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 WebCT, and it is recommended that student have these available during lectures in either paper or electronic form. Evaluation will be done primarily electronically through the use of tablet PC’s or laptop computers.

**REQUIRED TEXT AND EQUIPMENT:**  
**Text:** Chemistry, 9th ed, Raymond Chang, McGraw Hill 2007  
**ISBN:** 0073221031  
**Other:** Tablet PC or Laptop

**Optional Text:**  
**ISBN:** 0072980613

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

**Total:** 700 points

**A:** 90% (630 or more points)  
**B:** 80% (560-629 points)  
**C:** 70% (490-559 points)  
**D:** 60% (420-489 points)  
**F:** <60% (<420 points)
**Hour Exams:** Four ~1 hour exams will be given during this course each worth 100 points for a total of 400 possible points. **For exams, you should 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 Friday May 9th at 7:00 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, each worth ~10 points. The average of a students quiz scores will be given a percentage and that will be converted to points (90% → 90 points). Three 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 may also be given a few 5-10 point homework assignments that will be completed online, these score can not be dropped.

**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 Brønsted-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
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. If you wish to use a laptop in this class for purposes of note taking, that’s great; however, you will be required to download DyKnow software and then join CHEM114 to activate. Any attempt to circumvent the DyKnow monitoring system will be considered a form of cheating and a breach of academic integrity. 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. Electronic devises may be distracting to others, so please be aware of this. You will not be able to use a cell phone for a calculator on exams and quizzes. I will be monitoring your computers during the course using DyKnow, so you must sign up for the Chem 114 class on DyKnow before you can take an exam. If you need to download DyKnow to your laptop you should see tablet central in the basement of the library for instructions on how to do so.

Academic Honesty: We will not tolerate any cheating as defined by the student code of conduct (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.
**TENTATIVE LECTURE AND EXAM SCHEDULE**

*EXAM DATES ARE SUBJECT TO CHANGE!*

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<thead>
<tr>
<th>Week</th>
<th>Chapter(s) *</th>
<th>Exams</th>
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<tbody>
<tr>
<td>Jan. 18th</td>
<td>13</td>
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<tr>
<td>Jan. 23rd and 25th</td>
<td>13</td>
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<td>Jan. 28th - Feb. 1st</td>
<td>13-14</td>
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<tr>
<td>Feb. 4th - 8th</td>
<td>14</td>
<td>Exam 1: Friday, Feb 8th</td>
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<td>Feb. 11th-15th</td>
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<td>Feb. 20th, 22nd</td>
<td>15-16</td>
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<td>Feb 25th-29th</td>
<td>16</td>
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<td>Mar. 3rd-7th</td>
<td>17</td>
<td>Exam 2: Friday, March 7th</td>
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<td>Mar. 10th-14th</td>
<td>18</td>
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<td>Mar. 17th-21st</td>
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<td>No Class Spring Break</td>
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<td>Mar. 26th, 28th</td>
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<td>Mar. 31st-Apr. 4th</td>
<td>19</td>
<td>Exam 3: Friday, April 4th</td>
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<td>Apr. 7th-11th</td>
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<td>Apr. 14th-18th</td>
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<td>Apr. 21st-25th</td>
<td>23,24</td>
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<td>Apr. 28th-May 2nd</td>
<td>24</td>
<td>Exam 4: Wednesday, April 30th</td>
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<td>May 9th</td>
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<td>Final Exam (7:00 am)</td>
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* Approximate schedule of chapters covered in lecture during a given week.

**Studying Hints:** I will be lecturing using power points. 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 set 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 PRACTICE 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, separate from the lecture notes.
- If you have questions, get them answered as soon as possible.
- Study groups.
- Check WebCT for answers to practice problems, and other notices.
- Review your quizzes; you don’t want to miss the same question twice.
- Do the practice problems.

**TEACHING IS NOT AN EXACT SCIENCE, IF YOU HAVE QUESTIONS OR COMMENTS, PLEASE PROVIDE INPUT.**