CHEMISTRY 3240 - ADVANCED PHYSICAL MEASUREMENTS

Dr. Paul Marshall
SPRING 2019

Lecture
12:30 - 1:20 pm Mondays, Chemistry Building Room 253

The first lecture will be on January 14, 2019

Laboratory
Section 301 2:00 - 4:50 pm Thursdays, Chemistry Room 280
Section 302 6:00 - 8:50 pm Wednesdays, Chemistry Room 280
Section 303 2:00 - 4:50 pm Fridays, Chemistry Room 280

A detailed schedule and rotation for the experiments will be provided at the first lecture.

Experiments to be Performed

- #1 Atomic spectroscopy and properties of the hydrogen atom
- #2 Analysis of the spectra of conjugated dyes
- #3 Laser-induced fluorescence and quenching of uranyl ions
- #4 Scanning tunneling microscopy of graphite
- #5 Fourier-transform infra red spectroscopy of HCl and DCl
- #6 Fourier-transform infra red spectroscopy of N₂O and CO₂
- #7 Electronic spectroscopy of I₂
- #8 Inversion of ammonia

You will be given a lecture presentation and supplementary handouts prior to each experiment.

Attendance and Grading Policy

Attendance is required at every lecture and quiz. If you miss a scheduled experiment or quiz you score zero for that experiment or quiz. If you miss a lecture you score zero for that lecture.

Your grade will be based strictly on your laboratory reports, quizzes, lecture attendance and one extended write-up. The lab report is to be turned in as you leave the lab class. Further details about the reports will be provided during Lab Lectures.
Each of the 8 labs is worth 20 points. Calculation of your average lab score for the semester will exclude your lowest lab score. The two quizzes count 15 points each. The extended written lab report counts 20 points. You will receive 2.5 points for attendance at each of the 8 mandatory lectures. Your overall average semester percentage is \((7 \times \text{average lab score} + \text{lecture score} + \text{quiz score} + \text{long write-up score})/2.1\).

Basic scientific calculators that can do \(\ln(x)\), \(\exp(x)\), \(\sin(x)\) and \(\cos(x)\) are recommended for the quizzes. Sophisticated programmable, graphing and so on calculators are not allowed, with the exception of the TI-84 model (because it is required in calculus). Only this model of graphing calculator is permitted, and you must show that the RAM is erased before the start of each quiz. Again, a TI-84 is not required and I actually recommend a ~$10 scientific calculator. Tablets or laptop computers, cell phones, head phones and earbuds are forbidden in exams. Wide-brimmed hats may not be worn.

If your semester average is at least 90% your final grade will be A.
If your semester average is 80-89% your final grade will be B.
If your semester average is 70-79% your final grade will be C.
If your semester average is 60-69% your final grade will be D.
If your semester average is below 60% your final grade will be F.

I reserve the right to give a higher grade than allowed by the above scheme. Any queries about grading must be made within a week of receiving back the graded work.

**Dates**

The first lecture will be on Monday, January 14, 2019. The labs will begin the same week.

There will be no classes on MLK Day, January 21, 2019, and over Spring Break, March 11-15, 2019.

Monday, April 1, 2018 is the last day to drop this course.

**My Office Hours**

Wednesdays 11 am - 2 pm, in Room 274 in the Chemistry Building. You may see me at any time without an appointment; you might want to check ahead that I will be in.

My e-mail is marshall@unt.edu and my telephone number is (940) 565-2294.

**Additional Information**

The information on this page is also available online at [http://www.chem.unt.edu/~marshall/c3240.htm](http://www.chem.unt.edu/~marshall/c3240.htm).
Safety Requirements

The most important safety rule is that you must wear safety goggles or glasses at all times in the lab. Students without safety eyewear will be required to leave.

Familiarize yourself with the safety devices in the lab and their locations (fire extinguisher, fire blanket, eye wash and safety shower).

Do not work in the lab alone or without the supervision of your TA or instructor.

Unauthorized experiments are not allowed.

No eating, drinking or smoking is allowed in the lab.

Material Safety Data Sheets

Under the provision of the Texas Hazardous Communications Act, you have the right to examine Material Safety Data Sheets (MSDSs) which provide essential data for any chemicals you may be using. The MSDSs are available upon request.

ADA STATEMENT The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at disability.unt.edu. You may also contact them by phone at (940) 565-4323.

Legal Notice

My lectures are protected by state common law and federal copyright law. They are my own original expression. Whereas you are authorized to take notes in class thereby creating a derivative work from my lectures, the authorization extends only to making one set of notes for your own personal use and no other use. You are not authorized to record my lectures, to provide your notes to anyone else or to make any commercial use of them without express prior permission from me in writing.

SUCCEED AT UNT UNT endeavors to offer you a high-quality education and to provide a supportive environment to help you learn and grow. And, as a faculty member, I am committed to helping you be successful as a student. Here's how to succeed at UNT: Show up. Find support. Get advised. Be prepared. Get involved. Stay focused. To learn more about campus resources and information on how you can achieve success, go to success.unt.edu
University Policies:

ACADEMIC DISHONESTY Students caught cheating or plagiarizing will receive a "0" for that particular assignment or exam [or specify alternative sanction, such as course failure]. Additionally, the incident will be reported to the Dean of Students, who may impose further penalty. According to the UNT catalog, the term "cheating" includes, but is not limited to: a. use of any unauthorized assistance in taking quizzes, tests, or examinations; b. dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; c. the acquisition, without permission, of tests or other academic material belonging to a faculty or staff member of the university; d. dual submission of a paper or project, or resubmission of a paper or project to a different class without express permission from the instructor(s); or e. any other act designed to give a student an unfair advantage. The term "plagiarism" includes, but is not limited to: a. the knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and b. the knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

ACCEPTABLE STUDENT BEHAVIOR Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at deanofstudents.unt.edu/conduct

ACCESS TO INFORMATION - EAGLE CONNECT Your access point for business and academic services at UNT occurs at my.unt.edu. All official communication from the university will be delivered to your Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward your email: eagleconnect.unt.edu

EMERGENCY NOTIFICATION AND PROCEDURES UNT uses a system called Eagle Alert to notify you quickly with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). The system sends voice messages (and text messages upon permission) to the phones of all active faculty staff, and students. Please make certain to update your phone numbers at my.unt.edu. Some helpful emergency preparedness actions include: 1) know the evacuation routes and severe weather shelter areas in the buildings where your classes are held, 2) determine how you will contact family and friends if phones are temporarily unavailable, and 3) identify where you will go if you need to evacuate the Denton area suddenly.

RETENTION OF STUDENT RECORDS Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. You have a right to view your individual record;
however, information about your records will not be divulged to other individuals without the proper written consent. You are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the university's policy in accordance with those mandates at the following link: essc.unt.edu/registrar/ferpa.html

**STUDENT EVALUATION OF INSTRUCTION** Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. A short survey will be made available at the end of the semester to provide you with an opportunity to evaluate how this course is taught.