I. INTRODUCTION

A. General Chemistry 2 is the second of two courses in the general chemistry sequence. Topics included in this course are chemical equilibrium; phase diagrams and spectrometry; acid-base concepts; thermodynamics; kinetics; electrochemistry; nuclear chemistry; an introduction to organic chemistry and descriptive inorganic chemistry. These topics will be explored through discussion and laboratory.

B. This course is required for students majoring in the science and science-oriented fields. This course may or may not be used as an elective. Please check your degree plan to determine the status of this course in your program of study.

C. The course is occupationally related and serves as preparation for careers in teaching, research, medicine, agriculture, and other science-related fields as well.

D. Prerequisite: CHEM 1411 (General Chemistry 1)

II. LEARNING OUTCOMES

Upon successful completion of this course, General Chemistry 2, the student will:

A. State the characteristics of liquids and solids, including phase diagrams and spectrometry.

B. Articulate the importance of intermolecular interactions and predict trends in physical properties.

C. Identify the characteristics of acids, bases, and salts, and solve problems based on their quantitative relationships.

D. Identify and balance oxidation-reduction equations, and solve redox titration problems.
E. Determine the rate of a reaction and its dependence on concentration, time, and temperature.

F. Apply the principles of equilibrium to aqueous systems using LeChatelier’s Principle to predict the effects of concentration, pressure, and temperature changes on equilibrium mixtures.

G. Analyze and perform calculations with the thermodynamic functions, enthalpy, entropy, and free energy.

H. Discuss the construction and operation of galvanic and electrolytic electrochemical cells, and determine standard and non-standard cell potentials.

I. Define nuclear decay processes.

J. Describe basic principles of organic chemistry and descriptive inorganic chemistry.

K. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.

L. Demonstrate safe and proper handling of laboratory equipment and chemicals.

M. Conduct basic laboratory experiments with proper laboratory techniques.

N. Make careful and accurate experimental observations.

O. Relate physical observations and measurements to theoretical principles.

P. Interpret laboratory results and experimental data, and reach logical conclusions.

Q. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.

R. Design fundamental experiments involving principles of chemistry and chemical instrumentation.

S. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.
III. INSTRUCTIONAL MATERIALS

The instructional materials identified for this course are viewable through www.ctcd.edu/books

IV. COURSE REQUIREMENTS

A. A student begins to earn his final grade in the course with the first class meeting. This grade will be determined by exam scores, laboratory assignments, and class attendance. Each student is expected to put forth 100% effort to understand the topics presented in this course.

B. Preparation for the final exam also begins with the first class meeting. The final exam will be comprehensive.

C. The student is expected to attend all lectures and to take adequate notes! If the student so desires, he or she may use an audio recorder to record lectures.

D. It is highly recommended that the student read all assigned text material, work all assigned textbook homework problems, and work additional suggested homework problems (called Problem Sets). Problem Set problems will be provided online but will not be graded. The student is strongly urged to work all homework problems! Chemistry is a problem-solving science, and the only way to be successful in this course is to spend a significant amount of time outside of class working problems and studying on your own. The success of each student will rely heavily on taking good lecture notes, reading the text, completing the homework, studying, and getting help when topics are not clear. The instructor does keep office hours. If something is not clear, take advantage of the instructor’s office hours to go by and ask questions. If the office hours are not convenient, an alternate time can be arranged. Chemistry is not a course where one can wait until the last minute and “cram” for a test. Do not fall behind!

E. The student should bring the textbook and all other necessary materials to each class meeting. The student should bring the lab manual, textbook, and all other necessary material to each lab session.
F. **Tardies and absences:** Regular and punctual attendance is essential for passing this course! Attendance will be checked at the beginning of each class. Do not be late to class! Coming to class late may adversely affect your grade and may result in your PERMANENT removal from the class! A student will be considered tardy if he is not in his seat when attendance is checked at the beginning of class or after any scheduled breaks. A total of four lecture tardies will result in the student’s course grade being lowered by 5 points (half a letter grade). Each additional tardy will result in another 1 point deduction of the course grade. The student may also face disciplinary action up to and including expulsion from the class. If a student is late to class, it is to his advantage not to enter the room and disrupt the class. If a student is more than 15 minutes late for a lecture or lab, he will be considered absent. It is the student’s responsibility to inform the instructor after class if he was tardy so that he will not be counted absent.

If a student is late to lab and misses any or all of the pre-lab talk, the instructor may not allow the student to perform the scheduled lab experiment. This may result in a grade of zero for that experiment. The instructor reserves the right to lock the door at the scheduled class start time.

More than a total of three absences (lecture + lab) will be regarded as insufficient attendance, which may result in an administrative withdrawal with a grade of "F" as stated in the college catalog. A record of attendance is kept for both lecture and lab.

Common courtesy is expected; arriving late and/or leaving early are disruptive to the flow of the class and should be avoided. Leaving class and returning to class during class (for whatever reason) is disruptive and should also be avoided. Any one student does NOT have the right to disrupt the learning process of the others in the class. Please advise the instructor before class if you need to leave class early for any reason.

G. **Students with grades of "D" or less should consult with the instructor voluntarily to ascertain the reason for this low average in the course. This conference should come as soon as possible after the grade reaches this danger point in order that the student can correct his problem before it is too late.**

H. **Academic Honesty:** All students are required and expected to maintain the highest standards of scholastic honesty in the preparation of all coursework and examinations. Examples of scholastic dishonesty include plagiarism, collusion, and cheating. Students guilty of scholastic dishonesty will be administratively dropped from the course with a grade of “F” and subject to disciplinary action, which may include suspension and expulsion.
Copying any part or all of another student’s lab report or lab Problem Set is considered cheating and will be dealt with accordingly. Possession or use of a lab report from a previous semester is also considered cheating.

I. Students must comply with laboratory safety regulations. In particular, the student must wear safety goggles and apron while working in the laboratory. Each lab period, students found not wearing safety goggles over their eyes will be given one warning. Students found not wearing their safety goggles a second time during that lab period will be dismissed from lab immediately. The student will receive a zero for that lab period. Any zero grades for not wearing safety goggles will not be dropped. Students will not be permitted to wear shorts, short skirts, short dresses, or sandals in the lab. All attire must come down to the ankles. Do not wear baggy clothing. Tank tops and halter tops are not permitted in lab. Shoulders and entire back must be covered. Only closed toe and closed heel shoes are allowed in the laboratory. The shoe must cover the entire foot.

The student is also responsible for the equipment issued him or her. The student will be assigned a drawer which can be locked for protection of the equipment. Required safety goggles and apron may be purchased at the CTC Bookstore. Safety goggles not purchased from the CTC Bookstore must be approved by the instructor. Additional safety rules will be provided on a separate handout.

J. Laboratory reports and Lab Problem Sets are due as indicated by the instructor.

K. If a student withdraws from a class or is administratively withdrawn, the student must check with the instructor concerning checking out of lab, paying any fines, and returning any checked-out equipment or materials. Failure to comply with the above process may result in a hold being placed on the student’s CTC records and transcripts. A grade of “F” may be assigned to the student’s transcript for the course by the instructor.

L. Each student must bring his own individual lab manual to each lab session.

M. Some lab experiments may require the student to write a formal lab report. The format for such reports will be provided on a separate handout.

N. Each student must attend only the lab section for which he/she is registered.

V. LECTURE EXAMINATIONS

A. There will be four lecture exams in addition to a comprehensive final exam. No make-up exams will be given for any reason! Pre-examination reviews are
usually not given. The exams may include any or all of the following types of questions: problem solving, multiple choice, true-false, fill in the blank, matching, discussion, identification, or essay. Only the Casio fx-260 scientific calculator or any other non-graphing calculator will be allowed for lecture and lab exams. The sharing of calculators will not be permitted during exams. If there is a discrepancy between an answer marked on the exam and an answer on the scantron sheet, the scantron answer will be used for grading purposes.

B. If a student misses one of the four periodic lecture exams, a grade of zero will be recorded for that exam. A student cannot miss two lecture exams and still pass the class.

C. Extra Credit: If a student scores higher on the final exam than on the lowest of the four lecture exams, the final exam grade will replace the lowest lecture exam grade. The final exam grade will also count as 20% of the total course grade. This allows a student to improve his or her grade in the event of a missed exam or a poor grade on one of the four lecture exam.

D. A student who fails to take the final exam will receive a zero for the final and a grade of "F" for the course.

E. During exams and quizzes, students may not leave the room. Students may not wear caps, hats, or visors during exams and quizzes. Cell phones, beepers, pagers, and all electronic devices (except calculator) must be turned off and stored during exams.

F. Students may not share calculators during an exam. If you forget your calculator on exam day, you are on your own!

VI. SEMESTER GRADE COMPUTATIONS

The course grade will be calculated as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 3</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 4</td>
<td>15%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Laboratory Average</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Course grades will be assigned according to the following scale:
90-100 = A  
80-89 = B  
70-79 = C  
60-69 = D  
< 59 = F

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR

A. **Course withdrawal:** It is the student's responsibility to officially withdraw from a course if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file a Central Texas College Application for Withdrawal (CTC Form 59). The withdrawal form must be signed by the student. The last day to withdraw from this class is Wednesday, August 3rd.

CTC Form 59 will be accepted at any time prior to Friday of the 12th week of classes during the 16-week fall and spring semesters. The deadline for sessions of other lengths is:

- 16-week courses: Friday of the 12th week
- 12-week courses: Friday of the 9th week
- 10-week courses: Friday of the 7th week
- 8-week courses: Friday of the 6th week
- 6-week courses: Friday of the 4th week
- 5-week courses: Friday of the 3rd week

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

A student who officially withdraws will be awarded the grade of "W" provided the student's attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the College before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.

B. **Administrative Withdrawal:** An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on CTC Form 59 for submission to the registrar.

C. **Incomplete, Course in Progress Grade:** The College catalog states, "An incomplete grade may be given in those cases where the student has completed
the majority of the course work but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course..." Prior approval from the instructor is required before the grade of "IP" for Incomplete is recorded. A student who merely fails to show for the final examination will receive a zero for the final and an "F" for the course.

D. **Cellular Phones**: Cellular phones (with or without associated headsets) will be turned off and put away while the student is in the classroom or laboratory. Failure to adhere to this policy may result in disciplinary action. Making and/or receiving cell phone calls or sending and/or receiving text messages during lecture or lab is strictly forbidden. If a student’s cell phone rings or makes any noise during an exam, he/she will be considered finished with the exam at that time and must turn it in. If a cell phone rings or makes any noise during lab, the student will be considered finished with the experiment at that time and must turn it in. For emergencies or students on call, see (H) below.

E. **American’s With Disabilities Act (ADA)**: Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Explore the website at [www.ctcd.edu/disability-support](http://www.ctcd.edu/disability-support) for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

F. **Instructor Discretion**: The instructor reserves the right of final decision in course requirements.

G. **Civility**: Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion. Minimal civility includes:

1. Being in class on time;
2. Staying in class for the entire class period;
3. Leaving early occurs only after informing the teacher, prior to class, of an unavoidable conflict requiring your early departure (if possible, position yourself close to the door for a minimum disruption to the class);
4. Avoiding such uncivil conduct as talking, sleeping, reading papers/magazines, or working on some other class homework assignment; and
5. Using socially acceptable language in classroom discussions.
H. Emergency messages will be delivered to students in classes by the Student Life Office; the Student Life Office number is 526-1258. Emergency messages can also be given to students through the science department office by calling 526-1288 for delivery to the classroom.

NOTE: The procedures stated for this course are subject to change in the event of extenuating circumstances.