CHEM 1465-002
Chemistry for Engineers
Spring 2018

Instructor: Dr. Rasika Dias

Office: 305 Chemistry Research Building
Office Telephone Number: 817-272-3813
Email Address: dias@uta.edu

Faculty Profile: https://www.uta.edu/profiles/rasika-dias

Office Hours: Tuesday 3:30 pm – 4:30 pm, or immediately after the class, or by appointment

Section Information: CHEM 1465-002

Time and Place of Class Meetings: TuTh 2:00-3.20PM, Science Hall, Room 100

Description of Course Content:
An introduction to important concepts and principles of chemistry with emphasis on areas considered most relevant in an engineering context. Topics include chemical stoichiometry, bonding, chemical thermodynamics, equilibria, electrochemistry, and kinetics. Engineering students may substitute the eight-hour sequence CHEM 1441 and CHEM 1442 for this class, but not either CHEM 1441 or 1442 alone. Students who complete CHEM 1465 and subsequently change majors to curricula that require both CHEM 1441 and CHEM 1442 may substitute CHEM 1465 for CHEM 1441. Prerequisite: high school chemistry and MATH 1323 or concurrent enrollment.

Student Learning Outcomes:
• understand fundamental chemical concepts, including atomic and molecular structure, molecules, materials and different types of bonding, chemical reactions and stoichiometry, the relationship of the electronic structure of elements to the periodic table, intermolecular forces and physical properties of matter, properties of gases, concepts of thermodynamics to predict the spontaneity of processes as well as the changes in free energy, entropy, and enthalpy, chemical equilibrium and its applications, and chemical kinetics.
• perform quantitative calculations related to chemical stoichiometry, the behavior of gases, and enthalpy changes (empirical and quantitative skills)
• learn the scientific process by designing and conducting experiments, collecting and analyzing data, and presenting results, in both written and oral formats (critical thinking, communication)
• learn essential laboratory procedures and protocols (teamwork)
• *Critical Thinking Skills*: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information;
• *Communication Skills*: to include effective development, interpretation and expression of ideas through written, oral and visual communication
• *Empirical and Quantitative Skills***:** to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
• *Teamwork***:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

Text and Required material: Chemistry for Engineering Students; 3rd Ed., Brown & Holme

Lab syllabus will be provided separately

Important Dates For details, refer to University Academic Calendar
March 12-17 Spring vacation

Course Content
An introduction to important concepts and principles of chemistry with emphasis on areas considered most relevant in an engineering context. Topics include chemical stoichiometry, bonding, chemical thermodynamics, equilibria, electrochemistry and kinetics.

The following represents **a tentative schedule** of lecture and examination material for this semester. *The exact dates of the four major exams will be announced in class*.

Week of	**Tentative schedule**
Jan 17	Intro and Ch. 1
Jan 22	Ch. 2 & Ch. 3
Jan 29	Ch. 3 & 4
Feb 5	**Exam I**, Ch. 5
Feb 12	Ch. 5 & Ch. 6
Feb 19	Ch. 6 & Ch. 7
Feb 26	Ch. 7, **Exam II**
Mar 5	Ch. 7 & Ch. 8
Mar 12	***Spring Break***
Mar 19	Ch. 8 & Ch. 9
Mar 26	Ch. 9 & Ch. 10
Apr 2	**Exam III,** Ch. 10
Apr 9	Ch.12
Apr 16	Ch.13
Apr 23	**Exam IV,** Ch.13
Apr 30	Review
May 8	**Final Exam, 2:00-4:30 pm**

***Note:** As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course.

Note also that the Final Exam is scheduled for Tuesday, May 8 from 2:00-4:30 PM by the University. Make sure to save this date because no make-up final exam will be given.

Descriptions of major assignments and examinations:
Four one-hour exams will cover the reading, lecture material, and assigned problems. The final exam will be comprehensive.

The overall grade is based on

Lab Average	25%
Four Exams	13% each
Final Exam	23%

**You must attend the lab and earn at least a 60% in the lab in order to be eligible to pass the course.

Your performance will be evaluated by and course grade determined from the scores received on the four exams, Lab average and the comprehensive final examination according to the grading scale above. **No make-up exams will be given**, and any exams missed exams will result in a grade of zero. However, the **final exam score will replace the lowest one-hour exam score if it is to the student's benefit**. Final exam score will not be replaced.

Letter grade corresponding to the approximate total numerical course grade

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	Below 60%

Homework and Quizzes

Homework assignments will be posted regularly on Blackboard along with Answer keys, but will not be collected or graded. It is very important to work out these problems and test your understanding of the concepts, as emphasized in class.

Exam Needs: You must bring the following to each examination:

Scientific calculator (you may NOT use a graphing calculator or a calculator capable of storing alpha-numeric/textual material).
No. 2 pencils with eraser
ScanTron 4521 (available at UTA Bookstore)
UTA Student ID Card or other valid Government-issued photo ID
Students are not allowed to have access to cell phones, tablets or electronic devices, notes, books, etc. during any exam.
Place all belongings to the side of the classroom. You may not have anything at your feet or under your seat.

General Notes:

1. Please be on time for the class.

2. No food is allowed in the classroom.

3. **Working on laptops/cellphones, texting, etc. are not permitted and cell phones should be on silent mode**.

4. While you are in class, it is incumbent upon you to pay close attention to lectures, discussion, and other in class activities, and to be respectful of your fellow classmates.

5. **Attendance:** At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I will not take attendance. However, faithful attendance is expected (excessive absences will affect your grade). In order to succeed in the course, you must master the material, and this requires active participation. Participation includes advance preparation of reading assignments, working homework problems as well as end-of-chapter problems in the textbook, and involvement with classroom discussions. You are responsible for all of the material covered in the lectures, and the assigned problems. While UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

6. **The Chemistry Clinic** is located in Room 318 Science Hall and will be staffed with tutors available to answer your questions related to lecture and homework. This service is free for all UT-Arlington students enrolled in Chemistry 1465. Unless otherwise posted, the Chemistry Clinic will be open the following hours:

   Monday – Thursday, 9:00 AM – 7:00 PM
   Friday, 9:00 AM – 5:00 PM
   Saturday, 11:00 AM – 4:00 PM

   (Note: The Chemistry Clinic will be closed on any day that the University is closed)

7. **START STRONG Freshman Tutoring Program**
   University Tutorial and Supplemental Instruction (UTSI)/University College

First-year students can receive six FREE hours of tutoring for this course and other selected subjects for this semester. All tutors receive extensive training. Find out more at www.uta.edu/startstrong

8. **Drop Policy:** Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. *After the late registration period, students must see their academic advisor to drop a class or withdraw.* Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/aao/fao/).
   When dropping a course, *you* are responsible for seeing that all of the proper paperwork is completed and submitted to the appropriate university officials. If this paperwork is not completed, you will receive a letter grade corresponding to your earned grade, including zeros for all missed work.

9. **Lab Safety Training: Students registered for this course must complete all required lab safety training prior to entering the lab and undertaking any activities.** Once completed, Lab Safety Training is valid for the remainder of the same academic year (i.e., through the following August) and must be completed anew in subsequent years. There are no exceptions to this University policy. Failure to complete the required training will preclude participation in any lab activities, including those for which a grade is assigned. Instructions for completing lab safety training are given separately in the lab syllabus of this course.

10. **Disability Accommodations:** UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA),* and *Section 504 of the Rehabilitation Act.* All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the **Office for Students with Disabilities (OSD).** Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:
   The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364.
   Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671.

   Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

11. **Title IX:** The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos. For information regarding Title IX, visit uta.edu/titleix.

12. **Academic Integrity:** Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

    I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

    I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

13. **Electronic Communication:** UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

14. **Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit http://www.uta.edu/sfs.

15. **Final Review Week:** A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

16. **Emergency Exit Procedures:** Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located **at the front/back of the room**. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

17. **Student Support Services:** UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

18. **Campus Carry:** Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit http://www.uta.edu/news/info/campus-carry/

19. **Emergency Phone Numbers**: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911.

Chemistry 1465 Laboratory Syllabus
Spring 2018

Lab Coordinator Bill Cleaver wcleaver@uta.edu
Office Hours: Tue & Wed 2:00 – 3:00 in 217 CPB (and by appointment)

Required materials: *CHEM 1465 Lab Manual*, Fourth Edition (green cover) and duplicating page lab notebook, both are available at the UTA Bookstore. Scientific calculator.

Suggested Materials: A Sharpie marker (for glassware marking) may come in handy.

Safety Guidelines: IMPORTANT! You will be exposed to hazardous chemicals in this class. Personal protective equipment (PPE) is necessary to protect your body. You will not be admitted into the lab if any of the following guidelines are not met. If you violate any of the following guidelines, you may be asked to leave the lab. All missed work will receive zero credit.

1. Goggles, gloves and aprons are provided and are required at all times.
2. Shoes that cover the entire foot are required at all times. Absolutely no exceptions will be made to this guideline. Warnings will not be issued.
3. Long pants and sleeves are highly recommended.
4. No musical or other entertainment devices may be used in chemistry lab at any time.
5. Cell phones are not permitted in lab and must be turned off and placed in your bag before you enter lab.

Mandatory Online Safety Training: Students registered for this course must complete the University's required "Lab Safety Training" prior to entering the lab and undertaking any activities. Students should complete the required module as soon as possible, but no later than their first lab meeting. Until all required Lab Safety Training is completed, a student will not be given access to lab facilities, will not be able to participate in any lab activities, and will earn a grade of zero for any uncompleted work.

1. Login to **Blackboard** at https://elearn.uta.edu with your NetID and password.
2. Under **My Blackboard** tab, click **Lab Safety Training.**
3. Click **Welcome** from the left pane to start and follow the instructions.

Once completed, Lab Safety Training is valid for the remainder of the same academic year (i.e. September '17 through August '18) for all UTA courses that include a lab. If a student enrolls in a lab course in a subsequent academic year, he/she must complete the required training again.

General questions about the Lab Safety Training, including content or enrollment should be directed to the Office of Environmental Health and Safety at ehsafety@uta.edu or (817) 272-2185. All technical questions/problems with online training should be directed to the Blackboard Support Center either online or by calling 1-855-308-5542.

Teaching Assistants (TAs): Your TA's office hours will be announced in lab and will be posted outside of 114 and 217 CPB. You may attend the office hours of any 1465 TA.

CHEM 1465 Lab Schedule

Week of:	Lab Schedule
Jan 16-18	No Labs. MLK Day Holiday. Buy the lab manual and notebook in the bookstore.
Jan 22-25	No labs. Complete the online safety training,
Jan 29-Feb 1	Lab Check-in, Lab & Safety orientation.
Feb 5-8	UTA-701: Mass and Volume Measurements
Feb 12-15	UTA-703: Formula of a Copper Oxide
Feb 19-22	UTA-706: The Ideal Gas Law and Gas Constant
Feb 26-Mar 1	UTA-710: Atomic Emission Spectra of Gases
Mar 5-8	UTA-401: Spectrophotometry and Beer's Law
Mar 12-17	No Labs. Spring Break.
Mar 19-22	UTA-402: Molecular Shapes by VSEPR and Solid State Structures
Mar 26-29	UTA-403: Polymers
Apr 2-5	UTA-404: Energy Content of Fuels
Apr 9-12	UTA-707: Hess's Law and Calorimetry
Apr 16-19	UTA-645: Determination of the Equilibrium Constant of a Complex Ion
Apr 23-26	UTA-650: Batteries and Electrolysis.
Apr 30-May 3	Hand in UTA-650 report. Lab Check-Out.
May 7-11	No labs. University Final Exams.

Grading: The lab average, which comprises 25% of the Chemistry 1465 grade, is determined the following way:

Quizzes	30%
Pre-Lab Assignment	20%
Post-Lab Reports	40%
Notebook/Technique	10%

**You must attend the lab and earn at least a 60% in the lab in order to be eligible to pass the course.

- **Quizzes:** There will be a quiz given at the beginning of every lab period. They will cover material and techniques used in experiments preceding and including that day's experiment. The quiz will only be given in the first 10 minutes of the lab period. Missed quizzes cannot be made-up.

- **The Pre-Lab Assignment** is due when you walk through the door. Each pre-lab is worth 100 points. Pre-labs will not be accepted more than 15 minutes after the beginning of the lab. Any student not completing the Pre-Lab assignment will not be permitted to perform that week's experiment.

- **The Post-Lab Report** is due when you walk through the door for the next lab meeting. The post-lab consists of completing all the calculations and answering the questions outlined in the lab manual as well as a one or two paragraph conclusion where you will discuss your experimental results. Each post-lab is worth 100 points. Post-labs are considered late 15 minutes into the lab period and will be assessed a point-penalty of 25 points per day. Reports will not be accepted more than ***two*** days late. Students are responsible for contacting their TA to deliver a late report. Please do not take them to the Chemistry Office or to the Lab Coordinator.

- **The Lab Notebook/Technique:** You will hand in the carbonless copy of your data, signed by your TA, at the end of the lab period. Failure to do so will be counted as a lab absence. Your TA will grade your lab notebook as well as your lab technique during the experiment.

All work, with the exception of computer-generated graphs, must be original and hand-written. Photocopied or computer-generated work will not be accepted.

Your lowest pre-lab grade, post-lab grade and quiz grade will be dropped. If you miss one experiment for any reason it will simply count as the dropped grade. Additional missed labs will receive zero credit. Any zero

resulting from Academic Dishonesty is not eligible to be the lowest grade dropped. Each experiment runs for one week (Mon – Thur) and any conflicts should be addressed to your TA at least a week in advance of the conflict (including observing religious holidays). *There are no makeup labs once the week is over*. Do not turn in a report for an experiment for which you were absent. This is considered cheating and will be addressed as such.

Please be sure to keep all of your graded material through the semester (quizzes, pre-labs and post-labs). If there is any question about your lab grade you will need your original lab reports in order to discuss your grade with the professor or Lab Coordinator. You will lose your option to appeal your lab grade if you do not have your original reports. It is your responsibility to keep all of your reports until the end of the semester. There will never be a circumstance, in which this rule will not apply.

Attendance Policy: The following is from UT-Arlington Undergraduate Catalog's Academic Regulations section

> **Class Attendance**
> Class attendance and lateness regulations will be established by instructors and announced to their classes. At the discretion of the instructor, such regulations may or may not include provisions for making up work missed by the student as a consequence of an absence. Students who are late to class are responsible for reporting their presence to the instructor after the class is dismissed.

Information that stresses safety and technique is disseminated at the beginning of each lab period. Students are expected to be in the lab on time, and they will not be admitted to the lab more than 15 minutes after it begins. All missed work will receive zero credit. These 15 minutes are intended as a grace period for rare instances. It is not intended to become the norm. Abuse of this grace period will result in its cancellation.

You are required to attend lab in the section for which you have registered. Do not go to another lab section.

Academic dishonesty: All students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

Instructors may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Students with Disabilities: Students who need an accommodation based on disability should arrange to meet with the laboratory coordinator during to see that they are appropriately accommodated.

Students with Pregnancies: For students who are pregnant, it is recommended by the Chemistry and Biochemistry Dept. that you do not enroll into a chemistry lab at this time. If you become pregnant during the semester, we recommend dropping the course as soon as possible; and special provisions will be made to assist you in finishing the course at a later date. ***Please see your faculty instructor for assistance.***

If you drop or fail Chemistry 1465, grades earned in the lab cannot be carried over when you re-take Chemistry 1465.