Spring 2019

CHEM 245-002: Organic Chemistry for Chemical Engineers

Yuanwei Zhang

NJIT New Jersey Institute of Technology

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

Chemistry:
Spring 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 offers students the opportunity to learn the nature of carbon in organic compounds. It presents general principles of organic chemistry related to nomenclature, structure, stereochemistry, uses and synthesis.

Number of Credits: 4

Prerequisites: General Chemistry

Course-Section and Instructors

Course-Section	Instructor
CHEM 245	Yuanwei Zhang

Office Hours for All Chemistry & Environmental Science Instructors: Spring 2019 Office Hours and Emails

Required Textbook:

Title	Organic Chemistry for Chemical Engineers
Author	L. G. Wade Jr.
Edition	9th edition
Publisher	Prentice Hall
ISBN #	032197137X

University-wide Withdrawal Date: It will be strictly enforced.

Learning Outcomes: upon completion of the course you should have a facility in the following areas:

1. Interpret 3D representations of molecular structures.

2. Understand the geometry resulting from atomic orbital hybridization.

3. Know how electronegativity and resonance causes charge distribution on molecules

4. Relate geometry and charge distribution to chemical and physical properties

5. Understand how kinetics, thermodynamics and statistical mechanics describe chemical reactions

6. Draw the structures of the products given specific reactants

7. Write the mechanisms of reactions

8. Understand how physical conditions influence rate and path of reactions

9. Use IR, NMR, UV, and MS to determine molecular structure.

POLICIES

All CES students must familiarize themselves with, and adhere to, all official university-wide student policies. CES takes these policies very seriously and enforces them strictly.

Grading Policy: Before each Exam there will be a Quiz, which covers five or six chapters. Take the Quizzes seriously, as they add up to one Exam grade. Problems in the body of the chapter are assigned and selected problems at the end of the chapter. These will not be collected. You have answers to these problems. To do well in the course it is important to do these problems. You must bring a photo ID to the exam and take the exam in the room assigned to you by the course coordinator. Failure to take the exam in the assigned room will result in a loss of a full grade from your exam score.

The grade will be determined from a total of 600 points. Makeup exams are not encouraged. If you must miss an exam contact the coordinator before the exam or immediately after. Makeup should be taken within the first week of the exam and before exams are given back. You must have a valid excuse and a doctor note.

Quizzes	100
Midterm Exam I	100
Midterm Exam II	100
Midterm Exam III	100
Final Exam	200

Your final letter grade in this course will be based on the following tentative curve:

A	90 - 100	**C**	70 - 74.9
B+	85 - 89.9	**D**	60 - 70
B	80 - 84.9	**F**	< 60
C+	75 - 79.9		

Attendance Policy: Attendance at classes will be recorded and is **mandatory**. Each class is a learning experience that cannot be replicated through simply "getting the notes."

Homework Policy: Homework is an expectation of the course. Problems in the body of the chapter are assigned and selected problems at the end of the chapter. These will not be collected. To do well in the course it is important to do these problems.

Exams: There will be three midterm exams held in class during the semester and one comprehensive final exam. The following exam periods are tentative and therefore possibly subject to change:

Midterm Exam I	Feb. 15
Midterm Exam II	March 15
Midterm Exam III	April 12
Final Exam Period	May 16

The final exam will test your knowledge of all the course material taught in the entire course.

Makeup Exam Policy: There will normally be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event that a student has a legitimate reason for missing a quiz or exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the CES Department Office/Instructor that the exam will be missed so that appropriate steps can be taken to make up the grade.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times. Such devices must be stowed in bags during exams or quizzes.

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. 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)

Course Outline

Lecture	Chapter	Topic
1	1	Introduction and Review
2	2	Structure and Properties of Organic Molecules
3	3	Structure and Stereochemistry of Alkanes
4	4	The Study of Chemical Reactions
5	5	Stereochemistry
6	6	Alkyl Halide, Nucleophilic Substitution and Elimination
7	7	Structure and Synthesis of Alkenes
8	8	Reactions of Alkenes
9	9	Alkynes
10	10	Structure and Synthesis of Alcohols
11	11	Reactions of Alcohols
12	12	Infrared Spectroscopy and Mass Spectrometry

13	13	Nuclear magnetic resonance spectroscopy	
14	14	Ethers, epoxides, and sulfides	
15	15	Conjugated systems, orbital symmetry, and ultraviolet	
16	16	Aromatic compounds	
17	17	Reactions of aromatic compounds	
18	18	Ketones and Aldehydes	
19	19	Amines	
20	20	Carboxylic acids	
21	21	Carboxylic acid derivatives	