

**South Plains College**  
**Common Course Syllabus: CHEM 1412**  
**Revised Spring 2024**

**Department:** Science

**Discipline:** Chemistry

**Course Number:** CHEM 1412-002

**Course Title:** General Chemistry II

**Available Formats:** Conventional

**Campus:** Levelland

**Classroom:** S101

**Instructor Information:**

Shawn Horn, M.S.

Office: S107

E-mail: [sthorn@southplainscollege.edu](mailto:sthorn@southplainscollege.edu)

**OFFICE HOURS:**

M 1:00 – 4:00

T none

W 1:00 – 4:00

R none

F 1:00 – 3:00

**Course Description:** Chemical equilibrium; phase diagrams and spectrometry; acid-base concepts; thermodynamics; kinetics; electrochemistry; nuclear chemistry; an introduction to organic chemistry and descriptive inorganic chemistry. Basic laboratory experiments supporting theoretical principles presented in lecture; introduction of the scientific method, experimental design, chemical instrumentation, data collection and analysis, and preparation of laboratory reports.

**Prerequisites:** A grade of “C” or better in CHEM 1411

**Credit:** 4 **Lecture:** 3 **Lab:** 3

**Purchases:**

- General Chemistry II, 1<sup>st</sup> Ed., S. Horn (or General Chemistry) (**Required**)
  - Purchase instructions given in Course Resources section on Blackboard
- CHEM 1412 Lab Manual (**Required**)
- Safety Goggles/Glasses (**Required**)
- Scientific Calculator (**Required**)

**This course satisfies a core curriculum requirement:** Yes – Life and Physical Science

**Core Objectives Addressed:**

- **Communication skills** - to include effective written, oral, and visual communication
- **Critical Thinking skills** - to include creative thinking, innovation, inquiry and analysis, evaluation and synthesis of information
- **Empirical and Quantitative skills** - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
- **Teamwork skills** - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

**Student Learning Outcomes/Competencies:**

**From Lecture:**

1. State the characteristics of liquids and solids, including phase diagrams and spectrometry.
2. Articulate the importance of intermolecular interactions and predict trends in physical properties.
3. Identify the characteristics of acids, bases, and salts, and solve problems based on their quantitative relationships.
4. Identify and balance oxidation-reduction equations and solve redox titration problems.
5. Determine the rate of a reaction and its dependence on concentration, time, and temperature.
6. Apply the principles of equilibrium to aqueous systems using Le Chatelier's Principle to predict the effects of concentration, pressure, and temperature changes on equilibrium mixtures.
7. Analyze and perform calculations with the thermodynamic functions, enthalpy, entropy, and free energy.
8. Discuss the construction and operation of galvanic and electrolytic electrochemical cells and determine standard and non-standard cell potentials.
9. Define nuclear decay processes.
10. Describe basic principles of organic chemistry and descriptive inorganic chemistry.

**From Lab:**

1. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.
2. Demonstrate safe and proper handling of laboratory equipment and chemicals.
3. Conduct basic laboratory experiments with proper laboratory techniques.
4. Make careful and accurate experimental observations.
5. Relate physical observations and measurements to theoretical principles.
6. Interpret laboratory results and experimental data and reach logical conclusions.
7. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
8. Design fundamental experiments involving principles of chemistry and chemical instrumentation.
9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

### Course Evaluation:

**A** = 89.50 – 100%  
**B** = 79.50 – 89.49%  
**C** = 69.50 – 79.49%  
**D** = 59.50 – 69.49%  
**F** = below 59.49%

Lecture Exam 1: 100 pts  
Lecture Exam 2: 100 pts  
Lecture Exam 3: 100 pts  
Lecture Exam 4: 100 pts  
Pre-lab Quizzes: 60 pts (5 pts ea)  
Post-lab Questions: 60 pts (5 pts ea)  
Homework: 50 pts (5 pts ea)  
Final Exam: 100 pts  
Possible Bonus Points: 25 pts  
Total Possible Points: 655  
(One lowest lab and homework dropped)

**Attendance Policy:** It is important that you attend all lectures and labs to do well in this course. Attendance will be taken in the form of grades for work completed in class. There will be no makeup exams or labs. You will receive a ZERO for any homework, labs, or exams missed. If you are unable to finish this course, complete a withdrawal slip at the registrar's office. Absences caused by official South Plains College activities will be excused.

**Lecture Exams:** There will be 4 lecture exams; these exams will cover the materials discussed in the lectures, videos, and textbook. The schedule of the lecture exams is on the course schedule along with lecture information. Some information will be given on each exam such as constants, conversions, and charts. Only the materials discussed in the lectures and videos will be on the exam. You will be given **1 hour and 15 minutes** to finish the exam. There will be a review packet for each exam. The exams will be **closed-note**, but you can use a **3x5 notecard** for any supplementary information. Lecture exams will be entirely free-response, and the following directions will be given at the top of each exam:

*There are 5 questions on this exam. You must answer at least 3 questions. Each question answered beyond your 3<sup>rd</sup> question will count as bonus. Your best 3 questions will count towards your raw score. Bonus questions are worth 5 points each.*

- Lecture exam 1 (Chapters 11 and 12)
- Lecture exam 2 (Chapters 13 and 14)
- Lecture exam 3 (Chapters 15 and 16)
- Lecture exam 4 (Chapters 17 and 18)

*The materials scheduled for each lecture exam by subject to change, this change will be announced in advance if necessary.*

**Final Exam:** The final exam is cumulative of the full semester. It will have a similar format to the lecture exams except there will be 7 questions that you choose 5 from (the bonuses will be worth 7 points). The final exam will carry the same weight as the lecture exams, but additionally it will serve as a lecture exam grade replacer. If your final exam score is higher than one of your lecture exams, it will count as the final exam score and replace that score. This can only be used to replace your one lowest exam score. You may also use a 3x5 notecard on the final exam; however, **if you complete the Course Evaluation at end of the semester, you can take the final open-note.**

**Lab Experiments:** Students are expected to read the lab manual for the given experiment each week before coming to class. A pre-lab quiz will be given at the beginning of lab (5 pts). Lab data and calculations will be collected for grading at the end of each lab period (5 pts each).

**Lab Safety:** The chemistry laboratory is a potentially hazardous environment; therefore, all students must follow all of the safety rules passed out to you during the safety presentation. The students must also follow any specific safety rules listed in the lab manual and any that the instructor may announce during a lab period. A student not following the safety rules may be asked to leave the laboratory.

**Safety Rules:** These safety rules will be passed out in lab. The safety rules must be followed. Failure to do so can result in you being asked to leave the laboratory. You will be required to sign a sheet indicating you have read and agreed to follow the safety rules before being allowed to perform an experiment.

**For information regarding official South Plains College statements about intellectual exchange, disabilities, non-discrimination, Title IX Pregnancy Accommodations, CARE Team, and Campus Concealed Carry, please visit <https://www.southplainscollege.edu/syllabusstatements/>**

**COURSE SCHEDULE:** *The following table contains the tentative course schedule. All material (including lecture material, experiment material, and material scheduled for the lecture exams) is subject to change. Also, all dates are subject to change. Changes will be announced if necessary.*

<b>Week #</b>	<b>Tuesday</b>	<b>Thursday</b>
<b>1</b> 1/15	Intro/Syllabus	NO CLASS
<b>2</b> 1/22	CHEM I Lecture Review	Chp 11
<b>3</b> 1/29	CHEM I Lab Review	Chp 12
<b>4</b> 2/5	Lab Worksheet 1 Pgs. 62-64	<b>Exam 1</b>
<b>5</b> 2/12	Exp 1	Chp 13
<b>6</b> 2/19	Exp 2	Chp 14
<b>7</b> 2/26	Exp 3	<b>Exam 2</b>
<b>8</b> 3/4	Exp 4	Chp 15
<b>9</b> 3/11	<b>SPRING</b>	<b>BREAK</b>
<b>10</b> 3/18	Exp 5	Chp 16
<b>11</b> 3/25	Lab Worksheet 3 Pgs. 70-71	<b>Exam 3</b>
<b>12</b> 4/1	Exp 6	Chp 17
<b>13</b> 4/8	Exp 7	Chp 18
<b>14</b> 4/15	Exp 8	<b>Exam 4</b>
<b>15</b> 4/22	Exp 10	Chp 19
<b>16</b> 4/29	Exp 12	Chp 20

**FINAL EXAM SCHEDULE:**

Tuesday, May 7, 2023

10:15 – 12:15

Room: S101