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Summer 2019

CHEM 339-011: Analytical Physical Chemistry for Chemical Engineers

Elena Avzianova

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Avzianova, Elena, "CHEM 339-011: Analytical Physical Chemistry for Chemical Engineers" (2019). *Chemistry and Environmental Science Syllabi*. 80.
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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

Summer 2019 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
011	Dr. Elena Avzianova Room 356, phone x3583 Elena.avzianova@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 past deadline will not be accepted.

Attendance at classes will be recorded and is mandatory.

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	30
Results – Error Analysis	15
Discussion	5
TOTAL	100 pts

Zero Tolerance policy is applied. Any occasion of Cheating/Plagiarism will irrevocably 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"*

Laboratory reports due date:

Reports	Due dates:	Submission closed
Pre I, II	27-May	2-Jun
Exp 11	28-May	4-Jun
Exp 12	30-May	6-Jun
Exp 13	4-Jun	8-Jun
Exp 15	6-Jun	10-Jun
Exp 14	10-Jun	13-Jun
Weeks 7 - 8	13-Jun	18-Jun
Weeks 9 - 10	18-Jun	24-Jun
Weeks 11 - 12	24-Jun	26-Jun
Final grades	**Due to**	**27 Jun**

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 laboratory in groups of two. Each student must work on reports independently 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 deadline 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. In the event that a student has a legitimate reason for missing a class, the student should contact the Dean of Students office and present written verifiable proof of the reason for absence.

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, gloves and laboratory coats must be worn at all times.
- No eating or drinking in the lab at any time!
- Always wear covered shoes, long pants, and keep your hair up.
- You must leave your work station clean and in good order before leaving the laboratory.
- Do not lean, hang over or sit on the laboratory tables.
- Singing, dancing, and fooling around or "horse play" in the laboratory is absolutely forbidden. Students found in violation of this safety rule will be barred from participating in future labs.

- 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: **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

May	20	First Summer Session Begins
May	21	100% Refund Ends
May	22	80% Refund Begins
May	22	W Grades Posted for all Withdrawals from First Summer Session
May	27	80% Refund Ends. Memorial Day - No Classes Scheduled. University Closed
May	28	60% Refund Begins
Jun	2	60% Refund Ends
Jun	3	40% Refund Begins
Jun	5	40% Refund Ends
Jun	6	20% Refund Begins
Jun	8	20% Refund Ends
Jun	8	Last day to withdraw from a class in First Summer Session
Jun	27	Final Grades Due

Course outline:

Weeks	EXPERIMENTS
1	Introduction Preliminary Experiments (i) (ii)
2	Exp 11 – Conductance of strong and weak electrolytes.
3-4	Exp 12 - Potentiometric Titration of an acid mixture. - 1.5 weeks
3-4	Exp 13 - Spectrophotometry of a two component mixture. - 1.5 weeks
5	Exp 13
6	Exp 14 - Measurement of CO_2 in Ambient Air Exp 15 - Computational Thermochemistry
7-8	Group experiments 1 – 10
9-10	Group experiments 1 – 10
11-12	Group experiments 1 - 10
13	Make up
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.