

**CHEM 114: General Chemistry II (3 Hours)****FALL 2009***South Dakota School of Mines and Technology**Chemistry/Chemistry Engineering Building, Room C228**Time: MWF: 12:00-12:50 PM***(Subject to modification)****INSTRUCTOR:** Justin P. Meyer

Office: Chemistry and Chemical Engineering 122

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**Office Hours:** MWF 1:00-2:30 PM**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 internet quizzing as well as paper exams. Homework will be given using the WileyPlus internet site.**REQUIRED TEXT AND EQUIPMENT:**

1. Brady, Senese; "Chemistry: Matter and Its Changes", Fifth edition, Wiley text with enrollment in WileyPLUS with CATALYST.

To purchase:

[http://www.sdsmtbookstore.com/buy\\_book\\_detail.asp?mscssid=40F0B6E8B5D74A27AA6256BFBE4B67DE&pf\\_id=10152928](http://www.sdsmtbookstore.com/buy_book_detail.asp?mscssid=40F0B6E8B5D74A27AA6256BFBE4B67DE&pf_id=10152928)

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. The quiz tool on D2L will also be utilized for evaluation purposes in class. Also remember that the grades posted to this web site are not the 'final' grades but are meant to serve as information for the student. Grades from the instructor's grade book are the final grades. 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 550 points, calculated as follows:

Quizzes	50 points
Homework	50 points
Six Hour Exams Scores:	300 points (50 points each)
Final Exam Score:	<u>150 points</u>

**Total: 550 points****A: 90%      B: 80%      C: 70%      D: 60%      F: <60%***These levels may change, but they will not increase.*

**Hour Exams:** Six 1 hour exams will be given during this course each scaled to 50 points for a total of 300 possible points. Exams will be given using scan forms. **For exams, you need to bring your own calculator and a pencil. 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. If participation in a school-sponsored activity requires you to be absent on the day an exam is scheduled, you are required to take the exam prior to leaving on the activity. Arrangements to do so must be made with me, in person, a minimum of one week in advance of the exam date.

**Final Exam:** The final exam for the course (150 possible points towards course grade) will be comprehensive and will be given on Friday, December 18<sup>th</sup> at 10:00 am. It will be a comprehensive exam with a portion of new material. 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:** Quizzes will be given frequently. Three quiz scores can be dropped during the period of the course. **Quizzes missed for any reason cannot be made up and will be given a grade of zero.**

The average of a student's quiz scores will be given a percentage and that will be converted to points toward your final grade out of 50 points (example: 90% → 45 points).

**Homework:** You will also be given frequent homework assignments that will be completed electronically on WileyPlus. These homework scores cannot be dropped. It is your responsibility to check WileyPlus for assignments and announcements pertaining to class. Homework not completed by the due date will not receive a score.

The average of a student's homework scores will be given a percentage and that will be converted to points toward your final grade out of 50 points (example: 90% → 45 points).

**Course Objectives:** 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.
- Be able to predict oxidation numbers and coordination numbers of complex ions.
- Be able to calculate energies of nuclear reactions.
- Be able to balance nuclear equations.
- Be able to predict methods of nuclear decay.
- Be able to identify functional groups.
- Be able to use basic organic nomenclature.

**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.

Tablets or laptops are going to be used for the class. If a student chooses to use their own laptop and not be part of the tablet program it is **their responsibility** to make sure that their computer can access the internet in the classroom and have any programs needed installed on their computer. The instructor will not provide any tech support or give exceptions for computer problems for those that are not part of the tablet program.

**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. 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!**

<b>Exam</b>	<b>Chapter(s) *</b>	<b>Exams</b>
Exam 1	13	Wednesday, September 16 <sup>th</sup>
Exam 2	14,15	Friday, October 2 <sup>nd</sup>
Exam 3	16,17	Monday, October 19 <sup>th</sup>
Exam 4	18	Friday, October 30 <sup>th</sup>
Exam 5	19	Monday, November 9 <sup>th</sup>
Exam 6	20	Monday, November 23 <sup>rd</sup>
Final Exam	13-22	Friday, December 18 <sup>th</sup> (10:00am)

\* Approximate schedule of chapters covered in that exam