I. Locator Information:

Instructor: Dr. Daniel E. Autrey
Course # and Name: CHEM 162 – 02, General Chemistry II Laboratory
Semester Credit Hours: 1.0 credits
Total Contact Hours: 48
Day and Time Class Meets: M 11:00 am – 1:50 pm SciTech 436
Office Location: SciTech 305 B
Office Phone: 910-672-1354
Office Hours: M 10:00 am –10:50 am
W 10:00 am –1:50 pm
R 11:00 am –1:50 pm
Or By Appointment
Email address: dautrey@uncfsu.edu

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Rules and regulations governing the use of FSU email may be found at:

http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf
II. Course Description:

General Chemistry II Laboratory (CHEM 162, 1–0–3) is a continuation of the General Chemistry I Laboratory (CHEM 142) which investigates solution properties, kinetics, chemical equilibria, acid-base equilibria, solubility equilibria, thermodynamics, electrochemistry, and qualitative and elementary quantitative analysis.

Pre-requisites: A grade of "C" in CHEM 142 (General Chemistry I Laboratory) or the equivalent at another university/college.

Co-requisites: CHEM 161 (General Chemistry II)

If a student withdraws from the lecture portion of the course, they must withdraw from the laboratory portion.

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability, please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. Textbook:


V. Student Learning Outcomes:

Upon completion of this course, the students will be able to:

1. Develop good laboratory practice, which include:
   a. Recording experimental observations, and making reasonable conclusions.
   b. Performing the proper proper analytical techniques of titrations and qualitative inorganic analysis.
   c. Applying the standard operating procedures of common laboratory equipment, such as pH meters, spectrophotometers, and centrifuges.
   d. Performing the proper methods of quantitatively measuring and transferring chemicals.
   e. Following safe laboratory procedures.
   f. Developing time management skills.

2. Acquire technical-writing communication skills in expressing scientific principles in words through written laboratory reports.

3. To be able to present and analyze scientific data through graphs and tables.
VI. Course Requirements and Evaluation Criteria:

a. Grading Scale:

I hope that each student experiences an acceptable level of success and accomplishment in this course. This depends not only on academic ability, but also on how much time and commitment a student is willing to invest in the course. Your level of accomplishment in CHEM 162 at the end of the semester is indicated by the grade you receive for the course. The grade you receive will be the grade you earn based on your academic performance. In other words, your grade depends on you and how much quality time you put into the course. Your performance in CHEM 162 is not measured against the performance of other students, but rather against course standards established by the instructor. The course standards upon which grades will be based are listed below.

<table>
<thead>
<tr>
<th>Percentile Points</th>
<th>Letter Grade</th>
<th>Accomplishment Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 - 100%</td>
<td>A</td>
<td>Excellent</td>
</tr>
<tr>
<td>80 - 89.9%</td>
<td>B</td>
<td>Proficient</td>
</tr>
<tr>
<td>70 - 79.9%</td>
<td>C</td>
<td>Acceptable</td>
</tr>
<tr>
<td>60 - 69.9%</td>
<td>D</td>
<td>Poor</td>
</tr>
<tr>
<td>below 59.9%</td>
<td>F</td>
<td>Unacceptable</td>
</tr>
</tbody>
</table>

b. Interim Grades:

Interim grades will be assigned from the first week of the semester until the deadline for class withdrawals. Interim grades are used for informational and warning purposes only; they are not part of your permanent transcript and have no effect on your grade-point average (GPA). In accordance with university policy, the following changes have been implemented:

1. WN (withdrawal due to non-attendance) grades have been discontinued. This means that it is the student’s responsibility to withdrawal from classes prior to the published deadline.
2. Final grade FN (failure due to non-attendance). This final grade is assigned to students who are on a class roster, but who never attend the class. An FN grade is equivalent to an F grade and adversely affects your GPA.
3. Interim Grade X (No-show). This grade is assigned to students who are on a class roster, but who never attend class. If you have an X grade, either begin attending class or withdraw from it. If you do not take action in response to an X grade, you will receive a final grade of FN.
4. Interim Grade EA (Excessive Absences). This grade is assigned to students whose class absences exceed 10% of the total contact hours. If you have an EA grade, you are in jeopardy of failure if you do not take immediate actions. Either resume attending the class or withdraw from it.
c. Attendance Requirements:

*Class attendance is required for all students.* Class absences will be excused only when valid documentation is provided for participation in university sponsored activities, serious illness, and family emergencies. Other absences may be excused at the discretion of the instructor, who may require documentation. The latter may be in the form of a note from a doctor or the university’s student health clinic in the event of serious illness, a note from another Fayetteville State faculty or the athletic department indicating your involvement in an official university-sanctioned event, a bulletin from a funeral service, a note from an employer, etc. In all cases, contact information (i.e., a phone number), must be included. Students must notify the instructor, in advance when possible, of the reasons for the class absence. When prior notification is not possible, students are required to explain the reason for their absence by the next class meeting. When students fail to explain class absences, those absences are unexcused. The university policy concerning absences from class will be strictly enforced. Class attendance is important because of the pace of the course and the abstract nature of many of the topics covered. It is the students’ responsibility to make up any and all missed work. **It is the student’s responsibility to obtain class notes, assignments, and announcements when a lecture is missed.**

**d. Assignments and Point Distribution:**

Final grades will be based on the following point distribution:

<table>
<thead>
<tr>
<th>Type of Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Reports</td>
<td>1000</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>1100</td>
</tr>
</tbody>
</table>

The progress of each student will be evaluated by means of TWELVE laboratory reports (formal and informal), each worth 100 points. The guidelines for formal reports are located in Section X (page 9) of the syllabus. Because there are no make-up laboratory experiments, I will drop the lowest TWO laboratory report grades to account for any excused reason that necessitates why a student would miss the laboratory session. **Under no circumstance will a student be allowed to turn in a laboratory report using data that they did not participate in collecting.** To ensure fairness to all students, each student must obtain the signature of the instructor on their data sheet prior to leaving the laboratory room.

The final grade will include both a final exam worth 100 points. The exam may be written or practical, and will be based on the experiments performed. The final exam will include questions of three types:

a) Questions involving the use of raw data for a hypothetical experiment to obtain final results.

b) Questions about experimental procedures for some of the performed experiments.

c) Questions about major sources of error for some of the performed experiments.
e. Policy on Missed or Late Laboratory / Make-ups Exams:

The following policies have been implemented as a matter of fairness for all students in the course:

Students must attend during their scheduled lab period. There will be NO “makeup” labs or attending a lab at a different time other than scheduled. Students are still responsible for all testing materials that are related to the experiments that they may have missed. Students arriving more than 15 minutes late are counted absent and will not be allowed to enter the lab. The student will lose all credit for the lab.

You are expected to take all quizzes and examinations at the scheduled times. No student will be allowed to take an exam before or following the scheduled exam time. Should an illness, family emergency, official university-sanctioned event or other unavoidable problem necessitate your missing a scheduled exam, you may take a make-up exam provided that (1) the instructor is notified prior to the exam, and (2) you show verifiable evidence for the condition/situation/event that resulted in your missing the regularly scheduled exam. The latter may be in the form of a note from a doctor or the university’s student health clinic in the event of serious illness, a note from another Fayetteville State faculty or the athletic department indicating your involvement in an official university-sanctioned event, a bulletin from a funeral service, a note from an employer, etc. In all cases, contact information (i.e. a phone number) must be included. The make-up exam will be administered at a time agreed upon by both the student and the instructor. Note that makeup exams may be longer, more difficult, and have a different format than the exam given to the class as a whole.

f. Other Student Expectations:

The instructor will respect all students and will make every effort to maintain a classroom climate that promotes learning for all students. Students must accept their responsibility for maintaining a positive classroom environment by abiding by the following rules:

1. Students who are enrolled in General Chemistry II Laboratory (CHEM 162) are expected and presumed to have met the prerequisites for this course.
2. Each student is expected to read the assigned laboratory experiments and do the assigned pre-laboratory exercises prior to coming to the laboratory session. Doing so will give the student a sense of what to expect in the experiment and allow them use the laboratory time efficiently.
3. Students are expected to refrain from disruptive behavior during class. Such behavior is rude and may cause you or those around you to miss an important point or announcement made in class. Participate actively in classroom discussions and activities.
4. Take examinations at the scheduled dates and times.
5. Abide by all laboratory safety practices (including proper dress and wearing approved eye protection).
6. Refrain from participating in all forms of academic misconduct (see below)
g. FSU Policy on Disruptive Behavior in the Classroom:

The Code of the University of North Carolina (of which FSU is a constituent institution) and the FSU Code of Student Conduct affirm that all students have the right to receive instruction without interference from other students who disrupt classes.

FSU Core Curriculum Learning Outcome under Ethics and Civic Engagement (6.03): All students will “prepare themselves for responsible citizenship by fulfilling roles and responsibilities associated with membership in various organizations.” Each classroom is a mini-community. Students learn and demonstrate responsible citizenship by abiding by the rules of classroom behavior and respecting the rights all members of the class.

The FSU Policy on Disruptive Behavior (see FSU website for complete policy) identifies the following behaviors as disruptive:

1. Failure to respect the rights of other students to express their viewpoints by behaviors such as repeatedly interrupting others while they speak, using profanity and/or disrespectful names or labels for others, ridiculing others for their viewpoints, and other similar behaviors;
2. Excessive talking to other students while the faculty member or other students are presenting information or expressing their viewpoints.
3. Use of cell phones and other electronic devices
4. Overt inattentiveness (sleeping, reading newspapers)
5. Eating in class (except as permitted by the faculty member)
6. Threats or statements that jeopardize the safety of the student and others
7. Failure to follow reasonable requests of faculty members
8. Entering class late or leaving class early on regular basis
9. Others as specified by the instructor.

The instructor may take the following actions in response to disruptive behavior. Students should recognize that refusing to comply with reasonable requests from the faculty member is another incidence of disruptive behavior.

1. Direct student to cease disruptive behavior.
2. Direct student to change seating locations.
3. Require student to have individual conference with faculty member. At this meeting the faculty member will explain the consequences of continued disruptive behavior.
4. Dismiss class for the remainder of the period. (Must be reported to department chair.)
5. Lower the student’s final exam by a maximum of one-letter grade.
6. File a complaint with the Dean of Students for more severe disciplinary action.

Students who believe the faculty member has unfairly applied the policy to them may make an appeal with the faculty member’s department chair.
h. Academic Misconduct:

As members of an academic community, each student is expected to preserve his or her personal integrity by refraining from all forms of academic dishonesty. Academic fraud includes, but is not limited to, the following:

1. Copying answers on an exam, quiz, or laboratory assignment from another student.
2. Plagiarism of written work, including laboratory reports, from the textbook, internet webpage, laboratory manual, or other published work.
3. Using notes or a crib sheet on an exam or quiz without the consent of the instructor. This includes writing notes on any part of your body.
4. Asking another student for help or answers during an exam, or providing such help to another student.
5. Having another person take an exam or quiz for you.
6. Stealing or having in one’s possession without permission a copy of an exam or quiz generated by the instructor prior to its administration.

Evidence of cheating, in any form, on an exam or quiz will result in an "F" (0 points) for that quiz or exam. Any student caught cheating more than once could face more severe disciplinary measures, including expulsion from the university, in accordance with university policies as outlined under Disciplinary System and Procedures in the Fayetteville State University Student Handbook. The handbook may be obtained from the Office of Student Affairs located in the Collins Administration Building.

i. Drop Deadline:

No student will be allowed to drop the class after the official university drop deadline listed in the Academic Calendar, 2013-2014, which is Friday March 28th, 2014 for this term. If a student stops attending class after this date, they will receive a final grade of FN (failure due to non-attendance). An FN grade is equivalent to an F grade in the calculation of your grade-point average (GPA). If a student withdraws from the lecture portion of the course, they must withdraw from the laboratory portion.

VII. Academic Support Resources:

The Learning Center in the H. T. Chick building in Room 216 C is available to assist the students with writing, mathematics, and reading comprehension. Also, students are also encouraged to get assistance through the supplemental instructor (SI) assigned for this course.
VIII. Course Outline and Assignment Schedule:

The following is a tentative outline of laboratory experiments that will be performed in CHEM 162 this semester.

**Tentative schedule (subject to change)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Experiment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>13</td>
<td>Check in and Laboratory Safety instructions</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>No Class – Martin Luther King, Jr. Birthday Holiday</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>Experiment 28: Heat of Neutralization (pg. 375 – 388) (formal)</td>
</tr>
<tr>
<td>February</td>
<td>3</td>
<td>Experiment 20: Titrations of Acids and Bases (pg. 251 – 264) (informal)</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Experiment 39: Oxidation-Reduction Titrations II: Analysis of Bleach (pg. 577 – 588) (informal)</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Experiment 19: Colligative Properties: Freezing Point Depression and Molar Mass. (pg. 237 – 250) (formal)</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>Experiment 29: Rates of Chemical Reactions I: A Clock Reaction (pg. 389 – 406) (formal)</td>
</tr>
<tr>
<td>March</td>
<td>3</td>
<td>Experiment 22: Colorimetric Determination of an Equilibrium Constant in Aqueous Solution (pg. 277 – 292) (formal)</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>No Class – Spring Break</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Experiment 25: Determination of the Dissociation Constant of a Weak Acid (pg. 325 – 342) (formal)</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>Experiment 24: Hydrolysis of Salts and pH of Buffer Solutions, Part B (pg. 305 – 324) (informal)</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>Experiment 27: Determination of the Solubility-Product Constant for a Sparingly Soluble Salt (pg. 361 – 374) (formal)</td>
</tr>
<tr>
<td>April</td>
<td>7</td>
<td>Experiment 32: Abbreviated Qualitative Analysis Scheme – Part I, Chemistry of the Group I Cations (pg. 449 – 456) (informal)</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Experiment 32: Abbreviated Qualitative Analysis Scheme – Part IV, Chemistry of the Group IV Cations (pg. 473 – 478) (informal)</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>Experiment 32: Abbreviated Qualitative Analysis Scheme – Part V, Chemistry of Anions (pg. 479 – 490) (informal)</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>Checkout</td>
</tr>
<tr>
<td>May</td>
<td>5</td>
<td>Final Exam</td>
</tr>
</tbody>
</table>
IX. Laboratory Safety Rules:

It is hoped that your laboratory experience will be productive and rewarding, as well as safe. In order to ensure your safety and that of others, there are a number of common laboratory rules to which all students must adhere. While most of these involve simple common sense, please follow these to the letter. The students will NOT be admitted to the lab until they have attended the laboratory safety briefing.

1. Read “Safety in the Laboratory” on pages 5–8 of the Laboratory Textbook. Learn the location of the safety equipment and how to use it. The laboratory is equipped with fume hoods, a fire extinguisher, an eye-wash fountain, and a safety shower.

2. Each student must arrive on time at the start of each experiment and be present when any modifications to procedures are being explained.

3. Come prepared to do your experiment. You will be denied access to the laboratory until you have completed and turned in ‘Review Questions' for the assigned experiment. These have been designed to make sure you have read (and studied) the applicable material before attempting the experiment.

4. Students must wear safety goggles at all times in the laboratory. These lessen chances of eye injury. There will be no exception to this rule.

5. **DO NOT BRING FOOD OR BEVERAGES INTO THE LABORATORY.** Some chemicals are readily absorbed even from the atmosphere by food and/or drink.

6. Keep your work area clean and neat. This is good, standard operating procedure for any laboratory--You avoid contaminating your sample and lessen the possibility of damage to clothing, skin, etc. from chemicals and broken glassware.

7. Do not mix any chemicals without authorization.

8. Conduct your experiment and leave the laboratory. Calculations should not be done in the laboratory.

9. Wash your hands with plenty of water at the end of laboratory session

As of Spring 2011, the Department of Chemistry and Physics will no longer provide students with safety glasses. Fayetteville State University requires students to wear safety glasses while in the laboratory. Safety glasses can be purchased at the FSU Book Store; safety glasses must meet ANSI standards if purchased elsewhere. Glasses are not to be kept in the drawers, and it is the students’ responsibility to bring them to the day of lab.

Laboratory Coordinator: Ivy Rittenhouse
LS 305
Phone: 672-1054
irittenhouse@uncfsu.edu

Instructor: Dr. Daniel E. Autrey
SciTech 305B
Phone: 672-1354
daubrey@uncfsu.edu
X. Laboratory Report Format:

The student will write formal laboratory reports for the experiments conducted throughout the semester. The lab reports will be graded out of 100 total points, and the average of the laboratory grades will be normalized to account for the 100 possible points comprising the laboratory component of the course. For example, if a student has an average laboratory score of 90, they will have 90 (90% x 100) points for their laboratory component.

Lab reports must be typed and include the following sections:
A. Title (original and descriptive of the purpose of the experiment).
B. Abstract (brief paragraph summarizing the experiment performed and highlighting the major results).
C. Introduction (brief description, in your own words, of the lab problem and some background information about the lab contents).
D. Experimental (describes the major procedural steps used in the experiment).
E. Results and Discussion (presents data in tables, shows example calculations, discuss reliability of results and experimental errors).
F. Conclusion (summarizes the results of your work).
G. Post-Lab Questions

NOTE: Assigned Pre-Lab Questions are due before admission to the laboratory. The lab report of the completed experiment from the previous week is also due upon admission to the laboratory.

Late submissions are penalized 10 points per day (40 points maximum per experiment).

XI. Teaching Strategies:

The primary means of instruction for CHEM 162 will be through instructor-led discussions and guided inquiry experimentation.

XII. Bibliography:


XIII. Disclaimer:

To accommodate emergent circumstances, the professor reserves the right to make reasonable changes in the syllabus while the course is in progress. Any understandings between a student and the professor including, but not limited to, changes, expectations, or modifications to course requirements or procedures must be in writing and must be signed by both parties. Any question of interpretation of course requirements or of understandings between a student and the professor will be at the discretion of the professor.