

Spring 2020

## **CHEM 339-002: Analytical/Physical Chemistry Lab for Chemical Engineers (Revised for Remote Learning)**

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## Phys Chem 235A & Analytical Physical Chem 339

### Spring 2020 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 339: [CHEM 236](#) and [MATH 225A](#)

[CHEM 235A](#): [CHEM 221](#), [CHEM 235](#) with a grade of C or better. Corequisite: [MATH 225](#) (special section for chemical engineering and chemistry majors).

Laboratory experiments apply and extend the basic knowledge of physical chemistry acquired in the lecture. Reports and presentations are an essential part of the course.

#### Course-Section and Instructors

Course-Section	Instructor	Office Hours
002	Dr. Lev Krasnoperov Room 358, phone x3592 krasnoperov@njit.edu	Office Hours: TBA
102	Dr. Larisa Krishtopa Room 216 York, phone x5858 larisa.g.krishtopa@njit.edu	Office Hours: TBA

#### Learning outcomes:

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

- 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
- Work in a team

## **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.**

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

**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	200 pts

## **LAB REPORT GRADING**

<b>SECTION</b>	<b>MAX SCORE</b>
Abstract	5
Introduction/Objective	5
Theory	5
Experimental Procedure	5
Results – Data/Calculation/Plots	30
Results – Interpretation	30
Results – Error Analysis	15
Discussion	5
<b>TOTAL</b>	<b>100 pts</b>

**Zero Tolerance policy is applied. Any occasion of Cheating/Plagiarism will irrevocable lead to an “F” for the course. Additional measures might be imposed as per NJIT Academic Integrity code:**

*“Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:*

*<http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.*

*Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at [dos@njit.edu](mailto:dos@njit.edu)”*

### **Important:**

- Lab manuals are located on Moodle. Students must bring a hard copy of the lab procedure to class and submit to instructor for signature.
- Students work in groups of two and submit individual reports.
- In rare cases a group of three will be formed. Such a group will perform 1.5 times the number of experiments than the groups of two.
- Before starting the lab, each student must present to instructor for signing a tear sheet with student’s name, current date, and title of experiment. At the end of the day, the tear sheet must be presented to instructor for signing again. The tear sheet is to be turned in along with the lab report.
- **All assignments must be turned in by due date (see Moodle page for date information). Late reports lose two points per day. Reports late by more than 2 weeks will be not accepted.**
- All reports must be submitted via Turnitin. Reports submitted by e-mail will not be accepted. No resubmission after due date is allowed! You must attach a legible copy of the tear sheet showing original data with instructor’s signature to the report. Reports without such an attachment will not be accepted! If taking a photograph with a smartphone, it is recommended to use the CAMScanner app to produce a legible copy.
- All electronically submitted reports should be typed, 1.5-spaced, using 12-point font. No handwritten assignments will 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
- All absence must be excused by the Dean of Students office.

### **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 may be given to students before the lab. Students who failed the quiz will not be allowed to conduct the experiments for safety reasons.

### **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

## **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:** Office of Accessibility Resources and Services (*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](mailto: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**

<b>Date</b>	<b>Day</b>	<b>Event</b>
January 21, 2020	T	First Day of Classes
January 21, 2020	F	Last Day to Add/Drop Classes
April 6, 2020	M	Last Day to Withdraw
March 15-22, 2020	S-S	Spring Recess
May 5, 2020	T	Last Day of Classes

### Course outline:

<b>Weeks</b>	<b>EXPERIMENTS</b>	<b>Lab Report(s) due</b>
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 mixture. - 1.5 weeks	Exp 11 (due week 4)
5	Exp 14 - Measurement of CO <sub>2</sub> 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.

*Updated by - 2020*

*Department of Chemistry & Environmental Sciences Course Syllabus, Spring 2020*