	Course	CHEM 2401-002 / Quantitative Chemical Analysis ("QCA")
ΠΤΠ	Professor	Paul Pantano, Ph.D. Analytical Chemistry ("Dr. P.")
uip	Term	Spring 2017
	Meetings	Mondays & Wednesdays / 4:00 – 7:45 pm

Professor's Contact Information

110100001 0 00110				
Office Phone	972-883-6226			
Office Location	Berkner Hall (BE) Room 3.506			
Email Address	pantano@utdallas.edu			
Office Hours	TBD			
Other Info: Rooms & Times & Teaching Assistant	CHEM 2401 / Section 002 (Mondays & Wednesdays)SLC 2.3024:00 - 5:15 pmNotes: We read Emails only fromBE 3.1025:15 - 7:45 pm@utdallas.edu senders; and,BE 2.5065:15 - 7:45 pmWe do NOT read WebCT, eLearning/BlackBoard, etc.TA: TA: Justin MillerEmail Address: justin.miller@utdallas.eduOffice Hour: TBDOffice Hour Location: TBD			

General Course Information

Pre-requisites, Co-requisites, & other restrictions	CHEM 1312 and 1112 (General Chemistry II Lecture and Lab).		
Course Description	A study of theories, applications, and calculations involved in methods of analysis, and the practice of volumetric, gravimetric, and spectrophotometric methods.		
Learning Outcomes	 <u>Objectives:</u> This course emphasizes the theory, applications, calculations, and practice involved in volumetric, gravimetric, and spectrophotometric methods of analysis (in other words: "What Analytical Chemists Do"). <u>Expected Learning Outcomes</u> Students should be able to: Solve stoichiometric and other analytical calculations Demonstrate their ability to carry out quantitative volumetric, photometric, and potentiometric determinations Explain the necessity for and use of error estimates and statistical methods Master the use of spreadsheets like Excel Operate at a level of good laboratory practice including safety and cleanliness Implement a professional-level lab notebook 		
Required Materials	 Quantitative Chemical Analysis, 8th or 9th or 10th ed." by Daniel C. Harris <u>http://bcs.whfreeman.com/webpub/chemistry/qca9e/Catalog Resources/QCA9</u> <u>eStudentExperimentsforwebsite29Mar2015.pdf</u> One pad lock (combination or keyed) and a big folder/binder for handouts. "Cold Springs Harbor Research Laboratory Notebook (NB)" This 8.5"x11" NB was chosen since it has <i>carbon-copy pages</i>. 		
Supplemental Material & Info	 Resource Connections from the Office of Undergraduate Education <u>https://oue.utdallas.edu/special-programs/resource-connections/</u> Gen Chem TA Office Hours: visit the Student Success Center for schedules. Please go to the Chem. Dept. Mailroom (BE 2.502) for a list of private <u>tutors</u>. 		

Schedule & Academic Calendar

Meetin	g Date	Lecture and/or Activity	Lab Exp.#	<u># Due Dates</u>
01 M	1/09	Welcome to the World of Analytical Chem	istry / Excel	& Word / Lab Safety
02 W	1/11	Linear Regression / Schedules / Grading	Drawers	
М	1/16	Martin Luther King, Jr. Holiday		
03 W	1/18	Pipette Calibrations / Lab NoteBooks	Calibrate Y	Your Pipettes
04 M	1/23	Buret Calibrations / Lab Reports	Calibrate Y	Your Pipettes
05 W	1/25	Statistics Lectures	Calibrate Y	Your Buret
06 M	1/30	Experiment #6 / Statistics Lectures	Calibrate Y	Your Buret
07 W	2/01	Acids, Bases, Buffers, Titrations	Exp. 6	Buret Graph / Stat Quiz
08 M	2/06	Acids, Bases, Buffers, Titrations	Exp. 6	
09 W	2/08	Lab Reports / Midterm Problems		
10 M	2/13	Acids, Bases, Buffers, Titrations	Exp. 8	
11 W	2/15	More Titrations / Discuss Midterm	Exp. 8	Exp. 6
12 M	2/20	The pH of High-Purity Water	pH meters	
13 W	2/22	Acids, Bases, Buffers, Titrations	Exp. 7	
14 M	2/27	Midterm Reviewage		Exp. 8
15 W	3/01	Midterm Exam		
16 M	3/06	Electrochemistry		Exp. 7
17 W	3/08	Potentiometric Titrations	Exp. 16	
	3/11-19	Spring Breakage		
18 M	3/20	NoteBook Assignment (NBA) Part I	Analytical	Sampling
19 W	3/22	EDTA Titrations	Exp. 12	Exp. 16
20 M	3/27	EDTA Titrations	Exp. 12	NB Pages
21 W	3/29	Spectrophotometry and Calibrations	Exp. 12	
22 M	4/03	Spectrophotometry and Calibrations	Exp. 20	
23 W	4/05	Spectrophotometry and Calibrations	Exp. 20	
24 M	4/10	Analytical Separations	Exp. 27	Exp. 12
25 W	4/12	Analytical Separations		Exp. 27
26 M	4/17	More Spectrophotometry / NBA-II	IA Lab To	ur
27 W	4/19	How Much Caffeine is in Mountain Dew?	Exp. 23	Exp. 20
28 M	4/24	More Calibrations and Course Review	Exp. 23	
29 W	4/26	Final Exam Reviewage	Drawers	
Μ	5/08	Final Exam (5:00 – 7:45 pm CST)		
Tu	5/09	No Lecture / No Lab		Exp. 23 (2:00 pm CST)

Course Policies

Course Policies	
Experiments	Harris Exp # Title 9th Edition PDF Page #
	6. Preparing Standard Acids and Bases 34
	8. Analysis of a Mixture of Carbonate and Bicarbonate 40
	7. Using a pH Electrode for an Acid-Base Titration 37
	16. Potentiometric Halide Titration with Ag^+ 71
	12. EDTA Titration of Ca^{2+} and Mg^{2+} in Natural Waters 58
	20. Spectrophotometric Determination of Iron in Vitamin Tablets 83 27. Demonstring of an Ion Function of Provide ProvideProvide Provide Provide Provide Provide Provide Provide Pr
	27. Properties of an Ion-Exchange Resin 102 22. Supervise A schedule of a Minteres Cofficient & Density A schedule of a Minteres Coffic
	23. Spectrophotometric Analysis of a Mixture: Caffeine & Benzoic Acid 90
	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
Safety	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:
	www.utdallas.edu/nsm/chemistry/resources/safety.html
	In addition, please refer to Dr.P.'s supplemental handout concerning optical and
	electrical safety issues.
	Each student will prepare their own Lab Report for all 8 experiments based on the
	guidelines described in the Dr.P.'s Handout "Writing a Laboratory Report". The Lab
	Report for Exp. 6 will be evaluated but it will not count towards your grade. The
	remaining 7 Lab Reports are each worth 7 pts. Your 6 best Lab Reports will be
	summed for your final Lab Report Score (42 pts. Total).
Lab Reports	Please refer to the Class Schedule/Calendar for all Lab Report Due Dates. Lab
Lub Reports	Reports are due at the beginning of class. Late Lab Reports will be penalized at a
	deduction rate of 21% per week.
	If a student does not perform an Experiment, the student will receive zero (0) points
	for the corresponding Lab Report. Make-up of lab periods/experiments missed (for
	valid medical or emergency reasons) will be attempted based on the availability of the
	apparatus, BE 2.506, and the professor & TA.
	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
Lab NoteBooks	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
	encouraged. Additional tips for keeping a professional NoteBook can be found on
	page 22 of your textbook. 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
Lab Technique	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 (9 pts. Total). If one does not attend, one cannot earn Technique Points.
Quizzes	The majority of Quizzes will be administered after the Midterm Exam and before the
	Cumulative Final Exam. There will not be make-up quizzes; a missed quiz equates to
C. market	zero (0) points. There will also be one Take-Home Statistics Quiz in the first month.
	The Midterm Exam (Wednesday, March 1) will focus on Equilibrium, Acids and
Midterm Exam	Bases, pH and pKa Calculations, Buffers, and Titration Curves. There will not be a
	make-up Midterm Exam; a missed Midterm Exam equates to zero (0) pts. Students
	must take the Midterm corresponding to the Section they are enrolled in.

	The Final Exam is	Cumulative because:		e in Chemistry is Cumulative" ssor Jung, UCLA, 1982.
Final Exam	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.			
	Section-002	Final = Monday,	May 8, 2017	(<u>5</u> :00 – 7:45 pm CST)
	Summary of Poin	ts:		
				<u>Pts.</u>
	I	ab Reports & NoteBo	ook Pages	42
	I	ab Technique.		9
	S	pecial NoteBook Ass	ignment (Exp.1	2) 4
	I	Buret Calibration Grap	bh	4
	Quizzes			6
	Ν	/lidterm Exam		11
	Cumulative Final		24	
				Total 100
Grading (credit)	Quizzes, the Midterm, and The Final will be different for each Section.			
Criteria	Your final letter grade for the course will be determined using a scale such as the one below where the class average is set at the "B-/C+" border (e.g., 79.5 points):			
	A+	97 & above	С	73-76
	A	93-96	C-	70-72
	A-	90-92	D+	67-69
	B+	87-89	D	63-66
	В	83-86	D-	60-62
	B-	80-82	F	59 & below
	C+	77-79		
	Sections -001	& -002 & -003 are uni	ique courses an	d are not graded together.

Make-up Exams	vide supra
Extra Credit	None
Late Work	No assignments will be accepted after the conclusion of "Final Exams Week".
Special Assignments	Students are financially responsible for items checked-out of the stockroom.
Class Attendance and Citizenship	If a student is enrolled in Section-002, that student cannot attend Section-001 or -003 meetings (and vice versa). In addition, it is typical for CHEM-2401 activities to utilize the entire 225 minutes of class time such that students cannot simultaneously enroll in other classes whose meeting days and times conflict with those of the CHEM 2401 section they are enrolled in.
Other Official UT Dallas Policies and Procedures	http://go.utdallas.edu/syllabus-policies
Technical	If you experience any problems with your UTD account you may send an email to:
Support	assist@utdallas.edu or call the UTD Computer Helpdesk at 972-883-2911.

re at in pu ye TI pr	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 nformation 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. 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
Student Conduct and Discipline U of of re m (S A ci R to or or	regulations are available to students in the Office of the Dean of Students, where staff nembers are available to assist students in interpreting the rules and regulations SU 1.602, 972/883-6391) and online at <u>http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html</u> 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 o 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.
Academic Integrity PI fr po ree	The faculty expects from its students a high level of responsibility and academic nonesty. Because the value of an academic degree depends upon the absolute ntegrity 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. 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. 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.
Copyright Notice	The copyright law of the United States (Title 17, United States Code) governs the naking of photocopies or other reproductions of copyrighted materials, including nusic and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owner's rights and such infringement is subject to 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" inder the Copyright Act. As a UT Dallas student, you are required to follow the nstitution's copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm

Email Use	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.
Withdrawal from Class	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.
Student Grievance Procedures	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> . 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 deal 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. 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.
Incomplete Grades	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 course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of $\underline{\mathbf{F}}$.

	The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.
	The University of Texas at Dallas, SU 22 PO Box 830688 Richardson, Texas 75083-0688 (972) 883-2098 (voice or TTY) <u>disabilityservice@utdallas.edu</u>
Disability Services	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.
	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.
	 The Office of Student AccessAbility is committed to ensuring that qualified students with documented disabilities are provided with an equal opportunity to participate in the variety of educational, recreational and social opportunities at UT Dallas. The Office of Student AccessAbility provides: academic accommodations for students with a documented permanent physical, mental or sensory disability non-academic accommodations resource and referral information and advocacy support as necessary and appropriate.
StudentAccessAbility	Student AccessAbility Student Services Building 3.200 Phone: 972-883-2098 Fax: 972-883-6561 disabilityservice@utdallas.edu
	Office Hours Monday-Thursday 8:30 am - 6 pm Friday 8 am - 5 pm Evenings by appointment
	Mailing Address UT Dallas Student AccessAbility 800 W. Campbell Rd., SSB32 Richardson, TX 75083

	Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance. It is the student's responsibility to notify his or her professors of the need for such an accommodation. Student AccessAbility 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.
Religious Holy Days	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. 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.
	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.

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