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Fall 2021

CHEM 339-103: Analytical/Physical Chemistry Lab for Chemical Engineers

Kathleen Gilbert

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Fall 2021 Chem 339-005, -007, -103

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. *This policy applies to all in-person, online, and remote work submitted by any student, as well as any student enabling another student to cheat or plagiarize.*

COURSE INFORMATION

CHEM 339. Analytical/Physical Chem Lab for Chemical Engineers. 2 credits, 4 contact hours (0;4;0).

Prerequisites: [CHEM 236](#) with grade C or better. Co-requisite: [MATH 225](#) 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.

Instructor: Kathleen Gilbert, Ph.D., P.E.

Contact information: *Email is the best way to contact the Instructor* gilbert@njit.edu

Phone or leave a message at: (973) 642-7938

Office Hours: As posted in Canvas or by appointment by email. *While in-person, you are welcome to stay after class when the Instructor is available.*

Section	Class Times and Room
005	Mondays 11:30am – 3:50pm in Tiernan 208
007	Tuesdays 6 – 10:05pm in Tiernan 208
103	Fridays 1 – 5:20pm in Tiernan 208

University-wide Withdrawal Date: The last day to withdraw with a W is Wednesday, November 10, 2021. It will be strictly enforced.

Absolutely NO Late submissions! Reports which are past the submittal deadline will not be accepted.

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
- Show teamwork and presentation skills

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.

Attendance at classes will be recorded and is mandatory. All students should participate in the hands-on part of each experiment, up to two students working together while two students observe, ask questions or make recommendations, and then students should switch between tasks.

Grading Policy: The total grade in this course will be a composite of your reports, quizzes and oral presentation. It is important to note first that Turnitin will be used for the lab reports and presentation.

Turnitin penalties:

- All orange and red flags will be reviewed individually. Similarity scores of 30% or higher may result in a grade penalty and/or reporting to the Dean of Students office.
- Do NOT copy and paste from any source, including your own lab report from this or a previous semester (if you are repeating) or the lab manual
- There is a Turnitin penalty section for each lab report which could be up to the full point total earned. Minor penalties could be applied.
- Any full grade Turnitin penalty will result in the next Turnitin violation being reported to the Dean of Students office.

Preliminary Experiments (i)	50 pts
Preliminary Experiments (ii)	50 pts
Major experiments (7 total)	7 x 100 pts = 700
Group oral presentations (same for all members)	200 pts
Individual contribution to group presentation	100 pts
Attendance and participation (12 classes)	12 x 25 pts = 300
Each Quiz (8 total)	8 x 50 pts = 400
TOTAL POINTS	1800 pts

LAB REPORT GRADING

(50% of this for the two 50-point lab reports; 200% for the group presentation)

NO LATE LAB REPORTS – each lab report has two weeks to complete except for Prelim. Exp. (i)

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

Important:

- Lab manuals for the experiments are located on Canvas. Bringing a paper copy of the lab to class is recommended. Bring paper to record your data on (no lab notebooks required in Fall 2021).
- Students work in groups of three or four and submit individual reports. Lab class work will be recorded and uploaded individually, but the numbers should match across the group.
- **You must sign in with your group with the TA at the beginning of each in-person class.** If we have any remote sessions, attendance will be taken via WebEx.
- In-person classes will require recording experimental data on a piece of paper with the name, date, experiment number and name, and group members' names to be uploaded. **The TA or instructor MUST sign or initial your data page before you upload it.**
- **All assignments must be turned in by due date. No extra time is provided without a Dean of Students approved excuse and instructor communication.**
- All reports and presentations must be submitted online in Canvas via Turnitin. Reports or presentations submitted by e-mail will not be accepted.
- All submitted reports should be typed, 1.5-spaced, using 12-point font. You must include a copy of your lab class work at the end of your submitted lab report.
- 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 or points will be lost.
- All absences must be excused by the Dean of Students office. Once the excuse is approved, the student must contact the instructor to arrange a make-up lab (either in-person at another section's meeting or online).
- Pre-lab quizzes will be posted for most experiments. They are due before each class starts.

Safety policies:

- Do not wear your lab coat and goggles outside of the lab classroom. Put them on in the desk area when you enter. We advise you keep your lab coat in a separate bag in your backpack.

- Safety goggles must be worn at all times when in the lab area (which is any area except by the desks, including the balance room).
- Only the experiments described in the manual and assigned for specific day may be performed. Make sure to keep track of what Group Experiment your group is doing!
- 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. Remember we are asked to call Public Safety if a student removes their mask or enters without a mask and refuses to put one on.
- More information on safety and using various pieces of lab equipment is available in Canvas.

ADDITIONAL RESOURCES

Chemistry Tutoring Center: The tutoring center may open remotely or in-person for Fall 2021. 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](tel: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/>

NJIT FALL 2021 SCHEDULE

Month	Date	Day	Event
September	1	Wednesday	First Day of Classes
September	6	Monday	NO CLASSES – Labor Day
September	8	Wednesday	Monday classes meet – SECTION 005
September	8	Wednesday	Last Day to Add/Drop a Class
November	10	Wednesday	Last Day to Withdraw from a Class
November	25	Thursday	NO CLASSES – Thanksgiving
November	26	Friday	NO CLASSES – Day after Thanksgiving
December	10	Friday	Last Day of Classes
<i>December</i>	<i>13</i>	<i>Monday</i>	<i>Reading Day 1 (no classes scheduled)</i>
<i>December</i>	<i>14</i>	<i>Tuesday</i>	<i>Reading Day 2 (no classes scheduled)</i>
December	15	Wednesday	Final Exams Begin
December	21	Tuesday	Final Exams End
December	23	Saturday	Final Grades Due

Course Outline (a detailed schedule is available online separately):

Week	Lab Report due	EXPERIMENTS
1	n/a	Introduction, Safety, Prelim. Exp. (i) and (ii)
2	Prelim Exp (i)	Exp 11 - Conductance of strong and weak electrolytes
3	Prelim Exp (ii)	Exp 12 - Potentiometric Titration of an acid mixture
4	Exp 11	Exp 14 - Measurement of CO ₂ in Ambient Air
5	Exp 12	Exp 5 - Acid Dissociation Constant of Methyl Red
6	Exp 14	Three Group Experiments: Each group will complete one of the following for each two-week period: A, B, and C: ----- Exp 1 - Bomb Calorimetry and Heat of Combustion ----- Exp 3 - Vapor Pressure and Enthalpy of Vaporization of a Liquid ----- Exp 4b - Kinetics on Degradation of Organic Pollutants in Wastewater ----- Exp 7 - Oxidation Kinetics of Food Dye Bleaching with Hypochlorite
7	Exp 5	
8	Grp Exp A	
9	n/a	
10	Grp Exp B	
11	n/a	Exp 7 - Oxidation Kinetics of Food Dye Bleaching with Hypochlorite
12	Due 2 days before class	Narrated Group Presentations with Q&A*
13	Grp Exp C	TURN IN LAST LAB REPORT (no class)

*Recorded narrated group presentations will be graded in two parts: the first part is a double value lab report for the slides, and the second part is individual based on Q&A and contribution to the group presentation.

Final notes:

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

Students are responsible to be fully aware of the information in this syllabus at all times during the semester. If you have any questions about material in this syllabus, let the Instructor know as soon as possible via email so they may be answered.

This syllabus may change based on material covered and other factors.

*Updated by Gilbert - 2021
Department of Chemistry & Environmental Sciences Course Syllabus, Fall 2021*