Instructors:

Mr. Kevin Boudreaux
  Email: Kevin.Boudreaux@angelo.edu
  Phone: 486-6623
  Office: CAV 207B
  Office Hours: MWF 9:30-11, TR 8:30-9:30, or by appointment; Review sessions W 5 pm

Mr. Rigel Rilling
  Email: Rigel.Rilling@angelo.edu
  Phone: 486-6654
  Office: CAV 201B
  Office Hours: MW 2:00-5:00 pm, T 11:00 am-2:00 pm.

Dr. Edith Osborne
  Email: Edith.Osborne@angelo.edu
  Phone: 486-6629
  Office: CAV 218
  Office Hours: MWF 11:00 – 11:50, T 10:00 – 11:00, or by appointment

Dr. Gregory Smith
  Email: Gregory.Smith@angelo.edu
  Phone: 486-6628
  Office: CAV 207A
  Office Hours: MTWR 1:00 – 2:00, or by appointment

Dr. Ralph Zehnder
  Email: Ralph.Zehnder@angelo.edu
  Phone: 486-6662
  Office: CAV 204B
  Office Hours: Office Hours: M 11:00 - 1:30, W 11:00-12:30, F 11-12:00, or by appointment. Also available for virtual office meetings.
CHEM 1312 — GENERAL CHEMISTRY CLASS MEETINGS

Class Meeting Times

<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>TR</td>
<td>09:30 am-10:45 am</td>
<td>Mr. Boudreaux</td>
<td>CAV 211</td>
</tr>
<tr>
<td>020</td>
<td>MWF</td>
<td>10:00 am-10:50 am</td>
<td>Dr. Smith</td>
<td>CAV 223</td>
</tr>
<tr>
<td>030</td>
<td>MWF</td>
<td>10:00 am-10:50 am</td>
<td>Dr. Zehnder</td>
<td>CAV 200</td>
</tr>
<tr>
<td>040</td>
<td>TR</td>
<td>09:30 am-10:45 am</td>
<td>Dr. Zehnder</td>
<td>CAV 219</td>
</tr>
</tbody>
</table>

Required Texts and Materials

- **Textbook, ALEKS online homework, and TopHat Pro online student engagement platform [all three required]:**
  

  Purchasing Options:
  1. Textbook – FREE!
  2. ALEKS – McGraw-Hill; [https://www.aleks.com](https://www.aleks.com)

- **Respondus Lockdown & Respondus Monitor** Access through Blackboard. Make sure that your computer/laptop is compatible with Respondus software. Respondus Monitor requires a webcam. Lockdown and Monitor will be used for the administration of exams.

- **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 during the exams.*

Course Description

**1312/CHEM 1312 General Chemistry II (3-0).** This course, which is a continuation of CHEM 1311, focuses on intermolecular forces, chemical kinetics, chemical equilibrium, acid-base chemistry, thermodynamics, and electrochemistry. Additional topics, such as environmental chemistry, coordination chemistry, nuclear chemistry, and/or polymers may be introduced.

**Prerequisites:** Chemistry 1311 is to be completed with a grade of C or better before Chemistry 1312. Proficiency in algebra required. Only students eligible to take college-level mathematics courses may take Chemistry 1312.

**Corequisite:** Chemistry 1112.
1112/CHEM 1112 General Chemistry II Laboratory (0-3). Laboratory experiments that focus on laboratory technique, data collection, and analysis. The experiments will expand upon the concepts and topics presented in Chemistry 1312. **Corequisite:** Chemistry 1312.

**Technology Requirements**
To successfully complete this course, students need to obtain access to ALEKS, an online homework program. These assignments will be averaged to give a 200-point grade. To register with ALEKS, log into BlackBoard and click on the ALEKS link on the upper left. Then follow the instructions given.

**TopHat student and classroom engagement platform [Required]**
We will be using TopHat, which is an interactive system that will allow students to use their cell-phones, and/or tablets, and/or laptops to answer questions/quizzes instantly in class and at home. To get started and for more information please go to this link and create an account unless you have already a TopHat Account at ASU: [https://tophat.com](https://tophat.com)
Please see the information under the TopHat link in BlackBoard for your specific section.

**Respondus Lockdown Browser**
Access to exams and quizzes will be through Respondus Lockdown Browser and will be video recorded via Respondus Monitor. Respondus requires a desktop computer or laptop (not a Chromebook) and a webcam. For best results, use an ethernet cable to connect to your Internet source instead of relying on Wifi. Refer to the Blackboard course for Respondus installation instructions. Click here for more information: [https://www.youtube.com/watch?time_continue=9&v=XuX8WoeAycs&feature=emb_title](https://www.youtube.com/watch?time_continue=9&v=XuX8WoeAycs&feature=emb_title)

**Course Delivery**
To maintain academic quality while accommodating social distancing needs this semester, this course will use a split delivery model that combines face-to-face teaching with remote instruction.
The goal is to provide face-to-face instruction to students who want to come to campus, while also allowing students who may need to learn remotely to participate via virtual class sessions.
How Does It Work?
Your class will be divided and you will be placed into a smaller group of students to maintain physical distancing requirements in our assigned classroom space. Your assigned group will receive a schedule of in-person class meetings. This schedule is not flexible. For instance, if you are supposed to attend class on a Monday, you cannot elect to go on Wednesday with another class group instead. When you are not in the physical class, you will attend live remote sessions at the same time as our scheduled course. You will also be expected to complete coursework via Blackboard¹. Please refer to this Health and Safety web page for updated information about campus guidelines as they relate to the COVID-19 pandemic.

Attendance
You are expected to attend all class meetings according to the schedule of physical and virtual attendance as explained above. You are expected to arrive on time and to stay until the end of the lecture. Activities such as worksheets and quizzes cannot be made up. You will not be automatically dropped if you stop attending class.

If you feel sick, please stay home. 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.

Grading

Evaluation and Grades
Course grades will be determined as indicated in the table below.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (3×100 pts)</td>
<td>300 pts</td>
</tr>
<tr>
<td>Final Exam</td>
<td>150 pts</td>
</tr>
<tr>
<td>Quizzes, classroom participation</td>
<td>150 pts</td>
</tr>
<tr>
<td>ALEKS Homework</td>
<td>200 pts</td>
</tr>
<tr>
<td>Laboratory</td>
<td>200 pts</td>
</tr>
<tr>
<td>Total</td>
<td>1000 pts</td>
</tr>
</tbody>
</table>

Students who are taking both CHEM 1112 and CHEM 1312 for the first time who wish to drop either course must drop both courses, because dropping either course would result in the co-requisite requirement no longer being met.
Overall grades in CHEM 1312/1112 will be determined as follows:

- If BOTH CHEM 1312 and CHEM 1112 are completed, the letter graded will be based on a total of 1000 points.
- For students who begin and complete ONLY CHEM 1312, a percentage will be calculated using only lecture assessments (first four items listed above with 800 points possible) and the letter grade will be assigned based on that percentage.
- For students who begin and complete ONLY CHEM 1112, the percentage will be calculated using only lab assessments and that percentage will be used to assign a letter grade.

**Grading System**

Course grades will be dependent upon completing course requirements and meeting the student learning outcomes.

The following grading scale will be used for this course:

- **A** = 900-1000 points (90-100%)
- **B** = 800-899 points (80-89.9%)
- **C** = 700-799 points (70-79.9%)
- **D** = 600-699 points (60-69.9%)
- **F** = 0-599 points (<60%)

**Exams**

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

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
<th>Room</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>Thursday, February 25</td>
<td>virtual</td>
<td>5:30 pm</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Thursday, March 25</td>
<td>virtual</td>
<td>5:30 pm</td>
</tr>
<tr>
<td>Exam 3</td>
<td>Thursday, April 22</td>
<td>virtual</td>
<td>5:30 pm</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
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 the 1312 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>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>TR</td>
<td>09:30-10:45 am</td>
<td>Mr. Boudreaux</td>
<td>Thurs., May 13</td>
<td>08:00-10:00 am</td>
</tr>
<tr>
<td>020</td>
<td>MWF</td>
<td>10:00-10:50 am</td>
<td>Dr. Smith</td>
<td>Mon., May 10</td>
<td>10:30 am-12:30 pm</td>
</tr>
<tr>
<td>030</td>
<td>MWF</td>
<td>10:00-10:50 am</td>
<td>Dr. Zehnder</td>
<td>Mon., May 10</td>
<td>10:30 am-12:30 pm</td>
</tr>
<tr>
<td>040</td>
<td>TR</td>
<td>09:30-10:45 am</td>
<td>Dr. Zehnder</td>
<td>Thurs., May 13</td>
<td>08:00-10:00 am</td>
</tr>
</tbody>
</table>

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.

Last Day to Drop
The last day to drop the course with a grade of “W” is Friday, April 30, 2021.
# CLASS SCHEDULE — Spring, 2021

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/25</td>
<td><strong>Chapter 10: Intermolecular Forces</strong>&lt;br&gt;Dipole-dipole forces, dispersion forces, polarity and solubility, vapor pressures, solubility of gases, phase diagrams, the solid state, structures of metals, ionic solids, crystal structures.</td>
</tr>
<tr>
<td>2</td>
<td>2/1</td>
<td><strong>Chapter 10, cont.</strong></td>
</tr>
<tr>
<td>3</td>
<td>2/8</td>
<td><strong>Chapter 11: Properties of Solutions</strong>&lt;br&gt;Interactions between ions, vapor pressures of solutions, colligative properties, osmotic pressure</td>
</tr>
<tr>
<td>4</td>
<td>2/15</td>
<td><strong>Chapter 11, cont.</strong></td>
</tr>
<tr>
<td>5</td>
<td>2/22</td>
<td><strong>Chapter 12: Chemical Kinetics</strong>&lt;br&gt;Reaction rates, integrated rate laws, Arrhenius Equation, reaction mechanisms. <strong>Exam 1 – Thurs., Feb. 25 (Ch. 10, 11, 12)</strong></td>
</tr>
<tr>
<td>6</td>
<td>3/1</td>
<td><strong>Chapter 12, cont.</strong></td>
</tr>
<tr>
<td>7</td>
<td>3/8</td>
<td><strong>Chapter 13: Chemical Equilibrium</strong>&lt;br&gt;Dynamics of equilibria, equilibrium constants, Le Châtelier’s Principle.</td>
</tr>
<tr>
<td>8</td>
<td>3/15</td>
<td><strong>Chapter 13, cont.</strong></td>
</tr>
<tr>
<td>9</td>
<td>3/22</td>
<td><strong>Chapter 14: Acid and Base Equilibria</strong>&lt;br&gt;Strong and weak acids and bases, pH, pKb, pKa, pKw, acidic and basic salts. <strong>Exam 2 – Thurs., Mar. 25 (Ch. 13, 14)</strong></td>
</tr>
<tr>
<td>10</td>
<td>3/29</td>
<td><strong>Chapter 14, cont.</strong>&lt;br&gt;<em>Friday, April 2 spring holiday, no classes</em></td>
</tr>
<tr>
<td>11</td>
<td>4/5</td>
<td><strong>Chapter 15: Equilibria of other Reaction Classes</strong>&lt;br&gt;Common ion effect, buffer solutions, solubility product constant.</td>
</tr>
<tr>
<td>12</td>
<td>4/12</td>
<td><strong>Chapter 16: Thermodynamics</strong>&lt;br&gt;Spontaneous process, entropy, free energy, chemical equilibrium.</td>
</tr>
<tr>
<td>13</td>
<td>4/19</td>
<td><strong>Chapter 16, cont.</strong>&lt;br&gt;<strong>Exam 3 – Thurs., Apr. 22 (Ch. 15, 16)</strong></td>
</tr>
<tr>
<td>14</td>
<td>4/26</td>
<td><strong>Chapter 17: Electrochemistry</strong>&lt;br&gt;Voltaic cells, standard potential, concentration cells, batteries, fuel cells, corrosion.</td>
</tr>
<tr>
<td>15</td>
<td>5/3</td>
<td><strong>Chapter 17, cont.</strong></td>
</tr>
<tr>
<td>16</td>
<td>5/10</td>
<td>Final Exams</td>
</tr>
</tbody>
</table>
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**
- **Angelo State University Catalog**

Academic Integrity
Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university’s [Statement of Academic Integrity](#).

Accommodations for Students with Disabilities
ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student’s responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the [Student Disability Services website](#).

The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112
E-mails
For conducting official ASU business please use your official ASU e-mail account.
Please make sure that you check your ASU.EDU account on a regular basis. The
instructor may send important announcements regarding this course, homework, and/or
exams to your ASU e-mail account. You will not be able to use the excuse of not checking your e-mail with regard
to assignments, tasks, or exams you missed.
Any submitted e-mails are expected to be written in a professional format and
impeccable English. For more information how to communicate by e-mail please see:
https://www.wikihow.com/Email-a-Professor
The instructor will refuse to read and/or respond to any messages that do not comply
with such requirements.
The instructor will respond to legitimate e-mails within 24 - 48 hours during the week
and may not respond until after weekends or holidays if messages are received on any
of such days.

Virtual communication
Office hours and/or advising may be done with the assistance of the telephone,
Collaborate, Skype, Facetime, etc.

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.

Plagiarism
Plagiarism is a serious topic covered in ASU’s Academic Integrity policy in the Student
Handbook. Plagiarism is the action or practice of taking someone else’s work, idea, etc.,
and passing it off as one’s own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without
quotation marks and the source of the quotation. It is expected that you will summarize
or paraphrase ideas giving appropriate credit to the source both in the body of your
paper and the reference list.

Papers are subject to be evaluated for originality. Resources to help you understand
this policy better are available at the ASU Writing Center.
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.

Title IX at Angelo State University

The University prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title IX Compliance.

Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator at:

Michelle Miller, J.D.
Special Assistant to the President and Title IX Coordinator
Mayer Administration Building, Room 210
325-486-6357
michelle.boone@angelo.edu

You may also file a report online 24/7 at www.angelo.edu/incident-form.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.

For more information about Title IX in general you may visit www.angelo.edu/title-ix.

Required Use of Masks/Facial Coverings: As a member of the Texas Tech University System, Angelo State University has adopted the mandatory Facial Covering Policy to ensure a safe and healthy classroom experience. Current research on the COVID-19 virus suggests there is a significant reduction in the potential for transmission of the virus from person to person by wearing a mask/facial covering that covers the nose and mouth areas. Therefore, in compliance with the university policy students in this class are required to wear a mask/facial covering before, during, and after class. Faculty
members may also ask you to display your daily screening badge as a prerequisite to enter the classroom. You are also asked to maintain safe distancing practices to the best of your ability. For the safety of everyone, any student not appropriately wearing a mask/facial covering will be asked to leave the classroom immediately. The student will be responsible to make up any missed class content or work. Continued non-compliance with the Texas Tech University System Policy may result in disciplinary action through the Office of Student Conduct.

**Modifications to the Syllabus**
This syllabus, including grade evaluation and course schedule, is subject to modification. In particular, the COVID-19 pandemic may require significant changes in course delivery and content on potentially short notice.

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**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.