

Fall 2018

CHEM 245 - Organic Chemistry for Chemical Engineers

Ngozi Onyia

Follow this and additional works at: <https://digitalcommons.njit.edu/chem-syllabi>

Recommended Citation

Onyia, Ngozi, "CHEM 245 - Organic Chemistry for Chemical Engineers" (2018). *Chemistry and Environmental Science Syllabi*. 27. <https://digitalcommons.njit.edu/chem-syllabi/27>

This Syllabus is brought to you for free and open access by the NJIT Syllabi at Digital Commons @ NJIT. It has been accepted for inclusion in Chemistry and Environmental Science Syllabi by an authorized administrator of Digital Commons @ NJIT. For more information, please contact digitalcommons@njit.edu.



Department of Chemistry and Environmental Science

Course Information

CHEM 245.001, Organic Chemistry for Chemical Engineers, 4 credits

Prerequisite: CHEM 126 General Chemistry II

Fall 2018

Class times: Monday, 10.00 AM – 12.05 PM, Thursday 2.30 PM – 4.35 PM

Classroom: Central King Bldg – R 303, Kupfrian Hall – R 209

Instructor Information

Instructor: Dr. Ngozi Onyia

Office Hours: By Appointment

Email: ngozi.m.onyia@njit.edu

Course Description

This course offers a comprehensive introduction to basic modern organic chemistry. Students taking this course will be introduced to the principles of organic structure (alkanes, alkenes, alkynes, alcohols, carbonyl compounds and stereochemistry), and the basic principles of infrared (IR), nuclear magnetic resonance (NMR) and mass spectroscopy. This course will include details on the synthesis and reactions of alcohols, aromatic compounds, aldehydes, ketones amines, carboxylic acids and derivatives and phenols. In addition, the course will include sections on carbohydrates, amino acids and nucleic acids. Organic chemistry is a multifaceted science that is central to other related sciences including biochemistry and medicinal chemistry. This course introduces students to the language and theoretical foundations of organic chemistry.

Course Goals

The primary goal of this course is to provide a comprehensive introduction to the principles of organic chemistry for students majoring in biochemistry, chemistry, biology, and related sciences. On completing this course, students will be expected to demonstrate a comprehensive knowledge of organic chemistry in mid-term and final examinations in the lecture and students will be expected to demonstrate a comprehensive knowledge of organic chemistry laboratory theory, experimental technique and data interpretation in laboratory reports and a final examination in the laboratory.

Students are expected to:

- Demonstrate a general knowledge of the basic area of organic chemistry and have the ability to apply it in a problem solving environment.
- Develop fundamental critical thinking skills, including pattern recognition and analogous reasoning in basic organic chemistry concepts.
- Demonstrate the ability to communicate basic organic chemistry information clearly and precisely, both orally and in writing on examinations and in laboratory reports.
- Have an understanding of the principles and applications of modern instrumentation, computation, experimental design, and data analysis for basic organic chemistry laboratory; be proficient in basic organic chemistry laboratory skills.

Texts, Readings, Materials

- Organic Chemistry, 12th edition by T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder (Required)
- Study Guide/Solution Manual (Recommended)

- Molecular Model (Recommended)

Grading Policy

The final grade for the course will be determined by 3 mid-term exams (60 %) and final exam (40 %).

Remember that you **earn** your grades. Professors do not give you your grades. The grade that you earn in this course will reflect the knowledge you have acquired and your ability to communicate that knowledge. Final grades are not subject to negotiation. Incomplete grades will not be given.

Grade Scale

<u>Letter grade</u>	<u>Average</u>
A	90.0% - 100.0%
B+	85.0% - 89.9%
B	75.0% - 84.9%
C+	73.0% - 74.9%
C	65.0% - 72.9%
D	60.0% - 64.9%
F	0.0% - 59.9%

Procedure And Requirements

Exams: All exams are **closed book**, and students are not allowed to share information in any way. **Photo IDs are required for all exams and will be checked individually in every exam.**

Mid Term Exams: Exams will be given on **Monday October 1, Monday November 5 and Monday December 3** during the normally scheduled class time, starting at **8.30 AM**. These exams will be 75 minutes in duration, and will consist of 20 multiple-choice questions and 5 questions requiring short written answers, possibly including chemical structure drawings and other diagrams, short written explanations, nomenclature or short calculations. These exams will each be worth a maximum of 100 points, with each question worth 4 points, as indicated on the exam. Partial credit may be given for some responses.

Final Exam: The final exam (cumulative) which will be given on **December 15 – 21 (Check Fall 2018 final exam schedule for exact date)**. This exam will be 75 minutes in duration, and will consist of 20 multiple-choice questions and 5 questions requiring short written answers. Each question will be worth 4-6 points, for a maximum score of 100 points. Partial credit may be given for some responses.

Missed Exams: **All exams must be taken at the scheduled times and places.** Students who miss an exam without a legitimate excuse will automatically receive 0 points for that exam. Only students with legitimate excuses (official documents required from Dean of Students) will be allowed to make up missed exams. You must make up a missed exam on December 10 or 12. Exact location and time will be agreed upon by the instructor and the student. **NO EXCEPTIONS!**

Homework: Lecture notes will be posted on **MOODLE**. Daily assignments will be given in lecture. **This is a very demanding course!** You must keep up with the material that is being covered. For review purposes and practice, practice problems, answer keys and exams suggested problems will be posted on **MOODLE**. Homework problems will be assigned for each

chapter. These will not be collected. You have answers to these problems (solution manual). To do well in the course, it is important to do these problems.

Course Schedule

Chapter	Topic
1	Carbon Compounds and Chemical Bonds
2	Representative Compounds, Functional Groups, Intermolecular Forces and Infrared Spectroscopy
3	Organic Reactions, Acids and Bases
4	Alkane Nomenclature, Conformational Analysis and Synthesis
5	Stereochemistry
6	Ionic Reactions
7	Alkenes and Alkynes 1 - Properties and Synthesis
8	Alkenes and Alkynes 2 – Addition Reactions
9	NMR Spectroscopy
10	Radical Reactions
11	Alcohols and Ethers
12	Alcohols From Carbonyl Compounds
13	Conjugated Unsaturated Systems
14	Aromatics Compounds
15	Reactions of Aromatics Compounds
16	Aldehydes and Ketones Derivatives
17	Carboxylic Acid Derivatives
18	Enols and Enolates – Reaction at the Alpha Carbon
19	Condensation and Conjugate Addition
20	Amines (Time Permitting)
21	Phenols and Aryl Halides (Time Permitting)

Attendance Policy

Students must attend all scheduled classes. Attendance is mandatory. An excused absence must be obtained from the instructor. An excused absence will only be granted for verifiable documented reasons of serious illness or family emergency. Lateness will NOT be tolerated. College policy states that students must notify faculty within the first three weeks of the semester if they anticipate missing any classes due to religious observance.

Electronic Forms of Communication

In accordance with College policy, I will use your NJIT email address (@njit.edu) and Moodle to communicate with you about all course-related matters. Please make sure that you check these accounts regularly.

Policy on Academic Integrity

Students are expected to read and understand NJIT's academic integrity policy, which can be found online in the *College Catalog* (<http://www.njit.edu/catalog>). Members of NJIT community are expected to be honest and forthright in their academic endeavors. Students who violate this policy will be referred to the Office of the Provost.

Students with Disabilities

If you need course adaptation or accommodations because of a disability that has been documented

with Disability Support Services, please make an appointment with me. You must be registered with Disability Support Services Fenster Hall Room 260 to receive accommodations. For additional information, contact Disability Support Services at 973-596-5598

Additional Information

Anything with an on/off switch may be a distraction to the instructor and to your classmates and must be turned off or silenced prior to entering the classroom. This includes but is not limited to computers, mp3 players, and phones. Calls should not be made or taken in the classroom. Texting during class is inappropriate. The use of digital recorders (audio, video) is prohibited.

Syllabus Modification

Any modification of this syllabus will be distributed in class and via e-mail.