CHEM 112L Syllabus
Summer 2016

CRN  | Sec | Day | Time           | Instructor      | Email            | Prelab Room |
-----|-----|-----|----------------|-----------------|------------------|-------------|
30097| 01  | TWR | 8:30 am - 11:30 am | Dr. Amy Rogers  | rogersaL@cofc.edu | SSMB 115    |
30098| 02  | TWR | 2:00 pm - 5:00 pm  | Prof. Cat Potter | cpotter@cofc.edu  | SSMB 115    |

All sections in Rm 115 SSMB

Instructor: Dr. Amy L. Rogers  
Office: Rm 308 SSMB (School of Sci & Math Bldg)  
Phone(c): (843) 953-7292  
Email: rogersaL@cofc.edu

Office Hours: By appointment

Co-requisite: CHEM 112

Learning Outcomes:
- Develop an understanding of the scientific method in a chemistry laboratory setting
- Employ mathematical manipulations using acquired data
- Interpret scientific data

General Education Learning Outcomes:
1. Students apply physical/natural principles to analyze and solve problems.
2. Students develop an understanding of the impact that science has on society.
3. Students will complete a final lab report to assess general education learning outcomes. This assignment will account for 20% of their total grade

Course Description: A laboratory course designed to introduce the student to the application of the scientific method in solving chemical problems and to acquaint him or her with specific tools and techniques used in the chemistry laboratory, while reinforcing and illustrating concepts encountered in lecture.

This semester of CHEM 112L will include a semester-long research project in which we will investigate the degradation of diphenhydramine (Benadryl) in pills stored under extreme conditions (high heat and humidity). Lab techniques we will learn and use in our research include Thin Layer Chromatography (TLC), UV/Vis spectrophotometry, pH meters, and high performance liquid chromatography (HPLC). Kinetics, buffers, and quantitative solution preparation will all be a part of the research project.

Lab Supplies:
- Lab coat
- Composition book to serve as lab notebook - Your instructor will date and initial your notebook each week before you leave.
- Ballpoint pen, black preferred for all lab notebook recording
- Box of nitrile gloves (at least 50 gloves per box is recommended)

Lab Clean-up: It is your responsibility to clean all glassware you use and leave a clean station. Points will be deducted from your weekly lab assignment(s) if you leave before cleaning. Your instructor or TA will check your station each week.
Deportment: The deportment grade is based on your (1) individual daily conduct, including the way you leave your hood and work area at the end of each lab period and (2) your performance of at least one post-lab clean-up chore, as determined by instructor, daily. If it is reported that the general lab is unfit for use then the students will receive a grade between 50 and 0 zero (as determined by their instructor) for that effort. Otherwise, that portion of the Deportment grade will be 100.

Always remember, Safety First!

If you do not have the appropriate safety gear, you will not be allowed to work in the lab. You will be told to leave. No exceptions.

- You must wear your safety goggles or safety glasses at all times in the lab.
- Long pants are required. You must have full coverage to your shoes.
- Lab coats are required to ensure full coverage and protect your clothes.
- Nitrile gloves must be worn when working with solutions and other reagents.
- Footwear must provide adequate protection to the entire foot. Sandals, open toe shoes, mesh top shoes and shoes with extremely high or narrow heels are inappropriate for the laboratory and will not be permitted. Tops of feet and ankles must be covered.
- You are advised to tie back long hair.
- You are required to watch the lab safety PowerPoint that is presented by your instructor and pass the safety quiz with a minimum grade of 70%.

Attendance Policy: Attendance is mandatory at all laboratory periods. If you must miss your laboratory period, there is no guarantee of attending another laboratory period to make up your missed work. You must contact another laboratory instructor to determine if you may make up the laboratory work in another section. You must inform both your instructor and the makeup instructor by email. If you choose to miss a laboratory period for any unexcused reason, you will receive zero credit for that laboratory period. If you turn in a lab report for a lab you did not attend and/or participate in, you will be reported to the Honor Board.

WA Policy: Labs are experiential learning courses that emphasize the scientific method and data interpretation and they provide training in essential technical skills for chemists and other scientists. Furthermore, the technical lab skills presented in one course are assumed to have been mastered in subsequent chemistry courses. Thus, attendance in all lab periods is crucial. In all cases, if a student misses 3 lab periods without making up the lab in another section, whether these absences are excused or unexcused, that student will receive a WA for a final grade. Students should recognize that it is not always possible to make up work in another section, so students should make every effort to minimize absence from lab.

Disability Services: If you are a student with a documented disability registered with the SNAP office and will require accommodations in this course, please provide the proper documentation in the form of a Professor Notification Letter (PNL) during the first week of class.
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#### Summer 2016

#### Grading Scheme

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Grade Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Notebook</td>
<td>20 %</td>
</tr>
<tr>
<td>Department</td>
<td>5 %</td>
</tr>
<tr>
<td>Assignments and report sheets</td>
<td>50 %</td>
</tr>
<tr>
<td>Final Lab Report</td>
<td>25 %</td>
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</tbody>
</table>

**Lab Notebook:** A laboratory notebook should provide a full record of what was performed during the experiment. Most importantly, all data must be recorded in your lab notebook as soon as it is generated. Your laboratory instructor will check, initial and date your notebook data at the end of each experiment to ensure that everything is properly recorded, including pre-lab information requested at beginning of each experimental procedure. All calculations should be shown in the laboratory notebook such that the instructor may follow your logic and check for calculation errors. Each student is expected to observe the College of Charleston Policy on Scientific Integrity (found in your lab manual).

**Weekly assignments and report sheets:** Assignments will include weekly lab report sheets (found in your lab manual) and some writing assignments.

**Final Lab Report:** The final project will be a lab report describing the research conducted on diphenhydramine pills. See the schedule for the due date of this project. You must submit an electronic copy of your report to your instructor either by e-mail or OAKS, and bring two copies to the final class, one with your name and one without, for peer-review. Failure to bring two printed copies of your final report at the beginning of lab that day will result in a zero for the last lab exercise (peer-review of final reports) as well as a zero on your final report grade.

#### Letter Grades and Percentage Ranges

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>XF</th>
<th>F</th>
<th>D</th>
<th>C-</th>
<th>C</th>
<th>C+</th>
<th>B-</th>
<th>B</th>
<th>B+</th>
<th>A-</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerical grade</td>
<td>Failure due to dishonesty</td>
<td>&lt; 70</td>
<td>70</td>
<td>71-72</td>
<td>73-74</td>
<td>75-79</td>
<td>80-82</td>
<td>83-86</td>
<td>87-89</td>
<td>90-92</td>
<td>93-100</td>
</tr>
</tbody>
</table>
College of Charleston Honor Code and Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student’s actions are related more to a misunderstanding will handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the X to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration--working together without permission--is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance.

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the Student Handbook at: http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php
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**Summer 2016**

<table>
<thead>
<tr>
<th>Expt</th>
<th>Date</th>
<th>Experiments</th>
<th>Sample Pull</th>
<th>Assignment due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7/7</td>
<td>Safety Presentation</td>
<td>3-week</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>7/12</td>
<td>Discuss preparation of tablet samples, plans for sample preparation and data analysis; How to use Web of Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7/13</td>
<td>Thin Layer Chromatography (TLC) of Aspirin, Caffeine, and Acetaminophen</td>
<td>Report Sheet (RS) 3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7/14</td>
<td>Making standard solutions and serial dilutions with quantitative glassware</td>
<td>4-week</td>
<td>RS 4</td>
</tr>
<tr>
<td>5</td>
<td>7/19</td>
<td>Analyzing standard solutions and serial dilutions with UV/Visible Spectrophotometry Using Excel for Lab Data</td>
<td>RS 5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7/20</td>
<td>Making an acetate buffer, pH=4.5</td>
<td>RS 6</td>
<td></td>
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<tr>
<td>7</td>
<td>7/21</td>
<td>How to write a lab report HPLC of aspirin, acetaminophen, and caffeine powder samples</td>
<td>5-week</td>
<td>RS 7 – p 1 &amp; 2</td>
</tr>
<tr>
<td>8</td>
<td>7/26</td>
<td>Peer Review of Introduction Interpretation of aspirin, acetaminophen and caffeine HPLC results</td>
<td>Bring Introduction section (2) RS 8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>7/27</td>
<td>Preparing Exposed Diphenhydramine and Control Samples and conducting HPLC Analysis</td>
<td></td>
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<tr>
<td>9</td>
<td>7/28</td>
<td>Peer Review of Methods and Materials Interpretation of Diphenhydramine HPLC data Individual and group</td>
<td>6-week</td>
<td>Bring Methods and Materials section (2)</td>
</tr>
<tr>
<td>10</td>
<td>8/2</td>
<td>Peer Review of Results and Discussion Pool and Discuss Diphenhydramine Data, all sections Investigating Kinetics of Diphenhydramine Degradation in Pills</td>
<td>Bring Results and Discussion section (2) RS 10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>8/3</td>
<td>FINAL LAB REPORTS DUE AT BEGINNING OF LAB Peer Review of Final Lab Reports</td>
<td>Bring Final Report (2) Peer-Review</td>
<td></td>
</tr>
</tbody>
</table>

Samples were placed in heat/humidity chamber on June 16.  
June 23 – week 1 samples pulled  
June 30 – week 2 samples pulled  
All pulled samples were immediately placed in 5 °C refrigerator in lab 349