Syllabus — CHEM 1411 General Chemistry — Fall 2018

FACULTY INFORMATION

- **Dr. Kyle Beran**
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  Phone: 486-6663
  E-mail: Kyle.Beran@angelo.edu
  Office Hours: MWF 2-3, TR 11-12, or by appointment

- **Mr. Kevin Boudreaux**
  Office: CAV 207B
  Phone: 486-6623
  E-mail: Kevin.Boudreaux@angelo.edu
  Office Hours: MWF 10-11, TR 11-12, or by appointment; Review sessions W 5 pm

- **Dr. David Carter**
  Office: CAV 218
  Phone: 486-6626
  E-mail: David.Carter@angelo.edu
  Office Hours: M 1:30-3 pm; W 8-9:30, R 9:30-11:30 or by appointment

- **Dr. Edith Osborne**
  Office: CAV 204A
  Phone: 486-6629
  E-mail: Edith.Osborne@angelo.edu
  Office Hours: MWRF 11-12, M 1-2

- **Dr. Gregory Smith**
  Office: CAV 207A
  Phone: 486-6628
  E-mail: Gregory.Smith@angelo.edu
  Office Hours: M-F 9 – 10

- **Dr. Ralph Zehnder**
  Office: CAV 204B
  Phone: 486-6662
  E-mail: Ralph.Zehnder@angelo.edu
  Office Hours: W 2:30-5, F 11-1:30, or by appointment; Review sessions W 5 pm

CHEM 1411 LECTURE CLASSES

Lecture Class Schedule

<table>
<thead>
<tr>
<th>Sec</th>
<th>Days</th>
<th>Time</th>
<th>Instructor</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>MWF</td>
<td>09:00 am-09:50 am</td>
<td>Dr. Beran</td>
<td>CAV 211</td>
</tr>
<tr>
<td>030</td>
<td>MWF</td>
<td>10:00 am-10:50 am</td>
<td>Dr. Beran</td>
<td>CAV 211</td>
</tr>
</tbody>
</table>

Required Supplies

- **Textbook and SmartWork online homework [Both Required]:**
Purchasing Options:
1. Textbook (printed) + eBook + SmartWork
2. eBook + SmartWork
3. SmartWork only (only if you get a textbook from another source that does not include SmartWork.)
Options 1 and 2 are available from the ASU Bookstore or directly from the publisher at the Norton website.1
Option 3 is only available from the publisher.

- **Carbon Copy Lab Notebook [Required]:** (available from the ASU Bookstore or from the lab stockroom)
- **Approved Lab Goggles [Required]:** (available from the ASU Bookstore or from the lab stockroom)
- **Calculator [Required]:** Scientific calculator capable of performing calculations with scientific notation and logarithms. *Bring your calculator to class and to lab every day. Only non-programmable calculators may be used on the exams.*

Course Description
In this class, you will study the fundamental laws and theories of chemistry, chemical nomenclature, chemical equilibrium, metals and non-metals and their compounds, nuclear chemistry and the quantum theory of structure. **Prerequisites:** Chemistry 1411 is to be completed before Chemistry 1412. Proficiency in algebra required. Only students eligible to take college-level mathematics courses may take Chemistry 1411.

Grading

<table>
<thead>
<tr>
<th>Category</th>
<th>Points Possible</th>
<th>Grade</th>
<th>Percent</th>
<th>Points Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (3×100 pts)</td>
<td>300 pts</td>
<td>A</td>
<td>90-100%</td>
<td>900-1000 pts</td>
</tr>
<tr>
<td>Final</td>
<td>150 pts</td>
<td>B</td>
<td>80-89.9%</td>
<td>800-899 pts</td>
</tr>
<tr>
<td>Quizzes / Class Participation</td>
<td>150 pts</td>
<td>C</td>
<td>70-79.9%</td>
<td>700-799 pts</td>
</tr>
<tr>
<td>SmartWork Homework</td>
<td>200 pts</td>
<td>D</td>
<td>60-69.9%</td>
<td>600-699 pts</td>
</tr>
<tr>
<td>Laboratory</td>
<td>200 pts</td>
<td>F</td>
<td>&lt;60%</td>
<td>0-599 pts</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1000 pts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Exams
The exams will be given outside of regular class time on the dates listed in the table below:

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
<th>Room</th>
<th>Time</th>
<th>Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>Thursday, September 27</td>
<td>CAV 100</td>
<td>5:30 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Thursday, October 25</td>
<td>CAV 100</td>
<td>5:30 pm</td>
<td>100 pts</td>
</tr>
<tr>
<td>Exam 3</td>
<td>Thursday, November 29</td>
<td>CAV 100</td>
<td>5:30 pm</td>
<td>100 pts</td>
</tr>
</tbody>
</table>

Most of the exams will be over material covered since the last exam. However, the course builds on material delivered earlier so the concepts, calculations, and techniques from earlier
exams may be required. Only non-programmable calculators may be used on the exams (i.e., no graphic calculators are allowed).

Make up exams will be at the discretion of your individual faculty. Usually, allowances will only be made in the case of an excused university absence. Communication with your instructor is critical.

Final Exam Schedule
The Final Exam will be a comprehensive multiple-choice standardized exam published by the American Chemical Society (ACS). Study guides for the ACS exam (“General Chemistry - Official Study Guide”) are available for sale in the lab stockroom and from the ACS web page. The schedule for Dr. Beran’s CHEM 1411 final exams is shown below. The complete final exam schedule is also available on the ASU web page.

<table>
<thead>
<tr>
<th>Sec</th>
<th>Days</th>
<th>Time</th>
<th>Instructor</th>
<th>Final Exam Date</th>
<th>Final Exam Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>MWF</td>
<td>09:00 am-09:50 am</td>
<td>Dr. Beran</td>
<td>Wednesday, Dec. 12</td>
<td>8:00 am-10:00 am</td>
</tr>
<tr>
<td>030</td>
<td>MWF</td>
<td>10:00 am-10:50 am</td>
<td>Dr. Beran</td>
<td>Monday, Dec. 10</td>
<td>10:30 am-12:30 pm</td>
</tr>
</tbody>
</table>

SmartWork Computer Homework
SmartWork is an online homework program which accompanies the Gilbert textbook. These assignments will be averaged to give a 200-point grade. To register with SmartWork, follow the instructions in the “Smartwork Student Registration” handout.

Blackboard
Grades will be posted on Blackboard. Information, handouts, homework assignments, and other course documents will either be posted on your instructor’s faculty web page, or on Blackboard.

Attendance
You are expected to attend all class meetings. You are expected to arrive on time and to stay until the end of the lecture. In-classroom activities such as worksheets and quizzes cannot be made up. You will not be automatically dropped if you stop attending class.

If you have the flu or are sick, please stay home. Do not help spread illnesses to everyone else. Keep your professor informed as to your status by email (preferred) or telephone (if necessary). Your faculty will work with you to keep up to date in the class.

Drop Dates
The last day to drop not create an academic record Wednesday, September 12, 2017. The last day to drop with a grade of “W” is Thursday, November 1, 2017.

Honor Code / Academic Dishonesty
Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding the Academic Honor Code, which is to be found in the Student Handbook. The penalty for ANY sort of dishonesty, cheating or plagiarism can range from a grade of zero on the assignment to a F in the course and disciplinary action as warranted in accordance with university guidelines. Don’t even consider it.
Disabilities
Persons with disabilities which may warrant academic accommodations must contact the Student Life Office, Room 112 University Center, in order to request and to implement academic accommodations. Or contact Ms. Dallas A. Swafford, Director of Student Disability Services, at (325)942-2047 or dallas.swafford@angelo.edu.

Title IX
Angelo State University is committed to the safety and security of all students. If you or someone you know experience sexual harassment, sexual assault, domestic or dating violence, stalking, or discrimination, you may contact ASU’s Title IX Coordinator: Michelle N. Boone, J.D., Director of Title IX Compliance, (325)486-6357 or michelle.boone@angelo.edu.

Student Absence for Observance of Religious Holy Days
A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information.

Incomplete Grade Policy
It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information.

General Policies Related to this Course
All students are required to follow the policies and procedures presented in these documents. Angelo State University Student Handbook and Angelo State University Catalog.

CHEM 1411 LAB CLASSES
The lab classes that accompany the CHEM 1411 lecture course are shown in the table below. The labs will generally meet for pre-lab lectures in the Class Room listed in the table.

<table>
<thead>
<tr>
<th>Section</th>
<th>Day</th>
<th>Meeting Time</th>
<th>Instructor</th>
<th>Lab Room</th>
<th>Class Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>08Z</td>
<td>M</td>
<td>11:00 am-01:50 pm</td>
<td>Dr. Zehnder</td>
<td>CAV 215</td>
<td>CAV 216</td>
</tr>
<tr>
<td>09Z</td>
<td>M</td>
<td>02:00 pm-04:50 pm</td>
<td>Dr. Osborne</td>
<td>CAV 215</td>
<td>CAV 216</td>
</tr>
<tr>
<td>10Z</td>
<td>M</td>
<td>02:00 pm-04:50 pm</td>
<td>Dr. Smith</td>
<td>CAV 211</td>
<td>CAV 212</td>
</tr>
<tr>
<td>11Z</td>
<td>T</td>
<td>11:00 am-01:50 pm</td>
<td>Dr. Carter</td>
<td>CAV 211</td>
<td>CAV 212</td>
</tr>
<tr>
<td>12Z</td>
<td>T</td>
<td>11:00 am-01:50 pm</td>
<td>Dr. Osborne</td>
<td>CAV 215</td>
<td>CAV 216</td>
</tr>
<tr>
<td>13Z</td>
<td>T</td>
<td>02:00 pm-04:50 pm</td>
<td>Dr. Osborne</td>
<td>CAV 215</td>
<td>CAV 216</td>
</tr>
<tr>
<td>14Z</td>
<td>W</td>
<td>11:00 am-01:50 pm</td>
<td>Dr. Smith</td>
<td>CAV 215</td>
<td>CAV 216</td>
</tr>
<tr>
<td>15Z</td>
<td>W</td>
<td>02:00 pm-04:50 pm</td>
<td>Dr. Zehnder</td>
<td>CAV 211</td>
<td>CAV 212</td>
</tr>
<tr>
<td>16Z</td>
<td>W</td>
<td>02:00 pm-04:50 pm</td>
<td>Dr. Carter</td>
<td>CAV 215</td>
<td>CAV 216</td>
</tr>
<tr>
<td>17Z</td>
<td>R</td>
<td>11:00 am-01:50 pm</td>
<td>Dr. Zehnder</td>
<td>CAV 211</td>
<td>CAV 212</td>
</tr>
</tbody>
</table>
Lab Course
The CHEM 1411 General Chemistry laboratory class accompanies this lecture class. The lab is designed to illustrate some of the principles involved in performing scientific measurements, handling chemicals, and performing chemistry experiments. In some cases, the experiments in the lab will introduce you to concepts before you cover them in the lecture course, and in some cases, the experiments will reinforce concepts already covered in the lecture course.

Labs will begin meeting on the first day of class. Bring your calculator!

Laboratory Attire
Beginning on the first day of lab, everyone MUST have approved goggles, long-sleeved shirts which cover the midriff, long pants, and shoes with closed toes and heels (no sandals, slides, etc.). (Basically, you should have as little exposed skin as possible.) Anyone not wearing the appropriate attire will not be allowed into lab.

Lab Manual and Lab Reports
The lab manual provides a description of the background for each experiment, pre-laboratory questions that will be turned in at the beginning of the lab period, a procedure for the experiment, and a lab report form which must be handed in when the lab is completed. It is essential that you read the appropriate section in the lab manual before coming to class.

You will also need to record data in a lab notebook, and hand in the carbon copies from that notebook when the lab is complete. The lab notebook should include an abstract for the experiment, a short summary of the procedure for the lab, all of the data collected during the lab and any observations that are made, and a conclusion for the lab.

The grade for each lab will come from the lab report, the pre-lab questions, and the carbon copy pages from the lab notebook. Each lab will be worth 100 points.

Cleaning Up After Lab
Make sure that your lab area is clean and that all glassware and hardware has been cleaned and returned to the appropriate drawers before leaving the lab.

Make-Up Lab Policy
The lowest lab score will be dropped from the total. If you miss a lab for a valid reason, that is the score that will be dropped.

Lab Safety Training
All students enrolled in lab courses are required to take a Mandatory Laboratory Safety Training and Quiz on Blackboard. Instructions for completing the quiz are given below:

1. Login to Blackboard and choose the course: entitled “Lab Safety Training.”
2. Under the left-hand menu, choose: “Get Started Here”.
3. There are three sections:
   a. Welcome to Lab Safety Training — These are your instructions.
   b. Lab safety training — Click on “Lab Safety - Click here to begin”. This will download a PowerPoint slide show which will cover the safety training.
   c. The lab safety quiz. You must score 90% or higher. You can take it again in 24 hours.

The Lab Safety Training must be completed by the evening of Sunday, September 9.
**Lab Quizzes and Final**
A mid-term laboratory exam will be given during the week of October 29 and a lab final given during the last week of classes (both worth 100 points. These grades will *not* be dropped from the total.
<table>
<thead>
<tr>
<th>Day</th>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/27</td>
<td>Chapter 1: Matter and Energy — Composition of Matter, States of Matter, Measurements, SI Units, Significant Figures, Unit Conversions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Significant Figures and Dimensional Analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experiment 1: The Determination of Mass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mandatory Lab Safety Training and Quiz — instructions given in Lab Safety Training section (must be completed by Sep. 10)</td>
</tr>
<tr>
<td>2</td>
<td>9/03</td>
<td>Monday, Sep 3 Labor Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chapter 2: Atoms, Ions, and Molecules — Nuclear Model, Atomic Mass, Periodic Table, Molecular and Ionic Compounds, Naming Compounds and Writing Formulas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Labs Do Not Meet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Take Home Assignment: “Scientific Measurement and Presentation of Data” must be completed before start of lab next week</td>
</tr>
<tr>
<td>3</td>
<td>9/10</td>
<td>Chapter 2, cont.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experiment 3: The Use of Volumetric Glassware</td>
</tr>
<tr>
<td>4</td>
<td>9/17</td>
<td>Chapter 3: Stoichiometry — The Mole Concept, Balancing Equations, Stoichiometry, Percent Composition, Limiting Reactants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experiment 4: Density Determinations</td>
</tr>
<tr>
<td>5</td>
<td>9/24</td>
<td>Chapter 3, cont.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exam 1 – Thurs., Sep. 27 (Ch. 1, 2,3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experiment 11: Percentage Water in a Hydrate</td>
</tr>
<tr>
<td>6</td>
<td>10/01</td>
<td>Chapter 4: Solution Chemistry — Concentration, Electrolytes, Acid-Base Reactions, Precipitation Reactions, Redox Reactions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Percentage of Potassium Chlorate in a Mixture (procedure available on Blackboard)</td>
</tr>
<tr>
<td>7</td>
<td>10/08</td>
<td>Chapter 4, cont.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experiment 12: Titration of Vinegar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experiment 5: Specific Heat Capacity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exam 2 – Thurs., Oct. 25 (Ch. 3, 4,5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experiment 7: Heats of Reaction: Hess’s Law</td>
</tr>
<tr>
<td>Day</td>
<td>Date</td>
<td>Lecture</td>
</tr>
<tr>
<td>------</td>
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<td>---------------------------------------------------</td>
</tr>
</tbody>
</table>
| 10   | 10/29    | Chapter 6, cont.  
*Fri., Nov. 3 Last Day to Drop*               | Mid-Term Exam (Through Expt. #5)  
Experiment 10: Preparation and Properties of Hydrogen and Oxygen Gases (Demo) |
| 12   | 11/12    | Chapter 8: Chemical Bonds — Lewis Structures, Covalent Bond, Polar Bonds, Resonance, Exceptions to the Octet Rule | Experiment 2: The Emission Spectra of Atoms                           |
| 13   | 11/19    | Chapter 9: Molecular Geometry — VSEPR, Valence Bond Theory, MO Theory  
*Wed., Nov. 21 Holiday*  
*Thurs, Nov. 22 Thanksgiving*  
*Fri, Nov. 23 Holiday*       | No Labs                                                              |
| 14   | 11/26    | Chapter 9, cont.  
*Exam 3 – Thurs., Nov. 29 (Ch. 7, 8, 9)*       | Experiment 6: Molecular Structures and Shapes                        |
| 15   | 12/03    | Chapter 10: Intermolecular Forces — Intermolecular Forces, Vapor Pressure, Phase Diagrams, Water | Lab Final                                                            |
|      | 12/10    | Final Exams                                       |                                                                      |

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Quizzes / Class Participation
Quizzes will be administered at the beginning of class throughout the semester on a weekly basis. They will be based on material presented since the previous lectures will be taken primarily from the problems in the textbook. There will be approximately 12 to 15 quizzes, worth 20 points each; the lowest two quiz grades will be dropped from the total; and the remaining quiz grades will be averaged together on a 100-point scale. NO MAKEUP QUIZZES WILL BE GIVEN.

The other 50 points on the “Quizzes / Classroom Participation” score are based on attendance in class. Two points will be taken off the 50-point Classroom Participation grade for each class missed.

Studying and Homework
The lectures will follow the general format for the textbook; it is expected that you will read the appropriate sections in the textbook. In general, for any college-level class, you should be prepared to spend about 2-3 hours of studying for each hour of lecture.

In order to master chemistry, you MUST “DO CHEMISTRY”. This textbook has a good selection of problems within each chapter and at the end of each chapter. You should make an effort to work all of the problems within the text of the chapter; in addition, I will highlight some selected problems from the end of the chapter that you should try to work. You can expect to see a lot of these (or at least similar ones) on the exams.

Review Sessions and Supplemental Instruction
Review sessions will be held on a regular basis, approximately every two weeks, on Thursday at 5:00 PM (location to be announced later). During these sessions, I will address any questions that you may have regarding chemical concepts and / or problems. These sessions are NOT prepared lectures. Therefore, you must come prepared (No questions = No review session). These sessions should give you a chance to enhance your understanding of chemistry, and hence, your grade.

For this course, a Supplemental Instruction tutoring program may be available. A schedule of SI sessions, or other tutoring information, will be announced when it is available.
STUDENT LEARNING OUTCOMES

- **Learning Goal 1**: Students will be able to analyze complex chemical problems and draw logical conclusions.
  - Students will be able to use an understanding of atomic structure at the basic and atomic levels to analyze the structure and reactivity of substances and chemical species.
  - Students will be able to use an understanding of how energy interacts with matter to predict stable chemical species, and perform thermodynamic calculations describing chemical reactions.

- **Learning Goal 2a**: Students will be able to understand and apply scientific reasoning in the chemical sciences.
  - Students will be able to use an understanding of ions and molecules at the atomic level to predict the behavior of reactions in aqueous solutions.
  - Students will be able to use the basic ideas of quantum mechanics to describe how molecular bonds form and to predict molecular shape and polarity. Molecular structure and polarity will be used to predict the forces between molecules and relate those forces to the states of matter and phase changes.

- **Learning Goal 2b**: Students will be able to employ mathematics in the analysis of chemical problems.
  - The mole concept, chemical formulas and balanced chemical equations will be used to do chemical calculations that relate macroscopic measurements to numbers of atoms, ions or molecules.
  - Students will be able to do calculations involving solution concentration and know how to prepare solutions of given concentrations.
  - Students will be able to quantitatively predict gas properties using gas law calculations.

- **Learning Goal 3**: Students will be able to demonstrate technical and analytical skills in chemistry.
  - Students will be able to use the periodic table to determine basic atomic information and to predict trends in atomic properties.
  - Students will be able to interconvert between chemical names and formulas to the extent that they can work problems given only one of those pieces of information.
  - Students will be able to classify common types of chemical reactions and predict the outcomes of reactions.

**Evaluation of Student Learning Outcomes**
Student learning outcomes will be evaluated by test questions or by the grading of in-classroom activities, as described by your instructor.

**Texas Higher Education Coordinating Board Natural Sciences Objectives**
The objective of the study of a natural sciences component of a core curriculum is to enable the student to understand, construct, and evaluate relationships in the natural sciences, and to enable the student to understand the basis for building and testing theories.

**Exemplary Educational Objectives**
1. To understand and apply method and appropriate technology to the study of natural sciences.
2. To recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing.
3. To identify and recognize the differences among competing scientific theories.
4. To demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies.
5. To demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture.

1 http://books.wwnorton.com/books/index.aspx
2 http://uwm.edu/acs-exams/students/student-study-materials/
3 http://www.angelo.edu/services/registrar办公室/final.html
4 www.wwnorton.com/smartwork
5 http://blackboard.angelo.edu (或 access Blackboard from RamPort)
6 www.angelo.edu/cstudent/
7 http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of
8 http://www.angelo.edu/content/files/14197-op-1011-grading-procedures
9 https://www.angelo.edu/student-handbook/
10 https://www.angelo.edu/catalogs/