A. Course information

Course number/section: CHEM 1411_008
Class meeting time: TR 3:30 – 04:45 p.m.
Class location: EN-101
Course Website: https://bb9.tamucc.edu/

B. Instructor information

Instructor: Dr. Narendra Narayana
Office location: Center for Science 208
Office hours: M noon – 1 p.m.; T 03:00 p.m. – 05:00 p.m. W 11 a.m. – 1 p.m.
or by appointment
Phone: 825-3644
E-mail: nnarayana1@tamucc.edu
Appointments: please send email

C. Course description

Catalog Course Description

4 sem. hrs. (3:1): This course deals with the basic principles of chemistry for science majors. The topics covered include units, components of matter, stoichiometry, types of chemical reactions, kinetic theory of gases, thermochemistry, quantum theory of atomic structure, chemical periodicity, models of chemical bonding, shapes of molecules, and theories of covalent bonding. The associated laboratory provides skills in chemical experiments. 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.

Extended Course Description

This course is designed for students in science-related majors. Upon successful completion of this course, students can continue in upper level chemistry courses, General Chemistry II, Organic Chemistry, Biochemistry, and others.

Course objectives: In this course students will learn:

• Definitions, uncertainty in measurements, and units of measurement

• Classification of Matter

• Mole, balancing of chemical equations, and stoichiometry
• The major classes of chemical reactions – Oxidation-reduction, acid-base, and precipitation reactions

• Kinetic theory of gases – Gas laws

• Thermochemistry – energy flow, chemical change, and thermodynamic principles

• Quantum theory of atoms – Atomic spectra and wave-particle duality

• Electronic configuration and chemical periodicity

• Chemical bonding – covalent bonding, ionic bonding, and electronegativity and bond polarity

• The shapes of molecules – VSPER theory

• Theories of covalent bonding – Valence bond theory and molecular orbital theory

This course shall provide knowledge to continue on to higher chemistry courses and biology courses where chemistry background is required.

D. Pre-requisites: None

Co-requisites: SMTE 0093, a laboratory safety training course

E. Required Textbook(s), readings and supplies


Optional Textbook(s) or other references:
None

Supplies: Scientific Calculator; Lab coat and goggles for laboratory work

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. able to convert units of measurements and determine significant figures
2. able to distinguish materials at the atomic scale
3. able to perform conversions between different physical quantities and balance chemical equations
4. able to recognize acid-base reactions, oxidation-reduction reactions, and precipitation reactions.
5. knowledgeable about gas laws
6. knowledgeable about Thermodynamic properties and parameters
7. knowledgeable about Quantum theory and atomic structure
8. aware of the electronic configuration and atomic properties
9. knowledgeable about different chemical bonding types
10. able to assign shapes bond orientation about an atom resulting in molecular shapes
11. aware of theory of covalent bonding

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

G. **Instructional methods and activities**

Face-to-face lecture presentations, assignments, reading materials, and other course-related information will be posted on the black board. Lectures will be followed by a review of chapters, problem solving, and student interaction. Online homework is assigned.

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 three 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>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>100 pts</td>
</tr>
<tr>
<td>Exam 2</td>
<td>100 pts</td>
</tr>
<tr>
<td>Exam 3</td>
<td>100 pts</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100 pts</td>
</tr>
</tbody>
</table>

Total 400 pts

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 at all 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 scale below indicates the minimum course score (out of a possible 100 points) required to obtain a particular grade.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>90</td>
</tr>
<tr>
<td>B</td>
<td>80</td>
</tr>
<tr>
<td>C</td>
<td>70</td>
</tr>
<tr>
<td>D</td>
<td>50</td>
</tr>
<tr>
<td>F</td>
<td>&lt;50</td>
</tr>
</tbody>
</table>

Lecture score: \( \frac{(\text{exam points} + \text{quiz points}) \times 50}{400} \)

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

As noted above, there are 400 points possible in lecture from the three regular and one final examination (50%), plus attendance score (5%) plus ALEKS score (20%) plus Lab score (25%) will add up to a final score for computing the final letter 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>
</tr>
</thead>
<tbody>
<tr>
<td>January 14</td>
<td>Introduction / Chapter 1</td>
</tr>
<tr>
<td>January 16</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>January 23</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>January 28</td>
<td>Chapters 2</td>
</tr>
<tr>
<td>January 30</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>February 04</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>February 06</td>
<td>Chapter 4 &amp; Review Session</td>
</tr>
<tr>
<td>February 11</td>
<td><strong>Exam 1</strong></td>
</tr>
<tr>
<td>February 13</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>February 18</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>February 20</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>February 25</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>February 27</td>
<td>Chapters 6</td>
</tr>
<tr>
<td>March 04</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>March 06</td>
<td>Chapter 7 &amp; Review session</td>
</tr>
<tr>
<td>March 11</td>
<td>Spring Break – No class</td>
</tr>
<tr>
<td>March 13</td>
<td>Spring Break – No class</td>
</tr>
<tr>
<td>March 18</td>
<td><strong>Exam 2</strong></td>
</tr>
<tr>
<td>March 20</td>
<td>Chapter 7</td>
</tr>
<tr>
<td>March 25</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>March 27</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>April 01</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>April 03</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>April 08</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>April 10</td>
<td>Chapters 10 &amp; Review Session</td>
</tr>
<tr>
<td>April 15</td>
<td><strong>Exam 3</strong></td>
</tr>
<tr>
<td>April 17</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>April 22</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>April 24</td>
<td>Chapter 11</td>
</tr>
<tr>
<td>April 29</td>
<td>Chapter 11</td>
</tr>
<tr>
<td>May 01</td>
<td>Chapter 11, Final Lecture &amp; Review session</td>
</tr>
<tr>
<td>May 06</td>
<td><strong>Final Exam (Comprehensive)</strong> 1:45 p.m. – 04:15 p.m.</td>
</tr>
</tbody>
</table>
Note: I have allocated approximately 2.5 hours of lecture time for each of the chapters covered. Some chapters may take more or less than the allocated time. 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 a lab component for this course. Please see the syllabus pertinent to your lab section on the Black Board. Please inform Dr. Narayana ahead of time if you have a university-approved excuse, if at all possible, alternate arrangements can be made for make-up exams. Student will not be allowed to take the exam if he/she arrives after the first test taker has left the examination hall.

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 class room. 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 class room. 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. If you miss an exam and unable to provide university approved permission, then, the score obtained in the final exam will be used for the missed exam. In regards to the 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 class room. 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.

Mid-term grades will be computed using lecture grade and attendance up to that point.

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.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.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 through the use of 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 located 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 and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.