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Fall 2018

CHEM 339 - Analytical/Physical Chemistry Lab for Chemical Engineers

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NJIT New Jersey Institute of Technology

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

Phys Chem 235A & Analytical Physical Chem 339

Fall 2018 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Chemistry & Environmental Science (CES) takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description:

This course will offer students an introduction to physical and analytical chemistry laboratory techniques. The application of principles learned in lecture will be reinforced by the experiments done in this lab. They will also provide exposure to analytical and other techniques used in chemistry and chemical engineering.

Number of Credits:
2

Prerequisites:
Chem 236 and Math 225A

Course-Section and Instructors

Course-Section	Instructor	Office Hours
003	Dr. Lev Krasnoperov Room 358, phone x3592 krasnoperov@njit.edu	Office Hours: TBA
001 101	Dr. Elena Avzianova Room 356, phone x3583 Elena.avzianova@njit.edu	Office Hours: TBA

University-wide Withdrawal Date: The last day to withdraw with a **W** is Monday, November 12, 2018. It will be strictly enforced.

Learning outcomes:

Upon the successful completion of this course, the students should be able to:

- Work in a team
- Apply the physical and analytical chemistry principles to the practical laboratory experiments
- Perform accurate quantitative physical measurements

- Analyze data statistically and assess reliability of the results
- Interpret the experimental results, draw conclusions, and communicate effectively through oral and written reports

POLICIES

All students must familiarize themselves with, and adhere to, all official university-wide student policies. We take these policies very seriously and enforce them strictly.

Grading Policy: The total grade in this course will be a composite of your reports, quizzes and oral presentation. The grade of reports in this course will be determined as follows:

Preliminary Experiments (i)	50 pts
Preliminary Experiments (ii)	50 pts
Experiment 15 (theoretical)	50 pts
Experiments 1-14	100 pts
Individual oral presentations	100 pts

LAB REPORT GRADING

SECTION	MAX SCORE
Abstract	5
Introduction/Objective	5
Theory	5
Experimental Procedure	5
Results – Data/Calculation/Plots	30
Results – Interpretation	25
Results – Error Analysis	10
Discussion	10
Lab Notebook teared off sheets with write up.	5
TOTAL	100 pts

Late submission incurs a grade deduction of two points per day. Report which is two weeks past deadline will not be accepted.

Attendance Policy: Attendance at classes will be recorded and is **mandatory**.

- Students are expected to come to the lab on time and in full preparation for the scheduled experiment, and to stay in the lab until the data collection is completed. A tardy will be recorded if you are more than 15 minutes late.

- You will not be allowed to begin your experiment if you are more than 30 min late. In the event of an excused absence, a student is responsible for having the missed experiment made up as soon as possible in another section with the instructor's permission
- A quiz for the scheduled experiment is to be given at the beginning of each lab period. No make-up quiz will be given if it is missed.

Homework policies: Coming prepared

- You must have read and understood the manual for the lab you will be performing.
- A printed copy of the manual must be brought to the lab. Lab Manuals are located on Moodle.
- A pop quiz is to be given to students before the lab. Students who failed the quiz will not be allowed to conduct the experiments.

Safety policies:

- Safety goggles must be worn at all times.
- Only the experiments described in the manual and assigned for specific day may be performed. Talk to instructor and get permission before performing make up experiments in a different lab section.
- If instructor deems a student dangerous to himself/herself and/or others because of lack of preparation or for safety reasons, the student will be asked to leave.
- More information on safety and using various pieces of lab equipment is available on Moodle

General policy: manuals, notebooks, and reports

- Lab manuals are located on Moodle. Students must bring a hard copy of lab procedure to class.
- Students work in groups of two and submit individual reports.
- Groups of three need to perform 1.5 times the number of experiments that groups of two have.
- Students must use a lab notebook to record procedures and data; the notebook should provide a way for a duplicate of records made (e.g., carbon paper or special "Tear Sheet").
- The tear sheet must be presented to instructor for signing after each experiment and turned in along with the lab report.
    - All assignments must be turned in on the due date. Late reports lose two points per day of available points. Reports late by more than 2 weeks will be not accepted.

- All written assignments should be typed, 1.5-spaced, using 12-point font. No handwritten assignments will be accepted.

ADDITIONAL RESOURCES

Chemistry Tutoring Center: Located in the Central King Building, Lower Level, Rm. G12. Hours of operation are Monday – Friday 10:00 am - 6:00 pm. For further information please click here.

Accommodation of Disabilities: **O**ffice of **A**ccessibility **R**esources and **S**ervices (***formerly known as Disability Support Services***) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Chantonette Lyles, Associate Director at the Office of Accessibility Resources and Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Office of Accessibility Resources Services office authorizing your accommodations will be required.

For further information regarding self-identification, the submission of medical documentation and additional support services provided please visit the Accessibility Resources and Services (OARS) website at:

- http://www5.njit.edu/studentsuccess/disability-support-services/

Important Dates (See: Fall 2018 Academic Calendar, Registrar)

Date	Day	Even
September 4, 2018	T	First Day of Classes
September 10, 2018	M	Last Day to Add/Drop Classes
November 12, 2018	M	Last Day to Withdraw
November 22 - 25, 2018	R - Su	Thanksgiving Break - University Closed
December 12, 2018	W	Last Day of Classes

Course outline:

Weeks	EXPERIMENTS	Hard copies of Lab Report(s) due
1	Introduction Preliminary Experiments (i) (ii)	
2	Exp 11 – Conductance of strong and weak electrolytes.	Pre I (due week 2)
3-4	Exp 12 - Potentiometric Titration of an acid mixture. - 1.5 weeks	Pre II (due week 3)
3-4	Exp 13 - Spectrophotometry of a two component	Exp 11 (due week 4)

	mixture. - 1.5 weeks	
5	Exp 14 - Measurement of CO_2 in Ambient Air	Exp 12
6	Exp 15 - Computational Thermochemistry	Exp 13
7-8	Group experiments 1 – 10	Exp 14 (due week 7) Exp 15 (due week 8)
9-10	Group experiments 1 – 10	Exp week 7-8
11-12	Group experiments 1 - 10	Exp week 9-10
13	Make up	Exp week 11-12
14	Oral Presentation	

Selection of experiments is determined by availability of equipment and is at the discretion of the Instructor. Oral presentations are a required component of this lab course. The Oral presentation cannot be on any of the preliminary experiments or experiments 11, 12, and 13.