



Course	CHEM 3472-001 / INSTRUMENTAL ANALYSIS
Professor	Dr. Claudia Taenzler
Term	Fall 2013
Meetings	Lecture: Monday & Wednesday 12.00 PM to 1.15 PM in SLC 2.304 Laboratory: Monday & Wednesday 1.15 PM to 3.45 PM in BE 2.330

Professor's Contact Information

Office Phone	972-883-4686
Office Location	SLC 3.505
Lab Location	BE (Berkner Building) 2.330
Email Address	xct080100@utdallas.edu
Office Hours	T and R 12.00 PM to 1.00 PM and by appointment
Other Info:	<u>CHEM 3472 / Section 001 (Mondays & Wednesdays)</u> SLC 2.304 12:00 – 1:15 pm <i>Note: We read only ___@utdallas.edu</i> BE 2.330 1:15 – 3:45 pm <i>Email; We do NOT read WebCT, BlackBoard, or any other blogs.</i>
Rooms & Times & Teaching Assistant	TA: Yu Huang yxh091220@utdallas.edu Nimali Abeykoon nxal24430@utdallas.edu Ferandre Salatan fcs101020@utdallas.edu Office Hour: by appointment Office Hour Location: TBD

General Course Information

Pre-requisites, Co-requisites, & other restrictions	CHEM 2401 (Quantitative Methods in Chemistry)
Course Description	A study of fundamental basis of chemical analysis using different analytical techniques and instrumentation.
Learning Outcomes	<i>Objectives:</i> The goal of this course is to provide students with practical experiences of using modern analytical instrumentation. The course is roughly divided into: (i) spectroscopy; (ii) chromatography; (iii) electrochemistry and surface and microanalysis. Emphasis will be placed upon fundamental principles, data acquisition and analysis, and report writing. <i>Expected Learning Outcomes</i> Students should be able to: 1. Use of standard computational programs, such as Excel 2. Demonstrate the ability to use and explain different analytical concepts 3. Explain the necessity for and use of error estimates and statistical methods 4. Operate at a level of good laboratory practice including safety and cleanliness 5. Implement a professional-level lab notebook 6. Construct professional-level lab reports
Required Materials	<ul style="list-style-type: none"> Recommended: "Principles of Instrumental Analysis, 6th ed." by Skoog, Holler and Crouch Recommended: "Quantitative Chemical Analysis" by Daniel C. Harris "Roaring Springs Composition Book (NB)" Quad. Rules 5 to 1", Bar Code 71072 or 77255, available at UTD Bookstore OR any other location

Schedule & Academic Calendar

<u>Meeting</u>	<u>Date</u>	<u>Lecture Topics</u>
01 M	08/26	Welcome to the World of Instrumental Analysis / Overview / Lab Safety Syllabus, Laboratory Reports / Lab Notebooks
02 W	08/28	Statistics I
03 M	09/02	NO CLASSES
04 W	09/04	Statistics II
05 M	09/09	Introduction to Spectroscopy
06 W	09/11	Components of an Optical Spectrometer
07 M	09/16	Introduction to Optical Atomic Spectroscopy
08 W	09/18	Atomic Absorption and Emission Spectroscopy
09 M	09/23	Introduction to Molecular UV-VIS Spectroscopy
10 W	09/25	Molecular Absorption and Emission Spectroscopy
11 M	09/30	Infrared Absorption
12 W	10/02	Raman Spectroscopy
13 M	10/07	Review Exam 1
14 W	10/09	EXAM 1
15 M	10/14	Introduction to Chromatography
16 W	10/16	Gas Chromatography
17 M	10/21	High Pressure Liquid Chromatography (HPLC)
18 W	10/23	Capillary Electrophoresis
19 M	10/28	Mass Spectrometry
20 W	10/30	Mass Spectrometry
21 M	11/04	Nuclear Magnetic Resonance Spectroscopy
22 W	11/06	Nuclear Magnetic Resonance Spectroscopy
23 M	11/11	Nuclear Magnetic Resonance Spectroscopy / MRI
24 W	11/13	Electrochemistry
25 M	11/18	Electrochemistry
26 W	11/20	EXAM 2
	11/25-11/30	FALL BREAK
27 M	12/02	Dynamic Light Scattering
28 W	12/04	Surface Characterization
29 M	12/09	TEM / SEM
30 W	12/11	Final Exam Review
TBA		Final Exam

Experimental Schedule

<u>Meeting</u>	<u>Date</u>	<u>Laboratory Schedule</u>	<u>Report Due</u>
01 M	08/26		
02 W	08/28		
03 M	09/02		
04 W	09/04		
05 M	09/09		
06 W	09/11		
07 M	09/16	Laboratory # 1	
08 W	09/18	Laboratory # 1	
09 M	09/23	Laboratory # 2	
10 W	09/25	Laboratory # 2	#1: FRIDAY 09-27-2013
11 M	09/30	Laboratory # 3	
12 W	10/02	Laboratory # 3	#2: FRIDAY 10-04-2013
13 M	10/07	Laboratory # 4	
14 W	10/09	Laboratory # 4	#3: FRIDAY 10-11-2013
15 M	10/14	Laboratory # 5	
16 W	10/16	Laboratory # 5	#4: FRIADY 10-18-2013
17 M	10/21	Laboratory # 6	
18 W	10/23	Laboratory # 6	#5: FRIDAY 10-25-2013
19 M	10/28	Laboratory # 7	
20 W	10/30	Laboratory # 7	#6: FRIDAY 11-01-2013
21 M	11/04	Laboratory # 8	
22 W	11/06	Laboratory # 8	#7: FRIDAY 11-08-2013
23 M	11/11	Laboratory # 9	
24 W	11/13	Laboratory # 9	#8: FRIDAY 11-15-2013
25 M	11/18	Laboratory # 10	
26 W	11/20	Laboratory # 10	#9: FRIDAY 11-22-2013
	11/25-11/30	FALL BREAK	
27 M	12/02		
28 W	12/04		#10: FRIDAY 12-06-2013
29 M	12/09		
30 W	12/11		

Course Policies

<p>Laboratory Modules</p>	<p>Number Title</p> <p>L1 UV: UV-VIS absorption spectrophotometry</p> <p>L2 AA: Atomic Absorption</p> <p>L3 Fluorescence</p> <p>L4 Plates: Sampling and Use of Plate Reader (Fluorescence based)</p> <p>L5 Raman: Raman Spectroscopy</p> <p>L6 GC: Gas Chromatography</p> <p>L7 MassSpec: Mass Spectrometry</p> <p>L8 HPLC: High Performance Liquid Chromatography</p> <p>L9 NMR: Nuclear Magnetic Resonance Spectroscopy</p> <p>L10 ISE: Ion Selective Electrode</p>
<p>Safety</p>	<p>IMPORTANT: In accordance with University and Chemistry Department safety rules, any time anyone (student, TA, instructor, or visitor) is in a lab, Z87-rated safety eyewear must be worn. The first violation in the semester will result in a warning and removal from the lab until the safety eyewear is in-place. The second violation in the semester will result in dismissal from that lab period with no extra time being allowed for make-up of the work scheduled for that lab period. Similar penalties will apply if any other safety rules are violated. In summary, all students are responsible for all information inside the undergraduate safety manual; it is located at:</p> <p>www.utdallas.edu/nsm/chemistry/resources/safety.html</p> <p>In addition, please refer to the supplemental handout concerning optical and electrical safety issues.</p>
<p>Lab Reports</p>	<p>Each student will collect data with a laboratory partner.</p> <p>Each student will complete their own Lab Report for all 10 experiments based on the guidelines given during lecture class. The laboratory reports must contain own graphs, own calculations, and own answers to assigned questions. All ten experiments will count towards your grade. Lab reports must be turned in no later than ten days after an experiment is conducted. Data sheets out of your lab notebook must be attached to the final lab report. Lab reports will be collected in a designated box on the second floor of Berkner building (BE 3.502)</p> <p>All laboratory reports must be submitted to your TA by 5 PM on the Friday of the week of the due day for this report.</p> <p>Please refer to the Class Schedule/Calendar for all Lab Report Due Dates.</p> <p>NO E-MAIL SUBMISSION.</p> <p>NOTE: All lab reports received after 5 PM will be penalized at a deduction rate of 5%. Each additional business day a lab report is late will be penalized at an additional deduction rate of 10% per day. Lab reports submitted later than 2 weeks after due date equal a zero (0).</p> <p>If a student does not perform an Experiment, the student will receive zero (0) points for the corresponding Lab Report. NO Make-up of lab periods/experiments missed are scheduled for this class.</p> <ul style="list-style-type: none"> • If you wish to submit an exam or lab report for a re-grade because you believe you lost points unfairly, you must do so within the next class meeting of receiving your quiz, exam, or lab report. • Your entire exam and/or lab report will be re-graded, not just the particular problem you pointed out. • Quizzes will not be re-graded.
<p>Lab NoteBooks</p>	<p>Each student must bring his or her Lab Notebook to UTD every Monday and Wednesday. Each student must keep his or her own neat and orderly Lab Notebook using ink. Please put your name and a date on every Notebook page you use. In addition, be sure to include data labels and units on all tables and graphs. Drawing chemical structures and balanced chemical reactions in your Notebook is highly</p>

	encouraged. Your NoteBook must be signed and dated by your TA (or professor) at the end of any day you spend working in the lab.																						
	Each student will be evaluated with respect to their: adherence to good safety practices, laboratory technical skills, and laboratory etiquette/professionalism. The evaluations will be made by your TA (with the professor) at the end of each experiment.																						
Quizzes	There will be five quizzes throughout this class with emphasis on the different topics taught in class. Quizzes are designed to help students understand the fundamental principles of various analytical techniques and prepare students for the upcoming exams.																						
Exams	There are two exams scheduled throughout the course. Please see schedule for details. A missed exam equates to zero (0) pts. There is a final exam scheduled for this class.																						
Final Exam	<p style="text-align: center;">The Final Exam is Cumulative.</p> <p>There will not be a make-up Final Exam; a missed Final Exam equates to 0 pts. Students must take the Final Exam corresponding to the Section they are enrolled in.</p> <p style="text-align: center;">Section-001 Final = TBA</p> <p style="text-align: center;">It is the student’s responsibility to make sure that they don’t have any Final Exam conflicts with their other exams or any additional conflicts.</p>																						
Grading (credit) Criteria	<p>Distribution of Points:</p> <table><tr><td>Lab Reports & NoteBook Pages</td><td>50%</td></tr><tr><td>Quizzes</td><td>10%</td></tr><tr><td>Exams</td><td>20%</td></tr><tr><td>Cumulative Final</td><td><u>20%</u></td></tr><tr><td>Total</td><td>100%</td></tr></table> <p style="text-align: center;"><i>Quizzes, the Midterm, and The Final will be different for each Section.</i></p> <p>Grade Distribution:</p> <table><tr><td>97 – 100 = A+</td><td>85 – 87 = B+</td><td>76 – 78 = C+</td><td>65 – 68 = D+</td></tr><tr><td>92 – 96 = A</td><td>82 – 84 = B</td><td>73 – 75 = C</td><td>60 – 64 = D</td></tr><tr><td>88 – 91 = A-</td><td>79 – 81 = B-</td><td>69 – 72 = C-</td><td>0 – 59 = F</td></tr></table> <p style="text-align: center;"><i>Sections -001, 002, & -003 are unique courses and are not graded together.</i></p>	Lab Reports & NoteBook Pages	50%	Quizzes	10%	Exams	20%	Cumulative Final	<u>20%</u>	Total	100%	97 – 100 = A+	85 – 87 = B+	76 – 78 = C+	65 – 68 = D+	92 – 96 = A	82 – 84 = B	73 – 75 = C	60 – 64 = D	88 – 91 = A-	79 – 81 = B-	69 – 72 = C-	0 – 59 = F
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88 – 91 = A-	79 – 81 = B-	69 – 72 = C-	0 – 59 = F																				

Make-up Exams	<i>vide supra</i>
Extra Credit	None ☹
Late Work	Lab reports submitted later than 2 weeks after due date equal a zero (0).
Special Assignments	Students are financially responsible for items checked-out ☹.
Field Trip Policies	<i>Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related</i>

Off-Campus Instruction & Course Activities	<p>activities. Information regarding these rules and regulations may be found at the website address http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.</p> <p>None ☹</p>
Technical Support	<p>If you experience any problems with your UTD account you may send an email to: assist@utdallas.edu or call the UTD Computer Helpdesk at 972-883-2911.</p>
Student Conduct and Discipline	<p>The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD printed publication, <i>A to Z Guide</i>, which is provided to all registered students each academic year.</p> <p>The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the <i>Rules and Regulations, Series 50000, Board of Regents, The University of Texas System</i>, and in Title V, Rules on Student Services and Activities of the university's <i>Handbook of Operating Procedures</i>. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391) and online at http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html</p> <p>A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.</p>
Academic Integrity	<p>The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.</p> <p>Scholastic Dishonesty, any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.</p> <p>Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.</p>
Copyright Notice	<p>The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owner's rights and such infringement is subject to</p>

	<p>appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes “fair use” under the Copyright Act. As a UT Dallas student, you are required to follow the institution’s copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see</p> <p>http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm</p>
Email Use	<p>The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student’s U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.</p>
Withdrawal from Class	<p>The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, the instructor(s) cannot drop or withdraw any student. The student must do the proper paperwork to ensure that he/she will not receive a final grade of "F" in a course if he/she chooses not to attend the class once he/she is enrolled.</p>
Student Grievance Procedures	<p>Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university’s <i>Handbook of Operating Procedures</i>.</p> <p>In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called “the respondent”). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent’s School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean’s decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.</p> <p>Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.</p>
Incomplete Grades	<p>As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester’s end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the</p>

	<p>course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.</p>
<p>Student AccessAbility</p>	<p>The goal of Student AccessAbility is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Student AccessAbility is located in room 3.200 in the Student Service Building.</p> <p>The contact information for the Office of Student AccessAbility is: The University of Texas at Dallas Student Services Building 3.200 PO Box 830688 Richardson, Texas 75083-0688 (972) 883-2098 (voice or TTY) disabilityservice@utdallas.edu</p> <p>Office Hours Monday-Thursday 8:30 am - 6 pm Friday 8 am - 5 pm Evenings by appointment</p> <p>If you anticipate issues related to the format or requirements of this course, please meet with the Coordinator of Disability Services. The Coordinator is available to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Services to notify them of your eligibility for reasonable accommodations. Disability Services can then plan how best to coordinate your accommodations.</p> <p>It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.</p>
<p>Religious Holy Days</p>	<p>The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.</p> <p>The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.</p> <p>If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.</p>

These descriptions and timelines are subject to change at the discretion of the Professor.