 139
Prerequisites: CHEM 112A (with a grade of "C" or better; "C-" not accepted)

Faculty Web Page and MYSJSU Messaging
Course materials such as syllabus, handouts, notes, problem sets, etc. can be found on the Canvas web page for this course. I will also use the email address listed on your mySJSU account to send information on Chem 113A. You are responsible for checking for new files on Canvas and messages from me on your email on a regular basis to learn of any updates.

Course Description
This course introduces many of the basic techniques for synthesis, isolation, purification and identification of organic compounds. The emphasis is on practical laboratory skills. Sufficient theoretical background will be developed to allow the student to understand the design of experiments and to modify established procedures. The course will also provide practice in the formal writing of experimental procedures and findings. See the "Schedule of Experiments, Quizzes and Final" at the end of this document for important dates.

Required Texts/Readings

GREENSHEET AND SCHEDULE
You can access copies of this Greensheet and Schedule on the Chemistry Department website (http://www.sjsu.edu/chemistry/) - look for your section in the "Greensheets" link. It will also be posted on the Canvas site for your 113A section.

Textbook (IF YOU ARE A CHEMISTRY MAJOR, READ THE COMMENT ABOUT THE PAVIA TEXTBOOK)

Required Books
1) **Spring 2016 Chem 113A Lab Notes** available for purchase from the Chemistry Club (Duncan Hall 20 - cash only) - you must have your own copy by the second-class meeting.

**IMPORTANT:** you MUST have the current (Spring 2016) version of the Chem 113A Lab Notes - important procedural and safety changes have been made from prior versions. You must present your copy of your Lab Notes with your Exp A prelab notebook for approval.

2) Pavia, D. L., Lampman, G. M., Kriz, G. S., Vyvyan, J. R. *Introduction to Spectroscopy*, 5th ed., **SJSU version** (note this edition is a custom version available only at the SJSU Bookstore) - DO NOT obtain the electronic (eBook) version for this class. This is a new edition of this text; older editions will contain significant differences.

**CHEMISTRY MAJORS** WHO NEED TO TAKE CHEM 113B and/or 114 IN THE FUTURE SHOULD OBTAIN THE FULL EDITION OF PAVIA* - the SJSU Bookstore does not carry this edition, but it can be obtained from Amazon or other book sellers. You will need this version if you take Chem 113B and/or Chem 114.

*ISBN 978-1285460123 (needed starting the week of Feb 17)

Whichever version of Pavia you obtain, you must have your own PRINT copy when it is allowed during quizzes and exams - sharing is not allowed.

**Other Readings**


**Other equipment / material requirements**

- Scientific laboratory notebook with duplicate numbered pages - these are also available for purchase from the SJSU Chemistry Club
- Basic calculator (one that cannot connect to the internet, bring to every quiz/exam)
- Pencils, rulers

**Library Liaison**

The Chemistry Library Liaison is  Ann Agee (ann.agee@sjsu.edu)

**Course Requirements and Assignments**

**Catalog Description** Fundamental techniques for the isolation, characterization and synthesis of organic compounds. Prerequisite: CHEM 112A (with a grade of "C" or better; "C-" not accepted). Misc/Lab: Lab 6 hours.
You must have completed Chem 112A with a grade of "C" or better to enroll in Chem 113A. You may not take Chem 112A concurrently with Chem 113A. If you are repeating Chem 112A, you may not take Chem 113A until you complete 112A with a "C" or better. If you took an 112A-equivalent course at another institution, the instructor may ask for verification and information on the lab you took. The scheduled time for Section 4 is Tues/Thurs 2:30 p.m. - 5:20 p.m. in Science 139. It is mandatory that:

- you attend all meetings of this course (see attendance below) according to the schedule
- you are in the lab room at the beginning of every lab meeting. I will go over important safety items for the days' experiments; if you are not present to hear these instructions, I will not allow you to work in the lab for the day.

Chem 113A will include eight Experiments (A to H). You will prepare written reports for each of these Experiments. These reports must be submitted both on paper and to turnitin.com (via Canvas assignments). Eight laboratory quizzes based on these experiments will also be given, as well as a Midterm and Final Exam (see Schedule at the end of this document).

Dr. Straus has created a website for Chem 113A that provides a wealth of information for this course, including information for each lab experiment, as well as videos and photos depicting most of the techniques you will be performing in Chem 113A. You should bookmark this site and refer to the relevant sections before each lab meeting and as you prepare your reports:

http://www.chemistry.sjsu.edu/straus/visioche.htm

**Check-In Policy**

If you check-in to a locker for Chem 113A on the first day of class, you will be indicating to us on the Locker Card Form that you intend to remain in this course. If you later drop Chem 113A, a $50 Locker Fee will be assessed.

**Course Goals and Learning Objectives - Chem 113A**

• Students will be able to demonstrate their knowledge of departmental safety rules through their laboratory practice, including the ability to dispose of waste properly.

• Students are expected to apply basic stoichiometric algorithms (such as calculating limiting reagents, theoretical yield and mole ratios) in the context of organic chemistry.

• Students will be expected to demonstrate a command of the rules for assigning significant figures in their work, specifically in calculations and laboratory measurements and calculations.

• Understand and be able to use the basic operations of an organic chemistry laboratory including gravity & vacuum filtration, liquid-liquid extraction, distillation, reflux, recrystallization, drying of solids and solutions, and the theories behind these techniques.

• Know the significance of pKa values in experimental steps.
• Identify and assess the purity of organic compounds using analytical techniques including melting point, thin layer chromatography (TLC), IR (v.i.\(^1\)), NMR (v.i.), and gas chromatography (GC).

• Deduce organic structures using spectroscopic methods: especially infrared (IR) and nuclear magnetic resonance (NMR) spectroscopy.

  - determine molecular formulas from structures, molecular mass (using the Rule of 13), and other sources of information.
  - be able to deduce hydrogen deficiency index (HDI) from a molecular formula and use this in structure determination.

For NMR spectroscopy, students will be able to:

  - understand the fundamental theory of 1-dimensional proton NMR analysis
  - understand the concepts of equivalent and non-equivalent hydrogens.
  - understand the effect of structure on chemical shift and coupling constants.
  - demonstrate awareness of the regions of the NMR spectrum where various key protons are found.
  - calculate chemical shifts for substituted alkanes and aromatics using tables.
  - demonstrate how to utilize integrals for structure analysis
  - construct splitting diagrams (“trees”) and be able to measure coupling constants from an NMR spectrum, or predict coupling constants and trees from a structure.
  - recognize and know how to test for exchangeable hydrogens in a molecule.
  - identify the peaks that correspond to the solvent and to the internal reference (TMS).
  - deduce unknown structures and fully assign an NMR spectrum to the structure.

For IR Spectroscopy, students will be able to:

  - explain the basic principles of IR spectroscopy.
  - identify and explain factors that influence the strength and frequency of an IR peak.
  - assign key peaks in an IR spectrum.
  - determine which peaks are most diagnostic in making an assignment of structure using IR.

\(^1\) Latin vide infra (see below)
- record an IR spectrum.
- deduce unknown structures and fully assign an IR spectrum to the structure.

• Students will be able to follow a detailed experimental procedure, and construct a flow diagram to illustrate it.

• Students will be able to explain the theory behind the operations performed, including being able to explain deviations from the theoretically optimum results (which is the usual case), and suggest improvements to the procedures employed.

• Students will be able to depict and explain detailed chemical mechanisms for all laboratory reactions employed in Chem 113A, and for related reactions.

• Students are expected to keep contemporaneous notes – They will demonstrate the ability to maintain a proper lab notebook.

• Students will be able to construct a lab report that includes an analysis of the data collected, and discussion of the outcomes and answers to open questions associated with the Experiment.

Program Learning Outcomes (PLO)

Chemistry 113A satisfies the following Program Learning Outcomes for the Chemistry Department:
PLO #2 - Demonstrate understanding of core concepts and to effectively solve problems in organic chemistry.
PLO #6 - Answer questions regarding safe practices in the laboratory and chemical safety.
PLO #7 - Demonstrate safe laboratory skills (including proper handling of materials and chemical waste) for particular laboratory experiments.

Tentative Course Calendar:

A schedule of experiments, report due dates and lab quizzes appears at the end of this Greensheet (also posted on the Chemistry Department homepage and on the Canvas page for this course). In addition, note the following EXAM dates:

<table>
<thead>
<tr>
<th>Date</th>
<th>Exam Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Mar 24</td>
<td><strong>Midterm Exam</strong> (90min during lab session)</td>
</tr>
<tr>
<td>Monday, May 23</td>
<td><strong>Final Exam</strong> (2:45 p.m. to 5:00 p.m.)</td>
</tr>
</tbody>
</table>

This is a tentative schedule and is subject to modification (the Midterm, Final Exam and due date for the last experiment will not change). Any changes will only be announced during lab meetings only (no notice will be sent by email). It is your responsibility to keep aware of the schedule, especially due dates of reports, quizzes and exams. You must be present on all quiz and exam dates - do not plan any travel or other absences on these dates. Makeup quizzes are not provided if you come late or are otherwise not present when a quiz is given.
SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf

Attendance Policy / Lab Makeup

NOTE that University policy F69-24, “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

Your attendance is mandatory for ALL Chemistry 113A lab meetings. The semester schedule is set to provide just enough time for most students to complete all of the experiments. Missing labs will cause you to fall behind and options for makeup are limited (see below). Keeping on time with the schedule requires both your attendance and significant amount of preparation before each lab meeting.

*If you cannot attend all lab meetings due to your work, travel, or other reasons, you should not enroll in Chem 113A.*

For Chem 113A, you MUST arrive by the stated start time of each lab session. At the start of every lab, the instructor will give important instructions for that day's experiment, including critical safety issues that you must be aware of to conduct the experiment safely. If you arrive late, you will not be allowed to work on that day - the instructor will not repeat safety and other information for any late students. No makeup is possible if you miss a lab due to late arrival.

*This rule will be strictly enforced so plan your schedule to arrive on time!*

Makeup of labs may be possible in only certain circumstances and is not guaranteed. In general, only unexpected circumstances such as medical reasons with a doctor's note will be considered. A "Permission to work in organic chemistry labs" form must be signed by me and presented to the other lab instructor (which must be the another section of Chem 113A). However, the other instructor may choose to not accommodate a makeup student, so obtaining a permit does not guarantee additional time to work. Work permits will not be granted due to falling behind due to poor preparation, or missing labs due to travel or other unauthorized absences (e.g. studying for exams for other courses). There must be a valid reason with documentation (such as a doctor's note) attached to the permit. If you miss a lab or leave early, you will lose points from your experiment grade since your notebook will not be countersigned by the instructor.

Each lab period is 2 hours and 50 minutes. If you finish your lab work early, you should use the remaining time to work on prelabs, structure problems, or on Experiment H. Instructors will not countersign your notebook if you leave early. There will always be
sufficient work for you to utilize the entire lab period, so you should not leave before the end time.

**Grading Policy**

**GRADING** (see below for numerical breakdown and percentages)

**Laboratory Reports**: Eight reports will be due for Chem 113A. The format for each varies somewhat, information is provided below (Laboratory Reports) and on the Chem 113A website for each experiment (see "writeup"). Points are deducted for reports turned in after the due date for that report (up to -2 pts./day). See below for more information on late reports. The writeup section of your report must also be submitted to Canvas "Assignments" before the start of the lab period in which the report is due. Submitted reports will be analyzed by turnitin.com and an analysis of your report will be provided to me.

**Laboratory Notebook Countersign points** - at the end of each lab day, you must present your lab notebook to be countersigned by the instructor. If not signed, **2 points per missing signature will be deducted from the total grade for that report**. Signatures will not be given once a lab period is over or if you miss a lab due to an unexcused absence. **Signatures will only be given in the last 20 minutes of the lab period - if you finish your lab work early, this does not mean you can leave! You should work on your lab notebook for the next experiment, spectroscopy problems, clean your dishes, or other lab work.**

**Lab Quizzes**: A total of 8 laboratory quizzes based on the experiments will be given at the start of certain lab periods - see Schedule. These will be brief quizzes based on the experiment that was just completed. Note Experiment B has 2 lab quizzes.

**On Experiment Due Dates**: Your complete experiment reports and submission to turnitin.com are due at the **start** of the lab period indicated by the due date. Once the reports are collected a Lab Quiz will be given, usually in the first 5-10 minutes of the lab period. You must be present to take the lab quiz - no makeups will be provided if you arrive late or are absent. Reports are "late" if any component is turned in after the lab quiz has begun (see below).

**Midterm Exam**: a midterm exam based on material covered to that point will be given.

**Final Exam**: a comprehensive Final Exam will involve all topics covered in Chem 113A.

Note that the final 113A grade is based on a conglomerate of the individual graded items. Thus, if you have a somewhat low grade on one item, you can make it up with a better grade of another item. The course grades are given on a "+/-" system, and the instructor may modify the point total up to 10% higher or lower based on a student's performance in the lab (such as preparation and efficient use of time, general lab skills, etc.).
quizzes and exams. You are required to bring your OWN copy for the exams. Sharing of books during tests is not allowed. Using any device which has access to the Web is prohibited during any 113A quiz or exam.

**Grading information:**

The grades for this course will be assigned as "plus/minus." The percentages and types of graded items will be based on the following categories:

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 laboratory reports</td>
<td>450 points</td>
</tr>
<tr>
<td>8 laboratory quizzes</td>
<td>100 points</td>
</tr>
<tr>
<td>Midterm</td>
<td>150 points</td>
</tr>
<tr>
<td>Final exam @ pts</td>
<td>300 points</td>
</tr>
<tr>
<td>Total possible for 113A</td>
<td>1000 points</td>
</tr>
</tbody>
</table>

\[a\] Experiments A, C, D, E, F, and G - 50 points; Experiments B and H - 75 points

\[b\] Quizzes A, B1, B2 and C - 10 points; Quizzes D, E, F and G/H - 15 points

The overall course grade will generally follow the following correlations:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>100-97%</td>
</tr>
<tr>
<td>A</td>
<td>96-93%</td>
</tr>
<tr>
<td>A-</td>
<td>92-90%</td>
</tr>
<tr>
<td>B+</td>
<td>89-87%</td>
</tr>
<tr>
<td>B</td>
<td>86-83%</td>
</tr>
<tr>
<td>B-</td>
<td>82-80%</td>
</tr>
<tr>
<td>C+</td>
<td>79-77%</td>
</tr>
<tr>
<td>C</td>
<td>76-73%</td>
</tr>
<tr>
<td>C-</td>
<td>72-70%</td>
</tr>
<tr>
<td>D+</td>
<td>69-67%</td>
</tr>
<tr>
<td>D</td>
<td>66-63%</td>
</tr>
<tr>
<td>D-</td>
<td>62-60%</td>
</tr>
<tr>
<td>F</td>
<td>&lt;59%</td>
</tr>
</tbody>
</table>

Late reports beyond a deadline will be assessed a penalty of up to **-2 points per day past the due date (weekend days will count as -2 points each day)** - medical absences with documentation will be considered. The report is considered fully "turned-in" when all required items are submitted. Late reports for Experiments will be accepted only up until graded reports are returned to the class (i.e. late reports will not be accepted once I return the graded reports to the rest of the class).

The reports for Experiments G and H must be received by the due date shown on your schedule. **No reports will be accepted after the last lab meeting of the semester (the check out day for your section).**

All experiment reports are mandatory: for each report not turned in, up to 10 points will be deducted from the total points accumulated for the semester.

For security reasons, final course grades are not posted, sent by email, or given over the phone. If you would like a breakdown of your 113A scores, leave a stamped and addressed envelope with me at the final exam.

Use the 113A schedule below to plan your time accordingly. Preparation for the lab will help you immensely to keep on schedule.

For upper division courses (R, S, V) include the following statements:

“A minimum aggregate GPA of 2.0 SJSU Studies (R, S, & V) shall be required of all students as a graduation requirement.” To see full text, review University Policy S11-3 at
Equipment

A printed copy of current Stockroom policies will be provided to you when you check-in to a locker. These policies will be rigidly enforced so read them immediately.

You will be assigned an individual locker of equipment for your use during this course. You will be checked into your locker during the first lab period by the instructor, and sign an acknowledgement that you have all of your equipment. **Your check in day is the only day when missing or broken/chipped items will be replaced at no charge.**

After the first day, you are responsible for maintaining all of the contents of your drawer. If you lose or break any item, you will be assessed a replacement fee at the end of the semester, so be careful with your equipment! It is possible to complete this course with a relatively small bill for expendable items; it is also possible to end up with a $100 bill due to loss or breakage. At the end of each lab period, make sure you have collected all your locker items before leaving and lock your drawer!

When you check in, you will be given a coded check out pad from the storeroom. You may use this pad to check out additional equipment from the storeroom which may be required for a particular experiment. **Note that certain items checked out must be returned the same day to avoid a late fee.** Remember, the code on your pad is assigned ONLY to you, don't lose it, or someone else can check out items which will be charged to your account.

At the end of the semester, you must clean out your locker, replace all broken equipment or glassware, and have the instructor sign the check-out form. If this process is not completed fully, you may be charged a fee to clean and refurbish your locker. If you drop or do not complete Chem 113A, you must check out of your locker to avoid a $50 or more check out fee. **You must check out no later than the check out day for your section** (see Schedule).

Classroom Protocols for Chem 113A:

Schedule:

The detailed schedule at the end of this greensheet gives dates on experiments and due dates. quizzes and exams. In most cases, a prelab lecture about each experiment will be given before the "begin" date of each experiment. In addition, supplemental lectures will be given as needed. The Schedule is subject to change and changes will be announced in class. However, the midterm or final exam dates will not change.

Preparation for Experiments:
In order to be allowed to begin each Experiment, you must prepare a "Prelab writeup" in your notebook prior to the start of that experiment, and have it approved by me. On the Chem 113A website, under "Course Handouts" see "Notebook Format" - the prelab should be completed for each experiment from items A to I. If anything is missing or erroneous, you will be required to correct the item, which will delay when you start the experiment.

A "Sample Prelab for Exp A" is found on the Chem 113A website under "Course Handouts." For this one experiment only, you may copy this information in your notebook and show it to me as your prelab. For subsequent experiments, use this as a
template and provide similar information when you prepare those Prelabs. The importance of the Prelab is not only so you know the details of the experiment, but also so that you are aware of any safety issues that may be involved. Under no circumstances are you to begin working on a lab experiment without my approval - if you do so, this will be grounds to be dropped from this lab section.

Obviously, if you have to work on a prelab during the lab period, you will seriously deprive yourself of adequate lab time to complete the experiment. The lab schedule is arranged so there should be adequate time to complete each experiment within the allotted dates, but only if you come prepared for each lab.

When I have approved your prelab, I will sign your Lab Report Summary sheet (found in the last pages of your Lab Manual and also on the website) and provide you with the starting material for your experiment.

Observations and Data in Lab Notebooks:
As stated above, lab notebooks will be a component of your grade. They must be kept up to date on a daily basis with details of your results and progress. The format for lab notebooks and data collection can be found in the Chem 113A website, under the drop down menu for "Course Handouts.” All of these files contain useful information that will guide you in preparing notebooks and reports for the entire semester.

The preliminary write-up of all notes and observations must be kept in a bound notebook that has pre-numbered duplicate pages. All entries must be made in pen - NEVER erase or use "white out"! RECORD ALL OF YOUR NOTES AND OBSERVATIONS DIRECTLY INTO THE NOTEBOOK, AND AS THEY OCCUR. In other words, don't write down numbers on scraps of paper and transfer them later, or try to memorize your measurements. The main purpose of the notebook is to be a daily "journal" for your laboratory activities to which you, or someone else, can read at a later date, and fully understand what you did, how you did it, and why the results came out the way they did. It's OK to scratch out entries - the main point is that it is organized and understandable.

As you'll learn, in professional situations the lab notebook is considered a legal document, and there are rules about how they are prepared and maintained. A typical practice is to have the notebook "countersigned" at the end of each lab day by someone else. For Chem 113A, I will countersign all notebooks (no sooner than 20min before the lab ends) - this means you must show me your notebook before you leave each day to review and sign. When grading reports, up to two points will be deducted per lab day if my signature is missing. This also applies if you miss a lab due to an unexcused absence.

Lab Reports:
After the experiment is finished, analyze your data and write your conclusions in your notebook. Again, in the Chem 113A website, Dr. Straus has provided guidelines for writing your notebooks under "Course Handouts" see "Notebook Format" You will also find information to format your report at the end of each experiment in your Chem 113A Lab Manual under the "writeup" file - here we give you the key points that must be included in each report.
Each report should follow the format designated for that type of experiment; in this class. There are two kinds of experiments, preparative and investigative; formats for the two differ (see Notebook Format on the 113A website). Reports must be complete, well organized and legible. Every Experiment has one or more "questions" that must be analyzed and justified. Under the "write-up" tab for every experiment on the Chem 113A website, we give you information on what should be included in each writeup. Do not take inordinate amounts of time for picture-perfect drawings, these will not improve your grade.

*Your written reports must be submitted to Canvas Assignments before you come to class on each due date.*

Reports are to consist of your own thoughts and be expressed in your own words (see Academic Honesty below). The purpose of these reports is to give me an opportunity to evaluate your comprehension of the experiment and results. If you copy information from another source, whether you give credit or not, it provides me with no basis to gauge your understanding. You should always cite the source of information (use superscripts to your references), but do not copy any portion from another source word-for-word - always re-word the passage.

Do not use another student's report as a template for your report, as turnitin.com will "flag" both reports as being plagiarized - an excessive amount of plagiarism may result in a grade of zero "0" points for that paper. The best advice is to work on your paper on your own to avoid problems.

**REPORT SUBMISSION:**

**All of the following must be submitted on a report due date:**

- **PRIOR to coming to class,** you must submit your report to your Canvas Assignments page. From your mySJSU account, find the Canvas link and the folder for Assignments for Chem 113A. Upload your report to the appropriate 113A experiment. When submitted, it will automatically be screened by turnitin.com for originality. Note that once submitted, a report cannot be changed.

- **IN CLASS** submit your report package consisting of:

  - Lab Report Summary sheet (signed by me)
  - duplicate pages from your notebook (make sure all the writing is legible!)
  - writeup (identical to what was submitted to turnitin.com)
  - Product (if required), see how to submit products below
  - any supporting information such as GC, IR, NMR
    (make sure your name is written on all items!)

To be considered "on time," **ALL** of the above must be submitted before the experiment quiz is given in lab. If any component is not submitted before the quiz, the entire report will be considered "late," and late point deductions will apply. For example, if you turn in the paper copies before the quiz, but submit to Canvas after the quiz, the report is not complete and will be graded as "late." (or vice versa) A report will not be graded until all of the components listed are submitted - late points will be deducted until all components are received.
Late reports: Your grade for late reports will be lowered by two points per day the report is late (including weekends). Exceptions will only be made if a valid medical excuse is presented in writing to the instructor. Reports for G & H will not be accepted after the last lab meeting of the semester (check out day for your section).

The time during each lab period should to be used for lab work, not for writing prelabs or reports.

PRODUCTS:
The preparative experiments involve chemical synthesis, the conversion of one substance (the starting material, a measured sample of which is provided) into a different organic compound (the product). The products of such preparations must be submitted for grading in a vial with a cork or clean polyethylene cap (organic liquids often attack rubber stoppers or black plastic screwcaps). All products must be labeled as follows:

<table>
<thead>
<tr>
<th>NAME OF COMPOUND</th>
<th>% YIELD</th>
<th>WEIGHT</th>
<th>mp or bp</th>
<th>STUDENT’S NAME</th>
</tr>
</thead>
</table>

(Paper labels and Scotch tape are available from the service center - don't write on glass.) The weight is that of the actual contents only, not the vial. The melting point and boiling point ranges are those actually observed for your sample; these will be checked for grading and a significant penalty will apply for misrepresented data. Points will be deducted for any visible foreign material (dirt, filter paper, cork chips, etc.). Products will also be evaluated by appearance and odor. Improperly or incompletely labeled samples will not be accepted for grading.

SAFETY

Before beginning any lab work, the following items must be completed:
1) Attend the Safety Lecture
2) Read and sign the statement on Chemical Safety for Chemistry Labs (paste into your browser):
   http://www.sjsu.edu/chemistry/docs/Safety_Sheet_IIC.pdf
3) View the Chemistry Safety film and sign the viewing voucher
4) Take the Lab Safety Quiz and obtain a score of 80% or better; retake the quiz if score is <80%.

All of the above conditions are required, and must be completed before you will be allowed to work in the lab!

In addition to the points covered above, the following rules are emphasized in this lab:
1. **AS SOON AS ONE PERSON BEGINS WORK IN THE LAB, YOU MUST ALWAYS WEAR SAFETY GOGGLES, EVEN IF YOU ARE NOT DOING ANY WORK YOURSELF!!!** (over your eyes, not on your forehead!) If you see a fellow student not wearing eye protection, you are obligated to remind them to protect their eyes.

2. Be aware that we will be using some flammable solvents, do not have any flames when you (or someone else in the room) are handling these.

3. Similarly, treat all acids, bases, and reagents as potential hazards. Avoid skin contact with all of these, and treat any contact immediately. If you have a spill, never leave it unattended - let the instructor know.

4. Dispose of all glassware in the special bins, not in the trash cans! This includes broken glass, as well as expendable items such as pipettes and melting point capillaries.

5. Some experiments require special safety precautions - these may be found in the protocols or given by the instructor. Always enter these into your procedure/flow scheme section in your notebook (this is another reason to read ahead and to be on time at the start of each lab).

6. You are **absolutely** required to follow any instructions provided by the instructor related to procedures and/or safety. Failure to do so will result in your grade or result in immediate disenrollment from this class (see statement below).

7. Everyone working in the lab is expected to conduct yourself in a professional manner; no horseplay or unsafe actions are allowed.

8. Gloves are required for many experiments. These are always available from the Stockroom for a cost. You may prefer to purchase a box of disposable gloves to use during the semester.

9. Minimize contact with all liquid and solid chemicals, and DO NOT intentionally breathe in any vapors. Where practical, do experimental work in the hoods.

10. If you are not sure, ask!!

Failure to comply with proper procedures and prescribed safety cautions shall subject the student to disciplinary action.

1) Any student who engages in unauthorized experimentation, or who seriously disregards safety, thereby endangering self or others shall be withdrawn immediately from the class with a grade of F.

2) Any student who shows persistent disregard for safety may have his/her grade lowered, and may risk being withdrawn with a final grade of F.

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**Special rules of safety and conduct apply when using the Varian Mercury 300 NMR and the GC and other instruments. These will be provided by the instructor.**

With preparation and organization, it is possible to complete all of your lab work during the scheduled lab period. In general, no lab work will be permitted outside of the scheduled lab times. Usually, the only situation where this may be allowed is in cases of illness and for which you provide verification by your doctor (see makeup policy above). However, if you miss more than a few lab periods during the semester, it may be difficult to complete the course. **In any case, under NO circumstances are you to perform any laboratory work for 113A outside of the scheduled lab time without my written permission.** Any student found performing unauthorized lab work for 113A may be disenrolled from the class.
Visitors: No visitors are allowed in the lab at any time. If someone is waiting for you, they must wait outside the lab.

Cell Phones, music/video/game players: These may not be used in the lab. Unless you have an emergency, turn off cell phones and make your calls before or after class. DO NOT make calls when an experiment is in progress!

Computers: You may use your laptop only during class lectures. Once lab work begins, put your computer away since they will take up valuable space on the bench and may be damaged by chemicals or spills. If necessary, you can use the iMacs in Sci 139 and 154, and 4 PCs in the melting point room.

While working in the lab, distractions while working must be kept to a minimum - this includes music and videos. Headphones or earbuds may not be used - you must be able to hear instructions or emergency situations.

Chemical Safety (CHEM 120S)
Chemistry 120S (Chemical Safety) is a required course for all Chemistry majors and minors, and a prerequisite for all students involved in Chemistry 180 or 298 research courses.

Academic Integrity:

No form of cheating, copying, or other unfair advantage will be tolerated, and will be dealt with severely. All reports must be submitted to turnitin.com, which will provide a report on originality for each paper. Turnitin.com gives a quantitative index if a paper is substantially copied from a previously submitted report or other reference source. A first infraction will result in “0 points” for that experiment or exam. A second will result in an automatic grade of "F" for the course. The underlying principle will be fairness to all students in the course. In particular, copying or plagiarism (the excessive use of someone else's words, even if acknowledged, see the section from the Academic Senate below) is considered a serious offense, especially with regard to the formal lab reports. Note that simply "re-ordering" words from another source does not constitute an original paper, and will be "flagged" by turnitin.com. You must use your own words and analysis in all reports for this course - do not copy or cite sentences or passages from any other source!

Additionally, when you work on and turn in a report, it is expected that the works your own only. While you may get general advice from your classmates and faculty members, you may not ask others to analyze your data for you. This includes faculty members at SJSU or other colleges/universities, trained professionals in the field, or any commercial services.

From the Office of Student Conduct and Ethical Development: “Your own commitment to learning, as evidenced by your enrollment at San Jose State University, and the University’s Academic integrity Policy requires you to be honest in your academic course work. Faculty are required to report all infractions to the Office of Student Conduct and Ethical Development. The policy on academic integrity can be found here:
<table>
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<th>From the SJSU Academic Senate Resolution S04-12</th>
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### 1.2 PLAGIARISM:

At SJSU **plagiarism** is the act of representing the work of another as one's own (without giving appropriate credit) regardless of how that work was obtained, and submitting it to fulfill academic requirements. Plagiarism at SJSU includes but is not limited to:

1.2.1 The act of incorporating the ideas, words, sentences, paragraphs, or parts thereof, or the specific substance of another's work, without giving appropriate credit, and representing the product as one's own work; and

1.2.2 Representing another's artistic/scholarly works such as musical compositions, computer programs, photographs, paintings, drawings, sculptures or similar works as one's own.

**BE SURE YOU UNDERSTAND WHAT PLAGIARISM MEANS. IF NOT, ASK!!**

### University Policies

#### Dropping and Adding

Switching Sections: This is very difficult to manage due to the high demand for every seat in Chem 113A. If you can find a student in the other section to switch with you, it may be possible to arrange an official swap. HOWEVER, I or any 113A instructor cannot assist with arranging this, and the likelihood is very small. Do not drop from your enrolled 113A section in the hope (unlikely) you will get in to another section. If you have a seat, my recommendation is to keep it and arrange your schedule to accommodate the lab. If it cannot work no matter what, please inform me that you must drop from 113A.

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at [http://info.sjsu.edu/static/catalog/policies.html](http://info.sjsu.edu/static/catalog/policies.html). Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/)

The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at

[http://www.sjsu.edu/aars/policies/latedrops/policy/](http://www.sjsu.edu/aars/policies/latedrops/policy/)

Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advisinghub/).
Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7,
http://www.sjsu.edu/senate/docs/S12-7.pdf

requires students to obtain instructor’s permission to record the course.

• “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. **You must obtain the instructor’s permission to make audio or video recordings in this class.** Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”

• “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

• **General Expectations, Rights and Responsibilities of the Student Policy**

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU’s policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. See University Policy S90–5 at

http://www.sjsu.edu/senate/docs/S90-5.pdf

More detailed information on a variety of related topics is available in the SJSU catalog, at

http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html

In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

**Academic integrity**

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. **The University Academic Integrity Policy S07-2 at**

http://www.sjsu.edu/senate/docs/S07-2.pdf

requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The **Student Conduct and Ethical Development website** is available at

http://www.sjsu.edu/studentconduct/
Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU’s Academic Integrity Policy S07-2 requires approval of instructors.

**Campus Policy in Compliance with the American Disabilities Act**
If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at

http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf

requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at

http://www.sjsu.edu/aec/

to establish a record of their disability.

**Emergencies and Building Evacuations**
If you hear a continuously sounding alarm, or are told to evacuate the building by an Emergency Coordinator, walk quickly to the nearest exit (out the lab door and go to the nearest exit of the Science Building). Take your personal belongings as you may not be allowed to return. Follow the instructions of the Emergency Coordinators. Be quiet so you can hear instructions. Once outside, move away from the building. Do not return to the building unless the Police or the Emergency Coordinator announces that this is permissible.

Following are resources that are available to all students. They may apply to this course as well as other courses you are taking.

**Student Technology Resources**
Computer labs for student use are available in the Academic Success Center at

http://www.sjsu.edu/at/asc/

located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

**SJSU Peer Connections**
Peer Connections, a campus-wide resource for mentoring and tutoring, strives to inspire students to develop their potential as independent learners while they learn to successfully navigate through their university experience. You are encouraged to take advantage of their services which include course-content based tutoring, enhanced study and time management skills, more effective critical thinking strategies, decision making and problem-solving abilities, and campus resource referrals.

In addition to offering small group, individual, and drop-in tutoring for a number of undergraduate courses, consultation with mentors is available on a drop-in or by appointment basis. Workshops are offered on a wide variety of topics including preparing for the Writing Skills Test (WST), improving your learning and memory, alleviating procrastination, surviving your first semester at SJSU, and other related topics. A computer lab and study space are also available for student use in Room 600 of Student Services Center (SSC).

Peer Connections is located in three locations: SSC, Room 600 (10th Street Garage on the corner of 10th and San Fernando Street), at the 1st floor entrance of Clark Hall, and in the Living Learning Center (LLC) in Campus Village Housing Building B. For more information visit Peer Connections website at http://peerconnections.sjsu.edu

SJSU Writing Center

The SJSU Writing Center is located in Clark Hall, Suite 126. All Writing Specialists have gone through a rigorous hiring process, and they are well trained to assist all students at all levels within all disciplines to become better writers. In addition to one-on-one tutoring services, the Writing Center also offers workshops every semester on a variety of writing topics. To make an appointment or to refer to the numerous online resources offered through the Writing Center, visit the Writing Center website at http://www.sjsu.edu/writingcenter.

For additional resources and updated information, follow the Writing Center on Twitter and become a fan of the SJSU Writing Center on Facebook. (Note: You need to have a QR Reader to scan this code.)

SJSU Counseling Services

The SJSU Counseling Services is located on the corner of 7th Street and San Fernando Street, in Room 201, Administration Building. Professional psychologists, social workers, and counselors are available to provide consultations on issues of student mental health, campus climate or psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit Counseling Services website at http://www.sjsu.edu/counseling
Chem 113A  Spring 2016 - Tues/Thurs Sections

Any changes to this schedule will be announced by your instructor in advance and only in your lab section. Prelabs for each Experiment will be given at an appropriate time for your section - you must be present to learn of important experimental and safety instructions.

On report due dates, to be "on time" you must A) submit your report to turnitin.com before lab begins, AND B) submit a complete paper copy of your report before the lab quiz begins. A lab quiz will be given based on the experiment just turned in (or on spectroscopy topics as given by your instructor).

General Schedule of Experiments (see calendar below for dates)

<table>
<thead>
<tr>
<th>Experiment A</th>
<th>Synthesis of Aspirin</th>
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<tr>
<td>Experiment B I &amp; II</td>
<td>Separation and Identification of an Unknown Mixture (Spartacetin)</td>
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<tr>
<td>Experiment C</td>
<td>Introduction to IR and NMR Spectroscopy</td>
</tr>
<tr>
<td>Experiment D</td>
<td>Distillation and GC of an Unknown Alcohol Mixture</td>
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<td>Experiment E</td>
<td>Esterification of an Unknown Alcohol</td>
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<td>Experiment F</td>
<td>Preparation of a 2,4-DNP Derivative of an Unknown Ketone</td>
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<td>Experiment G</td>
<td>Oil of Cloves</td>
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<td>Experiment H</td>
<td>Spectroscopic Identification of an Organic Unknown II</td>
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</table>

Details of each Experiment, techniques and other supporting information can be found on the Chem 113A website:

http://www.chemistry.sjsu.edu/straus/visioche.htm
(or simply Google "SJSU Chemistry 113A")

Chem 113A Spring 2016 Calendar TuesThurs Sections

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|     |     |     |     | Finish A  
Begin B1 |     |     |
| 14  | 15  | 16  | 17  | 18  | 19  | 20  |
|     |     | Finish B1  
Begin BII |     | Quiz B1 (no report)  
Cont. BII |     |     |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  |
|     |     | Finish BII  
Begin C - IR Lecture Distribute "H" |     | Cont. C - 1st NMR lecture |     |     |

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<td>Exp B I &amp; II due &amp; Quiz Cont C - more NMR &amp; problems</td>
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**ALL reports are due on the last lab meeting for your section (NOT on the final exam day!)

Monday, May 23  
**Final Exam** (2:45 p.m. to 5:00 p.m.)

Unless otherwise indicated, your final exam will be in your normal lab room.