Chemistry 142 Course Syllabus

Course Information
Course: Chemistry 142  
Section: 2456  
Lecture: MWF 8:00-8:50 am  
Lab: TTh 8:00-10:55 pm  
Room 30-222  
Room 30-240

Instructor Information
Instructor: Diana Vance  
E-mail: diana.vance@gcccd.edu  
URLs:  
www.grossmont.edu/dianavance  
https://gcccd.blackboard.com/  
Phone: 619-644-7047  
Office: 30-214  
Office Hours: MWF 9:00-9:50 am  
WF 11:00-11:50 am  
in office or Chemistry computer lab 30-252  
Other times by appointment

General Information
Chemistry 142 is the second semester of the one-year general chemistry course (141-142). The basic principles and calculations of chemistry with emphasis on the areas of thermodynamics, kinetics, aqueous equilibrium, coordination chemistry, nuclear chemistry, and an introduction to organic chemistry will be studied. The laboratory will demonstrate the concepts introduced in lecture and in addition will introduce qualitative analysis. The course consists of three hours of lecture instruction and six hours of laboratory per week. **Attendance at these sessions is required. Plan to spend, on the average, two hours per lecture hour and one hour per lab hour per week additional study time.**

Prerequisites: Grade of “C” or better in Chemistry 141 at Grossmont or equivalent.

*MasteringChemistry* account (available with new books or bought online from publisher)

Optional: Study Guide for above text.

Lab: 142 Laboratory Manual  
Quadrille-ruled, double-entry notebook  
A pen with nonerasable blue or black ink is required for the recording of all laboratory data.  
Safety Glasses (Z-87) - Available in bookstore and hardware stores  
Lock for laboratory drawer - Must be Master Lock (V-69), series recommended by stockroom and sold in the bookstore which comes in a box with a key hole on the back.  
Sharpies  
USB Flash drive

**Additional requirements:** Calculator -- A standard scientific calculator is required for the course.

**Important Information:**
- Last to drop without receiving a “W” Friday, August 28, 2015  
- Last day to apply for CR/NCR Friday, September 18, 2015  
- Last day to drop a class Friday, November 6, 2015  
- Holidays – Monday, September 7; Wednesday, November 11; Thursday-Saturday, November 26-28, 2015  
- Registration should be completed before checking into lab. If registered late, bring your validated receipt to lab. You will be charged for all breakage or loss of laboratory equipment, in addition you will be assessed a $10 minimum fee if you fail to check out of the laboratory before the end of the semester. To make an appointment to check out call the Stockroom at 619-644-7339.  
- Regular attendance is expected (A roll sheet may be passed at each class.). The instructor may drop any student who misses over (4) classes. (BUT this is not a guarantee!) If you wish to drop, you should turn in the forms and get a receipt.
• Visit me during my office hours the first week of class for five bonus points on your first exam.
• Those enrolled at the end of the semester must receive a letter grade unless they have chosen the CR/NC option. An “incomplete” may be arranged for completion of a particular item such as the final exam, but will not be given to allow a repeat of the course. Withdrawal or CR/NC grading is available through admissions and records.
• All course assignments must be turned in no later than the start of the final examination in order to be considered for credit. No late laboratory assignments will be accepted.
• The use of videotape or other recording devices is only permitted with the express written consent of the instructor.

Student Learning Outcomes:
This course is both a lecture and a laboratory course. The major goals for the semester are to become fluent in the language of chemistry and to utilize the tools of chemistry to analyze a variety of chemical phenomena. The behavior of materials will be explored in the laboratory and use your knowledge of chemistry to explain the behavior. In particular, each student should be able to do the following upon completion of this course:
  a. Demonstrate a working knowledge of the language of chemistry.
  b. Apply quantitative reasoning to chemical problems
  c. Apply a laws and theories to explain and predict the properties of atoms and molecules.
  d. Employ laboratory equipment and techniques to collect, organize and evaluate experimental data.

Course Objectives:
The student should be able to:
  1. Analyze kinetic data for reaction order, and write the rate law for chemical reactions based on experimental data.
  2. Demonstrate an understanding of the relationship of reaction rates to temperature, concentration, and activation energy.
  3. Explain the relationship between reaction mechanism and rate law.
  4. Perform calculations involving equilibria of weak acids, weak bases and buffers.
  5. Solve solution inventory problems for slightly soluble slats and complex ions.
  6. Analyze titration curves of weak, strong, and polyprotic acids and bases to determine concentrations and equilibrium constant values.
  7. Calculate the Gibbs free energy for reactions and interpret the relationship between entropy, enthalpy, temperature and spontaneity.
  8. Relate free energy to equilibrium constants.
 10. Be able to calculate cell potentials to cells under nonstandard conditions.
 11. Solve quantitative electrochemical problems.
 12. Identify the components of an electrolytic or galvanic cell.
 13. Explain colors of transition metal compounds in terms of ligand field theory.
 14. Classify substances on the basis of their chemical reactivity.
 15. Describe different types of isomerism in organic and inorganic compounds.
 16. Analyze and balance nuclear equations.
 17. Demonstrate an understanding of the concepts of fission, fusion, transmutation and natural radioactive decay.
 18. Classify organic compounds on the basis of structure and functional group.
 19. Name and draw structures for the major classes of organic compounds.
 20. Demonstrate proficiency in qualitative inorganic analytical techniques, computer data acquisition and analysis.
Grading Criteria:

<table>
<thead>
<tr>
<th></th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>variable</td>
</tr>
<tr>
<td>Exams</td>
<td>100 points each</td>
</tr>
<tr>
<td>Assignments</td>
<td>variable</td>
</tr>
<tr>
<td>Laboratory</td>
<td>variable</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200 points</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

- **Quizzes** – There will be a quiz every week that an exam is not scheduled. It is very important for you to stay current and seek assistance when it is needed. Quizzes will be given in lab. There will be 9 - 12 quizzes given over the course of the semester and 1 or 2 may be dropped at the instructor’s discretion. Material from both laboratory and lecture may be included. Much of the material on the quizzes will be similar to the material found in the assignments. No make-ups are given for missed quizzes. Missed quizzes will count for zero points and be counted as low scores when dropping quizzes.

- **Exams** -- There will be four exams and one final exam during the semester. The four exams will be given as per the schedule. The final is comprehensive and will be given during our scheduled time during finals week. Please do not miss these examinations. **Make-up exams will only be given with an acceptable and verifiable excuse within one week of the scheduled exam.** It is the student’s responsibility to arrange a make-up exam within one week of the original test date. Please notify the instructor before the missed exam or within two school days preferably via email, so that accommodations can be made. Please note that make-up exams may not be the same exam given to the rest of the class and may be more difficult than the regularly scheduled exam.

- **Assignments --** These include computer exercises and homework.
  - Computer exercises – These are computer graded tutorials that are available via the internet (see below).
  - Homework assignments - Problems and questions from the textbook and/or on www.masteringchemistry.com

- **Laboratory Work --** Your laboratory work must be done and completed during your regularly scheduled time and the reports must be turned in to pass the course. The laboratory portion of the grade will depend on experimental technique, lab etiquette, and the lab reports. Lab reports are due one week after the period in which they are scheduled to be completed. Guidelines for the format for writing up lab reports can be found on the course website. To receive credit for formal lab reports, they must be submitted to SafeAssign on Blackboard to check for plagiarism by the due date and time.

**Academic Integrity Policy:**

This class will be conducted in accordance with the college student code of conduct and basic standards of academic honesty. Cheating and plagiarism (using one's own ideas, writings, materials, or images of someone else without acknowledgement or permission, or other forms of academic dishonesty) can result in any one of a variety of sanctions. Such penalties may range from an adjusted grade on the particular exam, paper, project, or assignment (all of which may lead to a failing grade in the course) to, under certain conditions, suspension or expulsion from a class, program or the college. Examples include, but are not limited to, using unauthorized materials copying or allowing another student to copy your work during an exam, quiz, or homework assignment, using a programmable calculator, cell phone, or PDA during an exam or quiz. The instructor may also summarily suspend the student for the class meeting when the infraction occurs, as well as the following class meeting. For further clarification and information on these issues, please consult with your instructor or contact the office of the Associate Dean of Student Affairs. Violations will be reported to the school dean for appropriate action.

The faculty and the college have determined that integrity and honesty are essential to the academic process and that it is necessary that the written materials submitted by each student in a class reflect his or her own work for that class.

Submitting work as one’s own which has been done either all or part by another is defined as CHEATING. **“CHEATING” includes but is not limited to the following:**

1. The possession or use of unauthorized materials such as crib notes or unauthorized copies of exam material.
2. Copying from another person’s quiz or exam or allowing another person to copy one’s examination material.
3. Copying another person’s lab data or report and turning it in as one’s own or allowing another person to copy one’s data.
4. Using a calculator or computer which contains stored information that can be used while taking a quiz or exam.
5. The possession and/or use at the students work area of a personal communications device during exams or quizzes.
6. Submitting a false report for work that was not actually done.
7. Modifying or attempting to modify an answer on an exam after it has been returned and then claiming it was graded incorrectly.

We hope that each student will support this policy and realize the importance of honesty and integrity in his or her academic effort!

**Accommodations for Students with Disabilities:**
Students with disabilities who may need accommodations in this class are encouraged to notify the instructor and contact Disabled Student Services & Programs (DSP&S) **early in the semester** so that reasonable accommodations may be implemented as soon as possible. Students may contact DSP&S in person in room 60-120 or by phone at (619) 644-7112 (voice) or (619) 644-7119 (TTY for deaf).

**Computer Course Materials:**
The computer materials for this class are accessed via the World Wide Web. Many of these materials can be accessed at [www.grossmont.edu/dianavance](http://www.grossmont.edu/dianavance) Online computer homework can be accessed at [https://gcccd.blackboard.com/](https://gcccd.blackboard.com/)

**Additional Chemistry Assistance:**
There is a free tutoring service in the library building, and chemistry instructors/tutors are available to all students during “open” help times in the chemistry computer room (30-252). The schedule is posted on the door.

**I reserve the right to make changes to the syllabus and schedule as I or the class see fit.**
<table>
<thead>
<tr>
<th>Week</th>
<th>Chapter and Topic</th>
<th>Experiment</th>
</tr>
</thead>
<tbody>
<tr>
<td>08-17-15</td>
<td>Ch 13 – Kinetics</td>
<td>Check-in; Lab lecture Exp 1 – Kinetics of the Dissociation of H₂O₂ Exp 1 – cont. Kinetics of H₂O₂</td>
</tr>
<tr>
<td>08-24-15</td>
<td>Ch 13 – continued August 28th: Last day to drop without a W</td>
<td>Exp 2 – Oxidation of an Alcohol</td>
</tr>
<tr>
<td>08-30-15</td>
<td>Ch 14 – Equilibrium – a review Ch 15 – Eq in the Aqueous Phase</td>
<td>Exp 3 – Determining K_a</td>
</tr>
<tr>
<td>09-07-15</td>
<td>Holiday – Monday, Sept. 7th Ch 15 – continued Ch 16 – Aqueous Ionic Equilibrium</td>
<td>Exp 4 – pH indicators Problem Session</td>
</tr>
<tr>
<td>09-14-15</td>
<td>Ch 16 – continued</td>
<td>Exam I Exp 5 – Titration Curves</td>
</tr>
<tr>
<td>09-21-15</td>
<td>Ch 16 – continued</td>
<td>Exp 5 – cont. Titration Curves Exp 7 – Solubility Product</td>
</tr>
<tr>
<td>10-12-15</td>
<td>Ch 17 – continued Ch 18 – Electrochemistry</td>
<td>Exp 10 – Group II Cations Problem Session</td>
</tr>
<tr>
<td>10-26-15</td>
<td>Ch 24 – Transition Metals and Coordination Compounds</td>
<td>Exp 17 – Electrochemistry (B) Exp 19 – Ligand Substitution</td>
</tr>
<tr>
<td>11-09-15</td>
<td>Holiday – Wednesday, Nov. 11th Ch 24 – continued Ch 19 – Radioactivity and Nuclear Chemistry</td>
<td>Problem Session  Exam III</td>
</tr>
<tr>
<td>11-16-15</td>
<td>Ch 19 – continued</td>
<td>Exp 20 – Radioactive Decay Exp 14 – General Qual</td>
</tr>
<tr>
<td>11-30-15</td>
<td>Ch 20 – continued</td>
<td>Lecture Catch-Up, Problem Session, and Check Out ☺</td>
</tr>
<tr>
<td>12-07-15</td>
<td>Problem Session Finals Week starts Tuesday, December 8th</td>
<td>Exam IV</td>
</tr>
<tr>
<td>12-14-15</td>
<td>Cumulative General Chemistry Final Exam</td>
<td>Monday, December 14, 2014 7:15-9:15 am</td>
</tr>
</tbody>
</table>