CHEM 112 General Chemistry I Lecture  
Spring 2015

Course Syllabus and Expectations

Instructor
Dr. Michael Dianovsky
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Email: Michael.Dianovsky@sdstate.edu

Course Meetings
This course is scheduled to meet each Monday, Wednesday, and Friday from 9:00 AM to 9:50 AM in Rotunda D.

Office Hours
You are always welcome to come to my office without an appointment during my scheduled office hours: **M, W, F: 10:00-11:30 am.** If these times do not work for you, please see me or email me and we can set up an alternative time.

Course Description
An introduction to the basic principles of chemistry for students needing an extensive background in chemistry (including science majors and pre-professional students). Completion of a high school course in chemistry is recommended.

Course Prerequisites
MATH 102 and CHEM 112L are co-requisites. It is expected that the student has had a thorough year-long course of chemistry in high school.

Course Goals
The course and its co-requisite (Chem 112L) meet South Dakota Board of Regents General Education Goal 3: Natural Science (System Goal #6). Students will understand the fundamental principles of the natural sciences and apply scientific methods of inquiry to investigate the natural world.

Student Learning Outcomes
As a result of taking courses meeting this goal, students will satisfy the following learning outcomes: A) Identify and explain the basic concepts, terminology and theories of selected natural science and B) Apply selected natural science concepts and theories to contemporary issues.

Instructional Methods
The course material will be presented primarily using a standard lecture format and may also include at various times demonstrations, in-class questions, group problems, group discussions, and student initiated discussions.

Required Textbook
Attendance Policy
Attendance at all lectures is expected. To obtain the maximum benefit from educational opportunities, students must establish habits of regular class attendance. Students are expected to attend all classes. Excessive absences may result in not meeting the course objectives and a failing grade.

Lateness
This class starts exactly at 9:00 A.M. Prompt and regular attendance is expected. It is your responsibility to know all material presented in class. I will not have time to re-teach any of the material you miss due to being late.

Behavior during Lectures
Students are expected to refrain from any activity that may be considered a distraction to others in the class, and to treat others with respect. Please no cell phone usage in class. If you have a cell phone on you, it must either be OFF or in silent or vibrate mode. During exams or quizzes, it must be OFF.

General Information
Students are expected to read completely and carefully any reading materials associated with that week’s lecture. Exams require college level reading and writing skills. Communication skills are required to facilitate classroom discussions and question asking. Unless stated otherwise, work and/or reasoning must be shown and legible to receive credit. You can receive most of the points on a calculation problem if you set it up correctly, but make a careless arithmetic error, but will receive ZERO points for a “coincidentally” correct (or unsupported) numerical answer. This applies to non-numerical problems also (logic/reasoning needed).

Required Calculator
You will need a calculator for this class. Scientific calculators are allowed. Phones are not acceptable.
**CHEM 112 General Chemistry I Lecture Course Numerical Grade and Evaluation Procedure**

Final grades will be assigned using a final average based on the ranges listed below. Typically this class will be curved. The curve will be applied at the end of the semester. These are rough estimates.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 – 90 %</td>
<td>A</td>
</tr>
<tr>
<td>89 – 80 %</td>
<td>B</td>
</tr>
<tr>
<td>79 – 70 %</td>
<td>C</td>
</tr>
<tr>
<td>60 – 69%</td>
<td>D</td>
</tr>
<tr>
<td>Below 60%</td>
<td>F</td>
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</tbody>
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**Grading**

*Based on the following*

- Reflections
- Homework
- Quizzes
- Exams
- Final Exam

<table>
<thead>
<tr>
<th></th>
<th>Point Breakdown</th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflections</td>
<td>13 @ 7.70 pts</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Homework</td>
<td>100 pts</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10 @ 25</td>
<td>250</td>
<td>25%</td>
</tr>
<tr>
<td>Exams</td>
<td>3 @ 100 pts</td>
<td>300</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td></td>
<td>250</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>1000</td>
<td>100%</td>
</tr>
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**In-Class Exams** (These dates are subject to change):

*First Exam* Chapters 6 and 7; **Monday, February 2, 2015**

*Second Exam* Chapters 8 and 9; **Monday, March 2, 2015**

*Third Exam* Chapters 10, 11 and 13; **Friday, April 10, 2014**

The exams will focus on material discussed during the lectures and in the assigned reading. Exams will contain both multiple and show your work questions. All exams must be taken as scheduled. If a student misses an exam due to a University approved trip or verified illness, and can produce verifiable documentation for the absence, a make-up exam will be given. If a student misses an exam for any other reason, or cannot produce verifiable documentation for the absence, the format of the make-up exam will be at the discretion of the instructor. If a student does not notify the instructor that they missed an exam or quiz within 48 hours, after the scheduled time, the student will receive a zero for the missed exam or quiz.

**Reflections**

Throughout the semester you will be asked to complete a form in which you reflect on your current understanding of specific chemistry concepts. This is graded as complete/incomplete. There will be approximately 10 reflections you will make during the course of the semester. This will help you plan, monitor, and evaluate your understanding. I will also read them to get a better understanding of where student understanding is on a variety of the topics we are going to cover. We will also have discussions about promoting problem solving and critical thinking skills during lecture. **No late reflections will be accepted.**
**Homework**
Homework will be assigned for every chapter. This will be completed on D2L. The homework for each chapter will be posted online the day the chapter is started in lecture. You will 3 attempts to complete each homework assignment. **No late homework will be accepted.**

**Quizzes**
Quizzes (~12 in total throughout the semester) will be announced a week before they are due on D2L and a few unannounced quizzes during lecture. All quizzes must be completed on D2L before the assigned deadline. You will have only one chance to complete the quiz. Please do not complete the quiz last minute in case there are issues with the D2L server. A missed quiz is graded as a zero. **There are no make-ups allowed for missed quizzes, regardless of the reason for a missed quiz.**

**Final Exam**
The final exam will be a comprehensive exam that covers Chapters 5-11, 13, and 19. The date of the final exam is May 8th from 9:15 – 11:15 AM. **There are no make-up final exams, regardless of the reason for a missed exam.**

**Student Resources**
Students can receive additional help: during office hours and help sessions (announced during lecture), in the Chemistry Resource Room, SAV 246/247, from the Supplemental Instruction (SI) program ([http://www.sdstate.edu/index/si.cfm](http://www.sdstate.edu/index/si.cfm)), and from Wintrode Tutoring ([http://www.sdstate.edu/gs.students.tutoring/index.cfm](http://www.sdstate.edu/gs.students.tutoring/index.cfm)). All of these resources are free.

**Academic Integrity Policy**
All work submitted is to be the effort of the individual. No aids may be used during the examinations unless approved by the instructor. If you are not sure what is allowed, it is your responsibility to ask the instructor. You are never allowed to use anything Xeroxed or printed from a computer during the exam unless provided by the instructor for that purpose. Anyone participating in an act of dishonesty will receive a failing grade for the course and may be referred through appropriate university procedures for further disciplinary action.

**Accommodations**
Any student who feels s/he may need an accommodations based on the impact of a disability should contact Nancy Hartenhoff-Crooks (or successor) Coordinator of Disability Services (650-688-4504 or Fax, 605-688-4987) to privately discuss your specific needs. The Office of Disability Services is located in room 065, the University Student Union.

**Board of Regents Statement on Freedom in Learning**
Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any courses of study. Students who believe that an academic evaluation is unrelated to academic standards but is related instead to judgment of their personal opinion or conduct should first contact the instructor of the course. If the student remains unsatisfied, the student may contact the Depart Head, Dean, or both, of the college which offers the class to initiate a review of the evaluation.
*** CHEM 112 Spring 2015 Student Learning Objectives ***

**Chapter 5: Thermochemistry**
Energy, First law of Thermodynamics, Enthalpy, Calorimetry, Hess’s Law, Enthalpies of Formation

**Chapter 6: Electronic Structure of Atoms**
Wave nature of light, Quantized energy and photons, Line spectra, Bohr Model, Quantum mechanics, Atomic Orbitals, Electron Configurations

**Chapter 7: Periodic Properties of the Elements**
Development of the periodic table, Size of Atoms and Ions, Ionization Energy, Electron Affinity

**Chapter 8: Basic Concepts of Chemical Bonding**
Lewis symbols and the octet rule, ionic bonding, covalent bonding, bond polarity, electronegativity, resonance structures, exceptions to the octet rule

**Chapter 9: Molecular Geometry and Bonding Theories**
Molecular shapes, VSEPR Model, Hybrid orbitals, molecular orbitals, diatomic molecules

**Chapter 10: Gases**
Characteristics of Gases, pressure, gas laws, ideal gas law, gas mixtures, partial pressures, kinetic-molecular theory, effusion, diffusion, real gases

**Chapter 11: Liquids and Intermolecular Forces**
Intermolecular forces, properties of liquids, phase changes, vapor pressure, phase diagrams.

**Chapter 13: Properties of Solutions**
Solution process, saturated solutions, solubility, factors affecting solubility, solution concentration, colligative properties.

**Chapter 19: Chemical Thermodynamics**
Spontaneous processes, entropy, 2nd Law of Thermodynamics, 3rd Law of Thermodynamics, Gibbs Free Energy
## TENTATIVE SCHEDULE

<table>
<thead>
<tr>
<th>Dates</th>
<th>Monday</th>
<th>Wednesday</th>
<th>Friday</th>
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<tbody>
<tr>
<td>January 12-16</td>
<td>Introduction</td>
<td>Chapter 6</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>January 19-23</td>
<td>NO CLASS</td>
<td>Chapter 6</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>January 26-30</td>
<td>Chapter 6</td>
<td>Chapter 7</td>
<td>Chapter 7</td>
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<tr>
<td>February 2-6</td>
<td>EXAM 1</td>
<td>Chapter 8</td>
<td>Chapter 8</td>
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<tr>
<td>February 9-13</td>
<td>Chapter 8</td>
<td>Chapter 8</td>
<td>Chapter 8</td>
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<tr>
<td>February 16-20</td>
<td>NO CLASS</td>
<td>Chapter 9</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>February 23-27</td>
<td>Chapter 9</td>
<td>Chapter 9</td>
<td>Chapter 9</td>
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<tr>
<td>March 2-6</td>
<td>EXAM 2</td>
<td>Chapter 11</td>
<td>Chapter 11</td>
</tr>
<tr>
<td>March 9-13</td>
<td></td>
<td></td>
<td><strong>SLEEP BREAK</strong></td>
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<tr>
<td>March 16-20</td>
<td>Chapter 11</td>
<td>Chapter 11</td>
<td>Chapter 11/13</td>
</tr>
<tr>
<td>March 23-27</td>
<td>Chapter 13</td>
<td>Chapter 13</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>March 30-April 3</td>
<td>Chapter 10</td>
<td>Chapter 10</td>
<td><strong>NO CLASS</strong></td>
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<tr>
<td>April 6-10</td>
<td>Chapter 10</td>
<td>Chapter 10</td>
<td><strong>EXAM 3</strong></td>
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<tr>
<td>April 13-17</td>
<td>Chapter 5</td>
<td>Chapter 5</td>
<td>Chapter 5</td>
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<tr>
<td>April 20-24</td>
<td>Chapter 5/19</td>
<td>Chapter 19</td>
<td>Chapter 19</td>
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<tr>
<td>April 27-30</td>
<td>Chapter 19</td>
<td>Chapter 19</td>
<td>Chapter 19</td>
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<tr>
<td>Friday May 8th</td>
<td></td>
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<td>Final Exam 9:15-11:15</td>
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Information distributed during lectures that deviates from this syllabus, takes precedence over this syllabus. Obtaining information presented during lectures that a student misses, is the student’s responsibility.