

**SEWARD COUNTY COMMUNITY COLLEGE
COURSE SYLLABUS**

I. TITLE OF COURSE: CH2615- Organic Chemistry II

II. COURSE DESCRIPTION: 5 credit hours
3 credit hours of lecture and 2 credit hours of lab per week.

Second semester of organic chemistry, with three hours of lecture and six hours of laboratory. A continuation of Chemistry CH 2605. A detail study of alcohols reactions, Infrared spectroscopy, mass spectroscopy, nuclear magnetic resonances, ethers and epoxides reactions, ultraviolet spectroscopy, Aromatic compounds and their reactions.

For each unit of credit, a minimum of three hours per week with one of the hours for class and two hours for studying/preparation outside of class is expected.

Pre-requisite: Pre-requisite: Organic Chemistry I

III. PROGRAM AND/OR DEPARTMENT MISSION STATEMENT:

The Science Program at Seward County Community College provides opportunities to improve and enhance each student's understanding and comprehension of the natural world through a variety of courses and experience to develop a scientifically literate citizen.

IV. TEXTBOOK AND MATERIALS:

1. Wade, L.G. & Simek, J.W. (2017). Organic Chemistry (9th ed.). Glenview, IL: Pearson.
2. Schoffstall, A. M., Gaddis, B. A., & Druelinger, M. L. (2004). Microscale and Miniscale Organic Chemistry Lab Experiments (2nd ed.). New York, NY: McGraw Hill.

V. SCCC OUTCOMES

Students who successfully complete this course will demonstrate the ability to do the following SCCC Outcomes.

- 1: Read with comprehension, be critical of what they read, and apply knowledge gained to real life
- 2: Communicate ideas clearly and proficiently in writing, appropriately adjusting content and arrangement for varying audiences, purposes, and situations.
- 3: Communicate their ideas clearly and proficiently in speaking, appropriately adjusting content and arrangement for varying audiences, purposes, and situations.
- 5: Demonstrate the ability to think critically by gathering facts, generating insights, analyzing data, and evaluating information
- 6: Exhibit skills in information and technological literacy
- 7: Understand each other, moving beyond simple acceptance to embracing and celebrating the rich dimensions of diversity by working as a team to learn, engaging with community, exhibiting cultural awareness, and creating equity.
- 8: Show the ability to contribute to political, civic, and community responsibilities as an informed member of society
- 9: Exhibit workplace skills that include respect for others, teamwork competence, attendance/punctuality, decision making, conflict resolution, truthfulness/honesty, positive attitude, judgment, and responsibility

VI. COURSE OUTCOMES:

General Course Outcomes:

At the completion of this course, the student will:

1. Learn structure, synthesis, and reactions of alcohols.
2. Learn the structure and reactions of aromatic compounds.
3. Learn the structure, synthesis, and reactions of aldehydes and ketones.
4. Read and interpret I.R. spectrum.
5. Interpret NMR spectra and write corresponding formulas.
6. Use and understand principles of UV-visible spectroscopy.
7. Understand principles of gas and liquid chromatography.
8. Study properties of esters and epoxides.
9. Study the structure and stereochemistry of the sugars.
10. Study biochemical cycles.

VII. COURSE OUTLINE:

1. Learn about different reactions of alcohols including, oxidation, addition, reduction, dehydration, hydration, and esterification.
2. Interpret infrared spectra of different molecules.
3. Understand the characteristic absorptions of alcohols, amines, carbonyl compounds, and nitrogen containing compounds.
4. Determine the molecular formula of a compound by mass spectroscopy.
5. Understand the theory of nuclear magnetic resonance spectroscopy (NMR).
6. Interpret Carbon-13 NMR spectra.
7. Draw the structure of a molecule from the NMR spectrum of that compound.
8. Discuss the properties and reactions of ethers and epoxides.
9. Understand the idea of ultraviolet absorption spectroscopy.
10. Learn the properties of aromatic compounds.
11. Know the structures, nomenclature, and properties of ketones and aldehydes.
12. Learn the nomenclature and reactions of amines, carboxylic acids, enols, and enolate ions.
13. Understand the copolymerization process.
14. Write free-radical vinyl polymerization reactions.
15. Synthesize benzoic acid using a Grignard reagent.
16. Synthesize an aldehyde and a ketone compound.
17. Examine Host-Guest chemistry by Friedel-Crafts alkylation of benzene and dimethoxybenzene
18. Synthesize Ferrocene.
19. Use Friedel-Crafts acylation of Ferrocene: Acetylferrocene.
20. Examine the fermentation of sucrose by Biosynthesis of ethanol.
21. Synthesize a chemiluminescent substance.
22. Prepare a dye (orange II) with diazotization of sulfanilic acid.
23. Synthesize Methyl orange as an indicator.
24. Travel to one of the neighboring Universities to check the results of the students synthesis with N.M.R. and I.R. spectroscopy.

VIII. INSTRUCTIONAL METHODS:

1. Lecture
2. Discussions
3. Laboratory Experiments
4. Demonstrations
5. Problem Solving/Help Sessions
6. Field Trip
7. Internet

IX. INSTRUCTIONAL AND RESOURCE MATERIALS:

1. Chemicals
2. Laboratory Equipment
3. Film Slides
4. Audio Cassettes & VCR Tapes
5. IR, UV and NMR Spectra
6. Computer Programs
7. Chemistry Web Sites on the Internet

X. METHODS OF ASSESSMENT:

Methods of assessing the general course outcomes and the specific course competencies include hour examinations, laboratory experiments, laboratory notebook, homework assignments, short quizzes, computer programs, participation in class discussion, final examination.

SCCC Outcome #1 will be assessed and measured by comprehension of text reading assignments, a semester research project, participation in class discussion and through Calibrated Peer Review (CPR) assignments.

SCCC Outcome #2 will be assessed through the student's written CPR essays and semester research papers.

SCCC Outcome #3 will be assessed by the student's expression of ideas through class discussion and oral presentation of a semester research project.

SCCC Outcome #5 will be assessed and measured by lab experiments, a semester research project, CPR assignments, and writing of a laboratory procedure.

SCCC Outcome #6 will be assessed through the use of technology in laboratory experimentation and use of Internet in class work.

SCCC Outcome #7 will be assessed through class discussion, written reports on short research topics throughout the semester, and CPR assignments.

SCCC Outcome #8 will be assessed through class discussion and written reports on the effect of chemicals on ecological systems and how individuals affect the international, federal, state, and local government controls and regulations.

SCCC Outcome #9 will be assessed through class attendance, group participation, and individual ethics used in data collection and research reporting.

XI. ADA STATEMENT:

Under the Americans with Disabilities Act, Seward County Community College will make reasonable accommodations for students with documented disabilities. If you need support or assistance because of a disability, you may be eligible for academic accommodations. Students should identify themselves to the Dean of Students at 620-417-1106 or going to the Student Success Center in the Hobble Academic building, room 149 A.