Chemistry 112L – Principles of Chemistry Laboratory
Fall 2017
Course Syllabus for all sections

112L Sections, Instructors, Dates, Times, Contact Information

<table>
<thead>
<tr>
<th>Section</th>
<th>Instructor</th>
<th>Date</th>
<th>Time</th>
<th>Contact Information</th>
<th>Office Hours</th>
</tr>
</thead>
</table>
| 1       | Dr. Cory       | W    | 12:15-3:15 pm  | SSMB 314  
coryw@cofc.edu  
843-953-1405          | M 12:00-2:00  
Th 10:15-11:15        |
| 2       | Dr. Forsythe   | W    | 3:30-6:30 pm   | SSMB 112  
forsythejg@cofc.edu  
843-953-5052           | W 9:00-11:00        |
| 3       | Prof. Potter   | W    | 7:15-10:15 pm  | SSMB 124  
cpotter@cofc.edu  
843-953-3618           | By appointment      |
| 4       | Dr. Boussert   | Th   | 12:15-3:15 pm  | SSMB 319  
boussertsm@cofc.edu  
843-953-4965           | By appointment      |
| 5       | Dr. Forsythe   | Th   | 3:30-6:30 pm   | SSMB 112  
forsythejg@cofc.edu  
843-953-5052           | W 9:00-11:00        |
| 6       | Prof. Potter   | Th   | 7:15-10:15 pm  | SSMB 124  
cpotter@cofc.edu  
843-953-3618           | By appointment      |
| 7       | Dr. Gailbreath | F    | 1:00-4:00 pm   | SSMB 114  
gailbreathbd@cofc.edu  
843-953-3093           | By appointment      |

Class Location: SSMB 327 (pre-lab), 323 (lab)

Pre-requisites: CHEM 111, CHEM 111L, MATH 111  
Co-requisite: CHEM 112

Required Materials:
1. CHEM 112L Research Based Laboratory Manual, Version 6
2. Composition book (sewn pages) to serve as lab notebook - Your instructor will date and initial your notebook each week before you leave.
3. Ballpoint pen, black preferred for all lab notebook recording
4. Scientific calculator with logarithmic and exponential functions
5. Box of nitrile gloves (at least 50 gloves per box is recommended) – can be purchased at drug store (ex. CVS, Walgreens). Do not bring polyvinyl or latex gloves.
6. Lab coat – available in C of C bookstore

Course Catalog Description: A laboratory course designed to introduce students to the application of the scientific method in solving chemical problems and to acquaint them with specific tools and techniques used in the chemistry laboratory, while reinforcing and illustrating concepts encountered in lecture. Laboratory three hours per week.
Student Learning Outcomes:
1. Develop an understanding of the scientific method in a chemistry laboratory setting
2. Employ mathematical manipulations using acquired data
3. Interpret scientific data

General Education Student 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.
These outcomes will be assessed in the final lab report and an assessment assignment. This assignment will account for 20% of the total course grade.

Instructional Objectives: This semester of CHEM 112L will include a semester-long research project in which we will investigate the degradation of cetirizine (brand name Zyrtec as well as generic forms) in pills stored under extreme conditions (high heat and humidity). Lab techniques we will learn and use in our research include UV/Vis spectrophotometry, pH measurement, and high performance liquid chromatography (HPLC). Preparation of a buffer and quantitative solutions will be a part of the research project, as well as the use of a sonicator and centrifuge.

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) to your instructor during the first week of class.
**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 be 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 XXF 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 XX 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](http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php)

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**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.

1. You must wear your **safety goggles** or **safety glasses** at all times in the lab.
2. **Long pants** are required. You must have full coverage down to your shoes (wear socks).
3. **Lab coats** are required to ensure full coverage and protect your clothes.
4. **Nitrile gloves** must be worn when working with solutions and other reagents.
5. **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 considered inappropriate for laboratory conditions and will not be permitted. No skin should be visible below the knees.
6. **Socks** are required. If you wear leggings/pants and ankle socks to class, you will be asked to leave until you have socks that cover your ankles. No skin should be visible below the knees.
7. You are advised to tie back **long hair**.
8. 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%.
**Lab Clean-up:** The cleanliness of the lab is related to the safety of the lab. 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.

**Grading Scheme:**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Grade Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Notebook</td>
<td>15 %</td>
</tr>
<tr>
<td>Assignments and report sheets</td>
<td>65 %</td>
</tr>
<tr>
<td>Final Lab Report</td>
<td>20 %</td>
</tr>
</tbody>
</table>

**Lab Notebook:** Each week, the procedure for the experiment to be performed should be written into your lab notebook. Your instructor will discuss this the first day of lab. You may also use drawings to describe what you will be doing in lab if you prefer. You do not need to write instructions for using equipment in your lab notebook (ex. pH meter, Spectrasuite software). This information will be checked before you begin lab and will count as a part of your report grade for the experiment.

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 required pre-lab information due before the pre-lab lecture. 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) and the College of Charleston Honor Code found in this syllabus.

**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 cetirizine pills. With your final lab report, you will turn in a folder containing all drafts of previous graded and peer-reviewed writing assignments. See the schedule for the due date of this project.

**Letter Grades and Percentage Ranges**

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>X XF (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>Below 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>
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Dates are subject to change due to weather or other emergency circumstances.

<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>8/23-8/25</td>
<td>Safety Presentation, safety quiz</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>8/30-9/1</td>
<td>Prepare cetirizine pill samples for storage in environmental chamber</td>
<td>samples into chamber</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>9/6-9/8</td>
<td>How to use Web of Science</td>
<td></td>
<td>Report Sheet (RS) 3</td>
</tr>
<tr>
<td>4</td>
<td>9/13-9/15</td>
<td>Making standard solutions and serial dilutions with quantitative glassware</td>
<td></td>
<td>RS 4</td>
</tr>
<tr>
<td>5</td>
<td>9/20-9/22</td>
<td>Making a 35 mM acetate buffer of pH=4.5</td>
<td></td>
<td>RS 5</td>
</tr>
<tr>
<td>6</td>
<td>9/27-9/29</td>
<td>Balance Exercise - TBA</td>
<td>4-week</td>
<td>RS 6</td>
</tr>
<tr>
<td>7</td>
<td>10/4-10/6</td>
<td>How to write a lab report</td>
<td></td>
<td>RS 7 – p 1 &amp; 2</td>
</tr>
<tr>
<td>8</td>
<td>10/11-10/13</td>
<td>Peer Review of Introduction Interpretation of aspirin, acetaminophen and caffeine HPLC results</td>
<td>6-week</td>
<td>Bring Introduction section – 2 copies, one with name, one without RS 8</td>
</tr>
<tr>
<td>9</td>
<td>10/18-10/20</td>
<td>Preparing exposed cetirizine and control samples and conducting HPLC analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10/25-10/27</td>
<td>Continue preparing exposed cetirizine and control samples and conducting HPLC analysis</td>
<td>8-week</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>11/1-11/3</td>
<td>Peer Review of Methods and Materials Interpretation of cetirizine HPLC data, individual and group</td>
<td></td>
<td>Bring Methods and Materials section – 2 copies (name/no name) RS 10</td>
</tr>
<tr>
<td>12</td>
<td>11/8-11/10</td>
<td>Peer Review of Results and Discussion Pool and discuss cetirizine data, all sections Discuss impact of inactive ingredients, degradation products</td>
<td></td>
<td>Bring Results and Discussion section – 2 copies (name/no name)</td>
</tr>
<tr>
<td>13</td>
<td>11/15-11/17</td>
<td>LAB REPORTS DUE AT BEGINNING OF LAB Peer Review of Lab Reports Evaluations and Surveys</td>
<td></td>
<td>Bring Final Report – 2 printed copies (name/no name)</td>
</tr>
<tr>
<td>14</td>
<td>11/29-12/1</td>
<td>FINAL LAB REPORT DUE</td>
<td></td>
<td>Final Report with peer review feedback incorporated – one printed copy with name, also e-mail pdf copy</td>
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</tbody>
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