1. **COURSE TITLE\*:**  Principles of Organic and Biological Chemistry
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*:** CHEM 1124
3. **PREREQUISITE(S)\*:** High school chemistry or CHEM 1120

**COREQUISITE(S)\*:** N/A

1. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
2. **CREDIT HOURS\*:** 5 **LECTURE HOURS\*:** 5

**LABORATORY HOURS\*:** (Lab component) **OBSERVATION HOURS\*:** 0

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

An introduction to organic and biological chemistry, incorporating functional groups and reactions, is followed by the study of biochemicals, including carbohydrates, proteins, lipids, and enzymes. In addition, nucleic acids, protein synthesis, energy, and metabolism will be covered. Desirable for students interested in Allied Health.

1. **LEARNING OUTCOMES\*:**

Upon completion of this course the student should be able to:

1. Identify the characteristic features of organic compounds and employ abbreviated methods for draw organic molecules.
2. Identify, classify, and name saturated and unsaturated hydrocarbons, and study their respective reactions.
3. Define and recognize structural isomers and stereoisomers.
4. Demonstrate an understanding of the structure, properties and reactions of alcohols, aldehydes, ketones, ethers, carboxylic acids, esters, amides, and amines.
5. Identify chiral centers and discern whether a molecule is chiral or achiral.
6. Discuss the structures of carbohydrates and their role in the energy cycle of living organisms.
7. Discuss the structures and functions of fatty acids, steroids along with those of simple and complex lipids.
8. Understand the function of vitamins in metabolism.
9. Identify the structures of amino acids and proteins.
10. Describe the properties of the primary, secondary, tertiary, and quaternary structures of proteins.
11. Explain how enzymes catalyze biochemical reactions.
12. Discuss nucleic acids and describe their role in protein synthesis.
13. Define metabolism and explain the four stages of catabolism.
14. **ADOPTED TEXT(S)\*:**

*General, Organic, & Biological Chemistry*, 6th Edition

By: Janice G. Smith

McGraw-Hill

ISBN: 9781260732030

**LABORATORY:**

In-house book

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.)\*\***

Students are required to purchase laboratory goggles.

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

A: 90 – 100

B: 80 – 89

C: 70 – 79

D: 60 – 69

F: 0 – 59

1. **GRADING PROCEDURES OR ASSESSMENTS:**

|  |  |
| --- | --- |
| Category | % of Grade |
| Homework and Class Activities | 20 |
| Laboratory Activities | 20 |
| Quizzes | 10 |
| Unit Exams (4 Exams, 10% each) | 40 |
| Final Exam | 10 |
| Total | 100 |

1. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

Principles of Organic and Biological Chemistry, a course with a laboratory component, is designed to provide hands-on learning experiences tailored to students in health sciences. Delving into the molecular intricacies relevant to healthcare, students will actively engage in laboratory experiments and simulations aimed at deepening their comprehension of molecular behaviors. Through a dynamic blend of traditional lectures, interactive small group activities, out-of-class assignments, and immersive laboratory exercises, learners will address the course's objectives.

Assessment strategies encompass a multifaceted approach, serving various purposes in evaluating student progress and mastery. From providing ongoing feedback through homework assignments and quizzes to assessing comprehensive understanding through unit exams, students will have ample opportunities to demonstrate their knowledge and skills.

Success in this course hinges on consistent practice and dedication. Regular engagement with practice problems, daily review of notes and textbooks, and proactive utilization of office hours for additional support are strongly encouraged. Memorization alone is insufficient; comprehension, analysis, and application of concepts are essential for success in this health-focused chemistry course. Therefore, consistent engagement with the material throughout the term is encouraged for optimal learning outcomes.

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

***(Insert sample course outline with learning objectives tied to assignments / topics.)***

|  |  |  |  |
| --- | --- | --- | --- |
| Week | Content Covered | Exams and Labs | LOs |
| 1 | Introduction to organic molecules | Lab Safety | 1,8 |
| 2 | Functional groups | Recrystallization | 1,8 |
| 3 | Alkanes | Chromatography | 1,2,3 |
| 4 | Unsaturated Hydrocarbons | Unit 1 Exam | 1,2,3 |
| 5 | Structure and properties of alcohols, aldehydes, and ketones | Organic Models | 1,4 |
| 6 | Structure and properties of ethers, carboxylic acids, esters, amides, and amines | Functional groups | 1,4 |
| 7 | The study of isomers, chirality, and their vital roles in medicine. | Alcohols | 1,5,8 |
| 8 | Aldehydes and Ketones and their role in the human body | Synthesis of esters | 1,4 |
| 9 | Carboxylic Acids, Esters, and Amines | Unit 2 Exam | 1,6 |
| 10 | Lipids and Vitamins and steroids | Carbohydrates | 7,8 |
| 11 | Carbohydrates and their role in the energy cycle of living organisms | Unit 3 Exam | 5,6 |
| 12 | Structure and classification of amino acids and proteins | Lipids | 5,9,10 |
| 13 | Enzymes and their role in the biochemicals reactions | Proteins | 5,9,10,11 |
| 14 | Nucleic acids and protein synthesis | Unit 4 Exam | 12 |
| 15 | Metabolism and Energy production |  | 13 |
| 16 | Final Exam |  | 1-13 |

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

* Students may not use programmable calculators or cell phone calculators during exams.
* Please understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. There is also a possibility that your papers may be submitted electronically to other entities, for reasons such as for plagiarism checks.
* ACADEMIC MISCONDUCT: Any student who commits any type of academic misconduct as stated in the current college catalogue will receive an "F" for the exam, quiz, or evaluated project.

**16. FERPA: \***

Students need to understand that their work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**17. ACCOMODATIONS: \***

Students requesting accommodations may contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431, X 2604.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires an accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first. For more information about Religious Accommodations, contact Ryan Hall, Accessibility Coordinator at [rhall21@sscc.edu](mailto:rhall21@sscc.edu) or 937-393-3431 X 2604.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.