Intent of Course: This course is the foundation course in chemistry for all science majors that is designed for a concise study of general chemistry, and its mission is to introduce the Fundamental Aspects of Chemical Principles and General Concepts of Chemical Calculations. An emphasis is placed on the development of critical thinking & complex problem solving skills. One of the primary goals of the course has been focused on a thorough understanding of Intermolecular Attractive Forces & Phase Changes; Thermodynamics; Chemical Equilibria; Chemical Kinetics; Redox Potential; Acid-Base Theories; Reactions in Aqueous Systems etc. The chemistry of metals & non-metals along with Nuclear Chemistry will also be discussed concisely. Another goal is to prepare the students for organic / upper level chemistry courses. This is a very challenging course with huge study materials in a very condensed manner for a relatively short time, and students need to work very hard on a regular basis to achieve the desired level of success.

Meeting Time: Lecture: Tue & Thu; Sec 002: 12:30 – 1:45 pm; Sec 003: 2:00 – 3:15 pm; ST-106

Office Hours: Tue, Thu: 3:30 – 5:00 pm; Wed: 12:30 – 2:00 pm; + (Group Discussion: 11-12:30); CS-205

If you can’t make it to any of these times, feel free to stop by my office at any time (if I am busy you may have to make a return visit) or contact me to set up an appointment. My full schedule is posted outside my office (CS-205) and also posted into Blackboard.

If required, Group Discussion/Study Session will be conducted once in every 2 weeks (at my own discretion) If not mentioned otherwise, usual schedule for such discussions will be on Wed from 11am - 12:30pm in CS-205. However, the meeting time & place will be additionally announced during lecture or via email. If there is no students show-up by 11:15 pm, then the group discussion session will be converted into regular office hours for that particular date.

Class Website: Most announcements, forms, handouts, lecture notes, quizzes, assignments, learning materials etc. are either posted, or will be posted on the Blackboard webpage. You will be able to login using your username & Password. At times, important information related to learning materials, or any changes in course syllabus will be sent to your islander email.

Research Scope: Although Undergraduate Research Opportunities are available with me for higher level Chemistry Major Students, but for the lower-level courses I’ve limited research activity in my research group. However, any student of Chem 1312, interested to take participation in research activity are always welcome; and may contact me individually during my office / research hours (my schedule posted outside my office and will also be available onto class Website).
CHEM 1312 (GENERAL CHEMISTRY II) COURSE SYLLABUS

Learning Outcomes: It is expected that completion of CHEM 1312 will enable students understanding the following specific topics of chemistry: i) Nature of intermolecular forces ii) Solutions and Colligative properties iii) Thermodynamic properties & functions iv) Acid-Base theories v) basic concepts of aqueous ionic equilibrium vi) in-depth understanding of Chemical Equilibrium vii) Redox systems & Redox Potential viii) Order of reactions, reaction rates & collision theory ix) Radioactivity and Nuclear Transformations. In addition, students are also anticipated to learn the application of chemical principles and calculations in real-world problem solving.

Prerequisite: 1) CHEM 1311

Textbook: Chemistry, The Molecular Nature of Matter & Change by Martin S. Silberberg, 6e (Recommended)


Supplies: 1) ARIS Access Code (optional); 2) Scientific Calculator (required) 3) A 3-ring Binder. The binder must be capable of holding ~300 pages of lecture notes/assignments/handouts etc. Whenever possible, lecture notes will be made available through Blackboard.

Attendance: Lecture attendance is strongly recommended and required. Beyond several (over 10%) unexcused absences, final grades may be lowered (at instructor’s discretion) by 1 point for each unexcused absence. Additionally, students are responsible for all announcements in the lecture, regardless of whether the student is present or absent.

Do not miss lecture! If you examine the academic calendar for spring 2012, you will find that we should have exactly 30 lecture periods. I would like to make efficient use of this time. There is no doubt that a student who attends lecture does much better on exams. If you cannot attend a class, speak to me at your next convenience or a classmate to determine what was discussed in the lecture that you missed.

In-class Activity: Pop-up quizzes: There will be unannounced pop-up quizzes from the lecture of previous class or from the same class. So make sure to come prepared in the class and be attentive during the lecture periods so that you may not miss those bonus points*. * See below; there is no make-up for Pop-up Quiz that given during the lecture periods.

Home Assignments: Occasionally, some descriptive type questions will be given as optional home assignments, including reading assignments (selected text) and worked-out examples. Typically, descriptive type questions are from the lecture materials. This will help you developing your writing skill and power of better understanding subject materials. Based on your performance, including class activity some Bonus Points (up to max. 5%) will be awarded to your overall aggregate. Total 3 - 4 home assignments (optional) will be given throughout the semester. A hard copy (legible & written using a pen) of each home assignment must be submitted by the student individually before the deadline. The detail guidelines for the assignments, deadline, grading criteria and earning bonus points will be explained at a relatively later stage either via blackboard/email or in the lecture period. Experience revealed that students, who do not complete homework/assignment, rarely succeed in the course.
CHEM 1312 (GENERAL CHEMISTRY II) COURSE SYLLABUS

Course Content:  The following is the tentative chronological order of topics to be covered during lectures:

**Tentative Lecture and Exam Schedule (subject to change based on lecture progress):**

<table>
<thead>
<tr>
<th>Calendar Period</th>
<th>Lecture Chapter #</th>
<th>Textbook Chapter #</th>
<th># LP</th>
<th>Chapter Title / Topic</th>
<th>Important Dates for Home Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 12</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>Introduction</td>
<td>15-min Class Test</td>
</tr>
<tr>
<td>Jan 17-24</td>
<td>Chapter 1</td>
<td>Chap. 12</td>
<td>3</td>
<td>Intermolecular Attractive Forces &amp; Phase Change</td>
<td>Home Assignment 1 Posting Date: 01/31/12</td>
</tr>
<tr>
<td>Jan 26-31</td>
<td>Chapter 2</td>
<td>Chap. 13</td>
<td>2</td>
<td>Solutions and Colligative Properties</td>
<td>Home Assignment 1 Due Date: 02/07/11</td>
</tr>
<tr>
<td>Feb 02-07</td>
<td>Chapter 3</td>
<td>Chap. 6</td>
<td>2</td>
<td>Thermochemistry</td>
<td>Home Assignment 2 Posting Date: 02/21/12</td>
</tr>
<tr>
<td>Feb 09-21</td>
<td>Chapter 4</td>
<td>Chap. 17</td>
<td>4</td>
<td>Chemical Equilibrium</td>
<td>Home Assignment 2 Due Date: 03/01/12</td>
</tr>
<tr>
<td>Feb 23- Mar 08</td>
<td>Chapter 5</td>
<td>Chap. 16</td>
<td>4</td>
<td>Chemical Kinetics</td>
<td>Home Assignment 3 Posting Date: TBA</td>
</tr>
<tr>
<td>Mar 20-29</td>
<td>Chapter 6</td>
<td>Chap. 18</td>
<td>4</td>
<td>Acid-Base Theory</td>
<td>Home Assignment 3 Due Date: TBA</td>
</tr>
<tr>
<td>Apr 05-12</td>
<td>Chapter 7</td>
<td>Chap. 19</td>
<td>3</td>
<td>Ionic Equilibrium in Aqueous Media</td>
<td>Home Assignment 4 Posting Date: TBA</td>
</tr>
<tr>
<td>Apr 17-19</td>
<td>Chapter 8</td>
<td>Chap. 20</td>
<td>2</td>
<td>Thermodynamics</td>
<td>Home Assignment 4 Due Date: TBA</td>
</tr>
<tr>
<td>Apr 24</td>
<td>Chapter 10</td>
<td>Chap. 24</td>
<td>1</td>
<td>Nuclear Chemistry</td>
<td>Bonus Questions Posting Date: 03/11/12</td>
</tr>
<tr>
<td>Apr 26</td>
<td>Chapter 9</td>
<td>Chap. 21</td>
<td>1</td>
<td>Redox Potential &amp; Redox Systems</td>
<td>Bonus Questions Due Date: 05/01/11</td>
</tr>
</tbody>
</table>

# LP = Total number of lecture periods required to study the respective chapters

**Evaluation:**

Final Letter Grades (A, B, C, D & F) for the course will be based on the 3 Class Exams (60 min. duration), 5 test quizzes, and a comprehensive 2-hour Final Exam. Bonus points (in-class activity, home assignments),* earned if any, should be added to the overall score to determine the final letter grade for the respective students.

The approximate %-distribution for each category is as follows:

- Exam 1: 20%
- Exam 2: 20%
- Exam 3: 20%
- Test Quiz (5) 20%
- Final Exam 20%
- Total (Overall) 100%
- Assignments/Class Activity 5% (Additional Extra Credit awarded as Bonus)
CHEM 1312 (GENERAL CHEMISTRY II) COURSE SYLLABUS

Quizzes: For each chapter points will be offered by means of test quizzes, which may take the form of in-home quizzes. Each quiz will consist of about 40-50 multiple-choice type questions. These points will be added to determine your final grading as per above stated evaluation guidelines. For such test quizzes always a submission deadline will be maintained. After the deadline submitted quiz will not be evaluated and no points will be offered. At times, some practice quizzes will also be given through Blackboard or during study sessions. However, practice quizzes are just for practice purposes, and no points will be offered. The test quizzes schedule is given below. The purpose of the chapter test quizzes is to help students evaluate their understanding of the materials before the exam. Individual answer sheet (*scantron; Form # 16504; available outside CS-205) for test quizzes will not be available for review. However, correct answers for the test quizzes will either be posted into Blackboard or be available in my office. There are no make-ups for missed quizzes. (*) Detail instruction will be given in lecture.

<table>
<thead>
<tr>
<th>Quiz #</th>
<th>Posting Date</th>
<th>Due Date (deadline)</th>
<th>Lecture Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz 1</td>
<td>01/31/12</td>
<td>02/07/12</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Quiz 2</td>
<td>02/17/12</td>
<td>02/27/12</td>
<td>3 - 4</td>
</tr>
<tr>
<td>Quiz 3</td>
<td>03/24/12</td>
<td>04/02/12</td>
<td>5 - 6</td>
</tr>
<tr>
<td>Quiz 4</td>
<td>04/19/11</td>
<td>04/26/12</td>
<td>7 - 8</td>
</tr>
<tr>
<td>Quiz 5</td>
<td>04/24/11</td>
<td>04/30/11</td>
<td>9 - 10</td>
</tr>
</tbody>
</table>

Study Sessions: If adequate number of students feel interest in group discussion, then study sessions will be held approximately once biweekly, subjected to the availability of room and final confirmation from the lecturer. Essentially the study sessions are during group discussion hrs on Wed. Exact schedule is to be announced later. Attendance Optional!

Exam Attendance: Exam attendance is required. If you are missing an exam owing to unavoidable, honorable reasons, you must contact me directly (phone or email) before the exam. Exam make-up and credit will be at the discretion of the instructor. Documentation for illnesses/other reasons may be required. Final Exam is mandatory. If you miss your final Exam you may receive a Failing Grade. There is not any make-up date/alternative time for the Final Exam. In general, all Exams are mostly multiple choice types.

Score Posting: Individual scores (%) for each exam, test quiz, home assignment will be announced individually (in office hours), or posted (blackboard website) within 3 working days after the completion of each exam, quiz, home assignment and in-home test taken. Final letter grade will be offered based on the guideline of obtained overall % score.

Classroom Conduct: Respect to your teacher and for your fellow classmates is expected during all the lectures and laboratory periods. Therefore, arriving late, talking, texting, reading newspapers / magazines, or doing homework during lecture/lab period will not be tolerated. Please turn off / put in vibration mode all cell phones during your lecture period. Please no sleep & no hat on your head when you are in the class. Use of all electronic devices, including your laptops and cell phones are strictly prohibited during the lecture periods, especially when lecture is in progress.
**CHEM 1312 (GENERAL CHEMISTRY II) COURSE SYLLABUS**

**Academic Honesty:** Policies on academic honesty and plagiarism of Texas A&M University-Corpus Christi will be used. Violations of these policies will be taken very seriously. Violators will be prosecuted according to the procedures established by The University (TAMU-CC). Please refer to the student bulletin for TAMU-explanations of academic honesty & plagiarism & procedures for prosecution.

**Final Exam / Grades:** Pre-scheduled date/time for the Final Exam has already been stated, Final Confirmation will be announced in due time. Final grading (%) will be posted tentatively within 3-5 business days as per TAMU-CC academic policy.

**Exams:** There will be a total of three **standard exams** worth 100 points each, and a comprehensive final exam (100 points). The tentative schedule for the class exams and final exam is given below.

*Makeup exams will be administered for rare exceptions such as death in the family, verifiable hospitalization, and other reasons I deem as appropriate. If you are unfortunate to find yourself in either of the aforementioned difficulties, contact me as soon as possible via e-mail or by phone before the scheduled exam. If you are hospitalized for an extended period contact the Vice President for Student Affairs office at 825-2612; this office is located in the University Center 318F.*

(a) **Standard Exams:** The exams will cover material in the text, handouts, lecture notes, and recommended homework problems. There will be three standard class exams. No exam score will be dropped. Each Exam starts promptly at the beginning of the prescheduled lecture period. Each standard class exam (60 min) will consist of approx. 40 - 45 (max 50) multiple-choice type questions almost evenly distributed from the participating chapters. Exams will be graded promptly and the exam key/answers will be available in my office. If time allows, I will go over parts of the exam during study session. Please do not discard your graded assignments/ quizzes, as you will use them for preparation of the final exam.

(b) **Final Exam:** This exam will cover the entire semester and will be cumulative in nature. The final exam will have questions from each covered chapters. The final exam is not optional, and will consist of approx. 75 - 80 multiple-choice type questions with an evenly distribution of at least 6 questions chosen from each chapter. These questions will be very similar to the assignments and quizzes questions. So, you are strongly encouraged to do all quizzes/assignments seriously, because the exam questions will be similar type, and may be repeated from the given quizzes/assignments.

<table>
<thead>
<tr>
<th>Exam #</th>
<th>Date Room: ST-106</th>
<th>Time (pm) Sec. 002</th>
<th>Time (pm) Sec. 003</th>
<th>(Lecture) Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>Feb 28</td>
<td>12:30-1:45</td>
<td>2:00-3:15</td>
<td>1 - 4</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Apr 03</td>
<td>12:30-1:45</td>
<td>2:00-3:15</td>
<td>5 - 6</td>
</tr>
<tr>
<td>Exam 3</td>
<td>May 01</td>
<td>12:30-1:45</td>
<td>2:00-3:15</td>
<td>7 - 10</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Thu, May 03, 2011</td>
<td>11:00 am-1:30 pm.</td>
<td>Date &amp; Time** Subject to confirmation</td>
<td>All chapters (1 - 10)</td>
</tr>
</tbody>
</table>

**Grades:** **Letter grades will be offered according to the below stated criteria. No Curving!**

<table>
<thead>
<tr>
<th>Overall % criteria for Letter Grade</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% - 100%</td>
<td>A</td>
</tr>
<tr>
<td>75% - 89%</td>
<td>B</td>
</tr>
<tr>
<td>60% - 74%</td>
<td>C</td>
</tr>
<tr>
<td>50% - 59%</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 50%</td>
<td>F</td>
</tr>
</tbody>
</table>

**NOTE: Tentative dates: Either on Thu, May 03 at 2:00 – 4:30 pm OR on Tue, May 08 at 1:45 – 4:15 pm**

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*Texas A&M University-Corpus Christi // Chem 1312 (Sec. 002 & 003) Course Syllabus for Spring 2012 // Kalyan Munshi, Ph.D.*
Exams will be graded promptly and the offered grades are final. In the event you find a tabulation error on your graded exam(s) please bring such a matter to my immediate attention. Your final exam will be kept on file for one academic year. You may examine your class exams and final exam within the confines of my office, but you are not allowed to keep it nor make a photocopy of it. Final letter grades will be given at the conclusion of the semester and are non-negotiable. There is no provision for changing a final letter grade unless there is a tabulation error. You will not be allowed to ask for, nor submit extra credit assignments etc. for the purpose of changing your final grade.

Grade Appeal Process: As stated in University Rule 13.02.99.C2, Student Grade Appeals, 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. If the discussion is not fruitful, a grade appeal may be pursued. For complete details, including the responsibilities of the parties involved in the process and allowed time-frame for completing the process, see TAMU-CC Rules.

Instructor’s Goal: My humble role is to enable you to learn and apply the concepts taught in this class. I would like to see everybody enthusiastic about learning the fundamental concepts of General Chemistry, and ultimately to be successful in this course. I am open for everybody, and would be glad to help you in every sphere of your academic life by interacting individually inside (when possible) and outside of the classroom & lab. However, I can only help you by showing the right direction and effective mode of action for getting success. To explore the right pathway and working effectively is solely your responsibility. If you put your full efforts, and always keep you focused and motivated by extracting the very best of yours, you must succeed in your goals. Please be advised that you will not be able to understand any topic taught later part in the semester without understanding the concepts taught in the beginning of the semester. Therefore, it is strongly suggested that you should talk to your primary instructor about your difficulties at an early stage before you reach to a critical point.

Study Tips & Suggestions:

Do not get behind! It is best to study chemistry on a frequent basis. Ideally you should engage in some form of study daily. While this isn’t always possible, at least you should not compress your study of chemistry into, say, one day! Suppose you’ve decided to study general chemistry on average 10 hours per week. Which would be best, to study Monday through Friday two hours per day, or to study Saturday only from 8:00 a.m. to 6:00 p.m.? You are the best judge to make the answer obvious! You may have an idea of what works best for you. By and large though, most people do much better if they study for shorter periods of time on a frequent basis.

Study all of the worked-out in-chapter and several “recommended problems”. As you read each of the assigned sections you will come across in-chapter problems. Make certain that you go through these thoroughly before moving onto the next section. Chemistry tends to build upon itself; it is difficult to learn new concepts without first mastering prior concepts. As you begin working on the assigned end of chapter problems, do your best to avoid peeking at the solutions manual until you are certain you are correct or you simply have exhausted your efforts. Also, do not assess your efficiency upon how rapidly you are able to read a chapter, but instead assess your success on how well you do at solving problems.
**Write when you study.** If you were taking an art class that dealt with drawing, is it likely that you would increase your proficiency at drawing by simply reading about art? Not likely! Is it possible to learn mathematics by simply reading, or does one have to solve problems him/herself? In my opinion, chemistry is somewhat akin to art and to mathematics. You simply must sketch graphs, structures and formulas over and over to learn chemistry. To read a general chemistry textbook most effectively, it is incumbent upon you to interact with the textbook. This means you must write as you proceed.

**Lecture Notes:** CHEM 1312 lecture notes will be made available to you electronically via class website each week/prior to the beginning of a new chapter. *Sometimes the chapter number(s) in lecture notes may not correspond to the Textbook chapter number(s).* So, with reference to the course content table, please be attentive to the topics covered in the respective lecture chapters with that of the textbook chapters. Please keep the lecture notes in your three-ring binder and have these available during lecture; you may want to have extra loose-leaf paper as well. While notes are important, a good textbook is much more important for in-depth knowledge and full understanding of the study materials.

**Course Tutoring:** The Tutoring Learning Center (TLC) offers free tutoring. You can find information regarding the TLC at: [http://falcon.tamucc.edu/~tlcweb/](http://falcon.tamucc.edu/~tlcweb/). Additional info will be given in lecture periods.

**Reading Assignments, Recommended Problems from Textbook & Practice Problems:** At the very beginning of each lecture, occasionally I’d try my best to list sections you should read from the Textbook, recommended problems for you to solve and information regarding practice problems that are available. You will not be required to turn in answers to recommended problems assigned from the textbook. You are expected to read the assigned portions of each of the chapters thoroughly. In chemistry, the material builds upon itself. You will use concepts presented in the early chapters throughout the entire semester. You cannot simply study chapters to take a test then forget about it. This class requires significant amounts of memorization; however, the extent of memorization part should gradually decrease as you begin to understand and apply the concepts you have already taught. Remember, critical thinking is a powerful tool!

**E-mail Communication:** The Dean and other administrative officials have strongly recommended use of your Islander e-mail ID when electronically communicating with me and other campus offices/personnel.

**Notice to Students with Disabilities:** Texas A&M University-Corpus Christi complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. If you suspect that you may have a disability (physical impairment, learning disability, psychiatric disability, etc.), please contact the Services for Students with Disabilities Office, located in Driftwood 101, at 825-5816. If you need disability accommodations in this class, please see me ASAP.

**Academic Advising:** The College of Science & Technology 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. The College’s Academic Advising Center is located in Driftwood 203E, please dial: 825-3466.

**Last Day to Drop a Class:** Fri, Mar 30. *Before dropping a class, discuss it with your advisor/instructor.*

**Other Info:**

> If you feel that you need to inform / discuss any important information / facts related to your Spring 2012 Exam Schedule / lecture; coincidence of events and/or your health concerns, if any, with your instructor; please feel free to make a confidential discussion prior to any such expected incidents. Failure to comply with this will complicate the situation. Please note that you may receive an ‘F’ grade if you are missing your Final Exam, or absent more than 6 times from your scheduled lecture periods. Please read the following Special Note carefully.
SPECIAL NOTE:

In choosing to take this course, you are agreeing to abide by the course rules, regulations, and standards. This includes agreeing to be respectful to your instructor and fellow students. Conduct that is disruptive or disrespectful will not be tolerated and is grounds for dismissal from the class. Should you have concerns or questions, you are to discuss them with the instructor as soon as possible. However, you are bound by these rules, regulations, and standards from the first day of class through the duration of the course.

Outlines of My Current Undergraduate Research Programs

My research interests and main objectives basically focused on the following three directions:

1) Strategic Design and Designed Syntheses of Antiviral Chemotherapeutics from Triterpenoid-based Natural Products: particularly against influenza, Cancer & HIV-1 replication; including Structure-Activity Relation (SAR) and Evaluation of Bioactivity.
3) Multistep Total Synthesis, Semisynthesis, Characterization and Scale-up Method Developments for several Bioactive Molecules from Birch Bark Extracts. Extraction and Analyses of different Birch Bark Species – introducing the concept of chemical marker

Current research program focused on the triterpene-based bioactive natural products extracted from Birch-bark.

Betulin

Betulin 3-Caffeate

Betulinic Acid

Betulonic Acid

If you are interested in taking participation in this exciting research program, please feel free to contact me.

Texas A&M University-Corpus Christi // Chem 1312 (Sec. 002 & 003) Course Syllabus for Spring 2012 // Kalyan Munshi, Ph.D.