Introductory chemistry – CHEM 1305  
Department of Physical and Environmental Sciences  
Spring 2020

A. Course information

Course number/section: CHEM 1305_002  
Class meeting time: TR 12:30 – 01:45 p.m.  
Class location: IH-162  
Course Website: https://bb9.tamucc.edu/

B. Instructor information

Instructor: Dr. Narendra Narayana  
Office location: Center for Science 130D  
Office hours: M 1 p.m. – 2 p.m.; T 03:00 p.m. – 05:00 p.m. W noon – 2 p.m. or by appointment  
Phone: 825-3644  
E-mail: nnarayana1@tamucc.edu  
Appointments: please send email

C. Course description

Catalog Course Description

3 sem. hrs. (3:0) A one-semester principles course for students in non-science related majors covering the major concepts of chemistry (atomic structure, bonding, stoichiometry, elementary thermodynamics) and the role of chemistry in contemporary society (polymers, energy, pollution, etc.). Will not substitute for CHEM 1411. TCCNS Equivalent: CHEM 1305. This course counts toward the natural science component of the University Core Curriculum. Either CHEM 1305 or CHEM 1411, but not both, may be applied towards the core requirement. This course is offered in fall, spring and both summer sessions. In addition, it is offered as a regular in-person course and an online course.

Extended Course Description

This course is designed for students in non-science related majors. This one-semester course will cover basic concepts in chemistry and its influence on our day-to-day life. Chem-1305 is a natural Science component of the University Core Curriculum and is not a substitute for Chem-1311.

Course objectives: In this course students will learn:

- Sustainable practices for the future – recycling, ecological balance, Green Chemistry, and our responsibilities as citizens to protect our planet.
• Composition of air – essentials and pollutant components; Classification of matter – pure substances, elements, and compounds; Atoms and molecules; Ozone layer.

• Atomic structure and electromagnetic radiation; Ultraviolet radiation and its biological effects.

• The chemistry of global climate change – The greenhouse effect; Molecular shape and molecular vibration. Quantitative measurement of molecules and the mole concept.

• Thermal energy – combustion, fossil fuels, coal, petroleum, biofuels, and electricity.

• Water is necessary for life. Unique properties of water. Physical forces or molecular interactions – Hydrogen bonding and ionic compounds.

• The danger of acid rain. Acid-base chemistry. Steps to counter the threat of acid rain.

• Nuclear energy – Fission reaction – nuclear reactors – electricity. Radioactivity. Pros and cons of nuclear power.

• Chemical energy – batteries and electron flow. Renewable energy resources.

• Polymers – macromolecules, plastics,

• Design of drugs – Aspirin.

• Nutrition – trans-fats, carbohydrates, proteins, and vitamins.

This course shall provide a working knowledge on the impact of science specifically chemistry on our day-to-day life and the future. The advances in chemical science leading to large-scale or industrial applications and the benefit to humanity shall be presented.

D. Pre-requisites: none (for non-science major)

Co-requisites: none

E. Required Textbook(s), readings and supplies


CONNECT Student Section Code (comes with new textbook or can be purchased separately) is optional.
Other references: none

Supplies: Scientific Calculator

F. Student learning outcomes and assessment

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course students should be:

1. Aware of the benefits of the sustainable practices and green chemistry principles.
2. Familiar with the composition of air, atmospheric pollution, and the importance of ozone layer in screening the energetic UV radiations.
3. Knowledgeable about atoms, molecules, compounds, mixtures, and radiations.
4. Able to recognize a variety of electromagnetic radiations including visible light and UV radiations and their impact on biological systems.
5. Well informed about the wealth of available data in support of global climate change.
6. Knowledgeable about fossil fuels, biofuels, nuclear energy, and other forms of energy required for day-to-day activities.
7. Knowledgeable about the physical and chemical properties of water, its role in living systems, and water pollution.
8. Aware of the principles of the generation of nuclear energy, and its use in the military.
9. Knowledgeable about various forms of batteries and renewable energy resources.
10. Aware of the advances in chemistry leading to products such as plastics and drugs used to cure diseases.

Students should be able to - grasp the law of conservation of matter via balancing of chemical reactions, know the unit of measurement of reagents (mole), and be familiar with the shapes and molecular formulae of some of the common chemicals. Students shall be better informed from a scientific perspective to influence policy making at the local, national, and at international level. Students shall recognize the global nature of the impact of human activities through some of the scientific data presented in this course.

Assessment of students learning is based on the lecture exams and quizzes
through-out the semester as detailed below.

G. Instructional methods and activities

Lecture presentations, assignments, reading materials, and other course-related information will be posted on the blackboard. Lectures will be followed by a review of chapters, problem solving, and student interaction.

H. Major course requirements and grading

**Attendance:** Attendance is highly recommended to understand the concept in its true perspective. That is to connect different aspects of chemical principles to understand a specific phenomenon. Irregularity inevitably leads to poor grade. Please arrive on time and remain in the class until the lecture is completed to be eligible for attendance points. Arriving later than 10 minutes after the start of the class or leaving early is not acceptable in the interest of the whole class. Please minimize distractions in the class as some students tend to go out for a drink of water or restroom use. Keep in mind if a handful of students does this in a large class (about 80 students) this will be too much of a disturbance. Please be aware that some of your own classmates are not comfortable with that type of disturbances. I suggest that you plan appropriately so that you do not have to leave the class in between the start and the conclusion. Please avoid whispering with your neighbors as it is known to distract students in the vicinity. Please note, the class time belongs to all students and the teacher, therefore, we need to be mindful of others that means, we together must avoid disturbances whatsoever!

**Exams:** There will be two examinations in addition to a comprehensive final examination. Examinations will be predominantly multiple choices and may include short answers and brief calculations. All answers on exam scantron cards are final, so please fill in your answer choices on your scantron sheet carefully.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Points</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>100 pts</td>
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<tr>
<td>Exam 2</td>
<td>100 pts</td>
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<tr>
<td>Final Exam</td>
<td>100 pts</td>
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<td><strong>Total</strong></td>
<td><strong>300 pts</strong></td>
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Exams and quizzes will take place during regular class time. In general, there are no make-up exams or quizzes. Please let me know ahead of time if you have a university-approved excuse, if possible, alternate arrangements can be made. I will not “drop” any of the examinations or quizzes in the calculation of your final grade.

**Course Grading:** The lecture component will count for 95% of the grade and the attendance component for 5%. The scale below indicates the minimum course score (out of a possible 100 points) required to obtain a specific grade. A combined grade for both lecture and attendance will be awarded for the course.
<table>
<thead>
<tr>
<th>Grade</th>
<th>Score</th>
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<tbody>
<tr>
<td>A</td>
<td>90</td>
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<tr>
<td>B</td>
<td>80</td>
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<tr>
<td>C</td>
<td>70</td>
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<tr>
<td>D</td>
<td>50</td>
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<tr>
<td>F</td>
<td>&lt;50</td>
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</tbody>
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The course score is calculated by adding the lecture (95) and attendance (5) scores:

Lecture score: \( \frac{(\text{exam points} + \text{quiz points})}{300} \times 95 \)

Attendance score: \( \frac{(\text{points obtained})}{\text{Maximum points}} \times 5 \)

As noted above, there are 300 points possible in lecture from the three regular and one final examination, plus quiz/attendance score that accounts for 5% of the total grade.

**Study guidance:** I encourage students to prepare a short description (one or two pages) of the material covered in the class on the same day while it is still fresh in your memory. Read or at least skim through the material discussed in the previous class before attending the class. Because the class material builds on itself, you cannot afford to get behind. In line with the adage – “well begun is half done”, I urge students to keep up with the subject as we proceed through the semester. Do end-of chapter problems, come to class, and review your notes on a weekly basis. Forming a study group with other students is another strategy many students find helpful.

I. **Course content/schedule**

**Tentative Course Outline**

*Disclaimer: This syllabus is subject to change*

<table>
<thead>
<tr>
<th>Date</th>
<th>Chapter</th>
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<tbody>
<tr>
<td>January 21</td>
<td>Introduction / Chapter 1</td>
</tr>
<tr>
<td>January 23</td>
<td>Chapter 2</td>
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<td>January 28</td>
<td>Chapter 2</td>
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<td>January 30</td>
<td>Chapters 2 &amp; 3</td>
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<td>February 04</td>
<td>Chapter 3</td>
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<td>February 06</td>
<td>Chapter 3</td>
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<td>February 11</td>
<td>Chapter 3</td>
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<td>February 13</td>
<td>Chapter 4</td>
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<td>February 18</td>
<td>Chapter 4</td>
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<td>Date</td>
<td>Event</td>
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<tr>
<td>February 20</td>
<td>Chapter 5 &amp; Review Session</td>
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<tr>
<td>February 25</td>
<td><strong>Exam 1</strong></td>
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<td>February 27</td>
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<tr>
<td>March 03</td>
<td>Chapters 5 &amp; 8</td>
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<td>March 05</td>
<td>Chapter 8</td>
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<td>March 10</td>
<td>Spring Break – No class</td>
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<td>March 12</td>
<td>Spring Break – No class</td>
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<td>March 17</td>
<td>Chapter 8</td>
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<td>March 19</td>
<td>Chapter 8</td>
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<td>March 24</td>
<td>Chapter 6</td>
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<td>March 26</td>
<td>Chapter 6</td>
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<td>March 31</td>
<td>Chapter 6</td>
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<tr>
<td>April 02</td>
<td>Chapter 7 &amp; Review Session</td>
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<td>April 07</td>
<td><strong>Exam 2</strong></td>
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<td>April 09</td>
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<td>April 14</td>
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<td>April 28</td>
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<td>April 30</td>
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<tr>
<td>May 05</td>
<td>Chapter 11, Final Lecture</td>
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<tr>
<td>May 14</td>
<td><strong>Final Exam (Comprehensive)</strong></td>
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Note: I have allocated approximately 3 hours of lecture time for each of the chapters covered. Some chapters may take more or less than the allocated time. For a good flow of materials covered in this course, the sequence of chapters in the syllabus differs from that presented in the text. Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. Course policies

Attendance/Tardiness

Students are encouraged to attend all lecture classes. Attendance will be taken in the class and 5% of the total grade is allocated for attendance.

Late Work and Make-up Exams

There is no lab component for this course. Please inform Dr. Narayana ahead of time if you have a university-approved excuse, if possible, alternate arrangements can be made for make-up exams.
Extra Credit

Depending on the class performance there may be an opportunity for extra credit to enhance the students’ grade points via assignments or quizzes. However, please note this is not a routine procedure and not an obligation for the course. I shall decide on extra credits during the course of the semester.

Cell Phone Use

Cell phone use and photography is prohibited in the classroom. This is a severe distraction to the entire class. Cell phones are not allowed during all quizzes and exams or you will receive a zero!!

Laptop Use

Use of laptop in the class is permitted provided it is used solely for taking notes related to the ongoing lecture in the classroom. Further its use should not distract or interfere with other students in the class.

Food in Class

Although food is allowed in the lecture classes, please consume only as a necessity on some occasions and ensure it does not distract the neighbors.

Missed Exam

If a student is absent for the exam on the designated date, he or she should provide a university-approved permission to take the exam at a mutually convenient date. Regarding quiz, if a student is absent on the day of the quiz, the student forfeits the quiz points unless there is a university-approved excuse.

Participation

Students are encouraged to participate collectively in the class discussion and should not involve in cross talk with the neighbors privately on the subject matter during the lecture period. You are expected to be attentive and ask or answer pertinent questions.

Others

Decorum: Please maintain absolute silence in the class, that is no whispering and cross talk during the lecture. The best way to encourage learning is to provide an environment conducive to listening, concentration, and discussion. As in any class, students are expected to maintain the highest standards of decorum and to conform to college-level standards of ethics and academic integrity. Please note that I am very sensitive for disturbances so does many students if not all, so I urge all students to be focused throughout the class time (only for an hour and 15 minutes please!). Cell phone use
and photography is prohibited in the classroom. Please turn OFF your cell phone while in the class. Electronic interruptions will NOT be allowed, and laptops are to be used only for the lecture material. Most of these involve common sense and courtesy. All students are expected to treat other students and the instructor with due respect. If a student’s behavior breaches the general code, the student will be asked to leave the class and continued miss-conduct can lead to further disciplinary action. Please refer to the section on academic policies and regulations in the university catalog for a more thorough description of these expectations.

**Student responsibility**: Student should be aware of the contents of this syllabus and the course website on Blackboard. Announcements and changes are communicated in the classroom, Blackboard, and/or emails.

**K. College and University policies**

**Academic Integrity (University)**

University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

**Classroom/Professional Behavior**

Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

**Statement of Civility**

Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high-quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.
Deadline for Dropping a Course with a Grade of W (University)

I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar [http://www.tamucc.edu/academics/calendar/] for the last day to drop a course.

Grade Appeals (College of Science and Engineering)

As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C0.03, Student Grade Appeals. These documents are accessible through the University Rules website at [http://academicaffairs.tamucc.edu/rules_procedures/assets/13.02.99.c0.03_student_grade_appeals.pdf] and the University Handbook of Rules and Procedures [http://academicaffairs.tamucc.edu/rules_procedures/index.html]. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

Disability Services

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816. [http://disabilityservices.tamucc.edu/]

Statement of Academic Continuity
In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue using Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. Other information

Academic Advising

The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is in Center for Instruction 350 or can be reached at (361) 825-3928.

General Disclaimer

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.