CHEM 114: General Chemistry II (3 Hours) 

South Dakota School of Mines and Technology

Chemistry/Chemistry Engineering Building, Room C228

Time: MWF: 8:00-8:50 AM

(Subject to modification)

INSTRUCTOR: Justin P. Meyer  
Office: Chemistry and Chemical Engineering 122
Phone: 394-2431
Email: Justin.Meyer@sdsmt.edu

Office Hours: Monday, Wednesday, Friday 9:00 to 11:00 am, or by appointment

Course Description: An introduction to the basic principles of chemistry for students needing an extensive background in chemistry. A continuation of CHEM 112.

Course Prerequisites: CHEM 112 and MATH 102.

Instructional Methods: The course will be taught primarily using power point lectures. Access to the power points for the course can be found on the course web site on D2L, and it is recommended that students have these available during lectures in either paper or electronic form. Evaluation will be done primarily electronically through D2L through the use of tablet PC’s.

REQUIRED TEXT AND EQUIPMENT:
   To purchase:  
2. Scientific Calculator. (Cell phones may not be used for this purpose)
3. Tablet PC.

COURSE WEB SITE: Course materials and grades will be posted to the course web site at: 
https://d2l.sdbor.edu/index.asp

If you can’t access this site you need to contact your instructor as soon as possible. Also remember that the grades posted to this web site are not the ‘final’ grades. Grades from the instructor’s grade book are the final grades, and those are posted to the web site with the best accuracy possible. That being said, if you see a grade that doesn’t appear correct on D2L, you should contact the instructor to verify the grade.

COURSE POLICIES:
Attendance: Attendance at lectures is expected.
Assessment/Grading: Your grade for the course will be based on a total possible score of 700 points, calculated as follows:

- Quizzes/Homework 100 points
- Four Hour Exams Scores: 400 points (100 points each)
- Final Exam Score: 200 points

Total: 700 points

A: 90%  B: 80%  C: 70%
D: 60%  F: <60%

These levels may change, but they will not increase.
Hour Exams: Four ~1 hour exams will be given during this course each scaled to 100 points for a total of 400 possible points. Exams will be given electronically using D2L. For this you will need to have the lockdown browser downloaded, which will be covered the first day of class. If you show up to an exam without knowing how to access the needed material to take the exam the instructor will not have time to inform you on how to do this, and your grade will be taken at the end of the exam whether complete or not. For exams, you need to bring your tablet PC with a fully charged battery. Make up exams will not be given. If you know you will be missing an exam you need to contact your instructor prior to the exam to schedule a time to take the exam.

Final Exam: The final exam for the course (200 possible points towards course grade) will be comprehensive and will be given on Monday, May 4th at 9:00 am. If you must miss the final exam for an excusable reason (e.g., illness requiring medical treatment, death in immediate family) the instructor will schedule a make-up final exam prior to the scheduled final exam time.

Quizzes/Homework: Quizzes will be given frequently. Two quiz scores can be dropped during the period of the course. Quizzes missed for any reason can not be made up and will be given a grade of zero. You will also be given homework assignments that will be completed electronically on Wiley Plus, these scores cannot be dropped. Make sure to check Wiley Plus for deadlines for homework assignments. The average of a student’s quiz scores and homework scores will be given a percentage and that will be converted to points toward your final grade (90% \(\rightarrow\) 90 points).

Course Objective: Students will obtain a foundation in the fundamental principles and models of chemistry necessary for an understanding of the composition, structure, and properties of matter and the changes that matter undergoes.

Course Outcomes:

- Understand rates of reaction and conditions affecting rates.
- Derive the rate equation, rate constant, and reaction order from experimental data.
- Use integrated rate laws.
- Understand the collision theory of reaction rates and the role of activation energy.
- Understand the nature and characteristics of chemical equilibria.
- Understand the significance of the equilibrium constant, K.
- Understand how to use the equilibrium constant in quantitative studies of chemical equilibria.
- Understand and use Le Châtelier’s Principle in predicting the effects of stresses on equilibrium systems.
- Use the Bronsted-Lowry and Lewis concepts of acids and bases.
- Apply the principles of chemical equilibrium to acids and bases in aqueous solution.
- Understand the control of pH in aqueous solutions with buffers.
- Evaluate the pH in the course of acid-base titrations.
- Apply chemical equilibrium concepts to the solubility of ionic compounds.
- Understand the concept of entropy and how it relates to spontaneity.
- Use tables of data in thermodynamic calculations.
- Define and use free energy in predicting the spontaneity of chemical processes.
- Balance net ionic equations for oxidation-reduction reactions.
- Understand the principles of voltaic and electrolytic cells.
- Understand how to use electrochemical potentials.

Incomplete Grades (INC): According to University policy, the grade of INC may be assigned at the discretion of the instructor when a student, for good reason (e.g., serious health problems) has not
completed a portion of the work for the course while the rest of the work for the course has been satisfactorily completed. Therefore, except for extenuating circumstances, a grade of incomplete will only be assigned to students who are earning a grade of C or better. When the incomplete is granted, the instructor will stipulate what work is required to complete the course and a deadline for completion of that work; grades for all of the student’s work completed before assignment of the incomplete, in combination with the work completed after the assignment of the incomplete will be used to complete the final grade for the course.

**ADA Statement:** Students with special needs or requiring special accommodations should contact the instructor, (Justin Meyer at 394-2431) and/or the campus ADA coordinator, Jolie McCoy, at 394-1924 at the earliest opportunity.

**Freedom in learning.** Under Board of Regents and University policy student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Students who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should contact dean of the college which offers the class to initiate a review of the evaluation.

**Electronic Devices Policy:** Please turn off your cell phone before class starts. No text messaging in class. No headphones. Note that according to “Policy Governing Academic Integrity” in the SDSM&T Undergraduate Catalog, the instructor of record for this course has discretion of how acts of academic dishonesty are penalized, subject to the appeal process, and that “Penalties may range from requiring the student to repeat the work in question to failure in the course” (72-73). No other use of any other electronic/computer media is allowed during class time.

**My version of Electronic Devices Policy:** Please turn off your cell phone before class starts. No text messaging in class. No headphones. If you wish to use a laptop in this class for purposes of note taking, that’s great, but if you are caught playing games or browsing ‘noneducational’ web sites you will be asked to leave, with multiple violations resulting in dropping of a letter grade for the course. You will not be able to use a cell phone for a calculator on exams and quizzes. During the class lecture I am requesting that you have your screens locked in the down position if you prefer to use your tablet during class.

**Academic Honesty:** We will not tolerate any cheating as defined by the student code of conduct ([http://sdmines.sdsmt.edu/sdsmt/studentconduct/main](http://sdmines.sdsmt.edu/sdsmt/studentconduct/main)). Cases of cheating will be handled on a case to case basis as defined in the student code of conduct. From my experience, the use of technology in evaluations can make it very tempting to use various methods to cheat. Keep in mind that with this technology comes more freedom, but there are also ways to monitor one’s activities, and you will be caught.
TENTATIVE LECTURE AND EXAM SCHEDULE
*EXAM DATES ARE SUBJECT TO CHANGE!*  

<table>
<thead>
<tr>
<th>Chapter(s)</th>
<th>Exams</th>
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<tbody>
<tr>
<td>13-14</td>
<td>Exam 1: Friday, Feb 6th</td>
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<tr>
<td>15,16,17</td>
<td>Exam 2: Friday, March 6th</td>
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<tr>
<td>18,19</td>
<td>Exam 3: Friday, April 8th</td>
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<tr>
<td>20,21,22</td>
<td>Exam 4: Wednesday, April 29th</td>
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<td></td>
<td>Final Exam (9:00 am)</td>
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* Approximate schedule of chapters covered in that exam

**Studying Hints:** I will be lecturing using power point slides. After we cover a few sections I give a brief review of important concepts and some practice problems. I will also give quizzes frequently. I will also be posting practice sets of problems for each chapter. Between the quizzes and the practice problems you will have a good selection of problems to study for an exam. Problems similar to these, along with the concepts, will be included on exams for the most part. REALIZE THAT EXAMS MAY HAVE SOME QUESTIONS THAT ARE NOT SIMILAR TO HOMEWORK PROBLEMS OR QUIZ PROBLEMS. Make sure to know the concepts as well as the problems. Other hints are:

- Use your text book (online site)
- Take your own notes from the textbook, separate from the lecture notes.
- If you have questions, get them answered as soon as possible. Make sure to review questions you got wrong on quizzes or exams.
- Study groups.
- Check D2L for answers to quizzes, exams, and other notices.
- Review your quizzes; you don’t want to miss the same question twice.
- Do the homework.