

PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

BASIC ORGANIC & BIOCHEMISTRY
CHEM 1020

Class Hours: 3.0

Laboratory Hours: 3.0

Credit Hours: 4.0

Date Revised: Spring 2017

Catalog Course Description

Organic chemistry: alkanes and unsaturated and aromatic hydrocarbons, with emphasis on structure, nomenclature, and functional groups. Biochemistry: amino acids and proteins, carbohydrates, lipids, nucleic acids. Course includes three hours of lecture and three hours of laboratory applications each week.

Prerequisites

CHEM 1010

Textbook(s) and Other Course Materials (required)

Dennison, K. J. Topping, J. J., Woodrum, K. R. and Caret, A. L. *General, Organic and Biochemistry*. 8th edition. MacGraw Hill, 2014.

Additional Aids (optional)

HGS Molecular Models: Organic Chemistry (sold in PSCC Bookstore or maybe ordered from Sigma-Aldrich Z277703-1EA)

D2L

Important course materials will be posted on D2L or may be sent by email. Check these **daily**. Note outlines, supplemental material and practice problems will be posted on D2L. It is the student's responsibility to print these assignments and bring them to class. Laboratory procedures will also be posted on D2L. Make sure that you can access both D2L and webmail through the PSCC homepage before you leave campus today. If you have difficulty please call the helpdesk (694-6537) or go to the open computer lab located on the third floor of the ERC.

Week/Unit/Topic Basis

Week	Chapter	Topic
1	10	An Introduction to Organic Chemistry: The Saturated Hydrocarbons
2	11	The Unsaturated Hydrocarbons: Alkenes, Alkynes and Aromatics
3	12	Alcohols, Phenols, Thiols and Ethers
4	13	Aldehydes and Ketones
5	13	continued
6	14	Carboxylic Acids and Carboxylic Acid Derivatives
7	15	Amines and Amides
8	16	Carbohydrates
9	17	Lipids and their Functions in Biochemical Systems

10	17	continued
11	18	Protein Structure and Function
12	19	Enzymes
13	20	Introduction to Molecular Genetics
14	20	continued
15		Final Exam

Course Goals

NOTE: Roman Numerals after Course Goals reference TBR General Education Goals.

The course will

- A. Understand molecular structure and chemical bonding in carbon containing molecules. V.4
- B. Develop a working knowledge of IUPAC as well as common nomenclature for organic compounds. V.4
- C. Develop a deeper understanding of the Lewis and Bronsted-Lowry definitions for acids and bases and their essential role in organic and biological chemistry. V.1, V.2, V.4
- D. Understand the difference between constitutional and stereo isomerism and the importance of chirality in biological systems. V.1, V.2, V.3, V.4
- E. Acquire knowledge of the reactivity of various functional groups including alkyl halides, alcohol, alkenes and alkynes as well as methods for preparation of these functional groups. V.4
- F. Acquire knowledge of the structures of biological molecules including carbohydrates, lipids, proteins and nucleic acids and their roles in metabolic and regulatory biochemical pathways. V.1, V.4
- G. Understand the factors affecting enzyme activity and the mechanism of enzyme activity. V.4
- H. Understand the roles of RNA and DNA in protein synthesis. V.4
- I. Acquire knowledge of the types of molecules used for communication between cells: neurotransmitters and hormones.
- J. Exhibit critical thinking skills. V
- K. Learn skills related to observing, measuring, analyzing, evaluating and communicating scientific data. I, V, VI

Expected Student Learning Outcomes

NOTE: Capital letters after Expected Student Learning Outcomes reference the course goals listed above.

The student will

1. Name organic structures using IUPAC rules including stereochemistry as well as draw structures for given names including appropriate stereochemistry. B, D
2. Identify functional groups. E

3. Determine the products for a variety of reactions involving alkanes, alkenes, alkynes, aromatic hydrocarbons, alcohols, ethers, aldehydes, ketones, carboxylic acids, esters, amines, and amides based on examples and reaction mechanisms discussed in class. E
4. Determine the reagents necessary to accomplish chemical transformations of the functional groups studied. E
5. Draw and identify structures for important biological molecules including proteins, carbohydrates, lipids and nucleic acids. F
6. Determine the effects of pH change on the ionization of amino acids and proteins. F
7. Discuss the factors affecting enzyme activity. G
8. Know the steps in DNA replication, transcription and translation. H
9. Know the structural characteristics of classes of neurotransmitters and hormones involved in chemical communication and the mode of action. I
10. Collect, tabulate, graph and analyze data from laboratory experiments J, K
11. In learning the nomenclature and properties of different classes of organic compounds, students will have a better understanding of the chemistry involved in producing the products, both natural and man-made, that they use on a daily basis. These products include soaps and detergents, cosmetics, plastics, pesticides, fabrics, pharmaceuticals and many others. J

Evaluation

Testing Procedures: 75% of grade

Exams, in-class assignments and/or homework will be worth a total of 750 points. The final exam is MANDATORY. If the final exam is not completed a grade of an "F" will be assigned in the course.

Molecular models are allowed on all exams. Other applicable materials will be provided during the exam. All cell phones and other devices should be turned OFF before the exam begins.

Missed exams may not be made up for any but the most serious personal or family crisis. The instructor must be notified within 24 hours of the scheduled exam time.

Documentation is required. In all other cases missed exams will be recorded as a zero. Students arriving late for an exam will not be given extra time.

In addition the instructor may at their discretion give weekly graded homework assignments and/or quizzes. Quizzes and/or homework assignments may not be made up.

Laboratory Expectations: 25% of grade

Laboratory Reports, Problem Sets, and laboratory final will be worth a total of 250 points.

Attendance is required for all scheduled lab meetings. Students arriving late will not be permitted to perform the lab. If there are multiple incidences of tardiness students may lose points at the instructor's discretion. Any missed labs due to unexcused absences will be counted as a zero. Any lab experiments or problem sets missed due to an excused

absence may only be made up with permission from the instructor.

Students should dress appropriately for the laboratory. Shoes covering the entire foot are required (no clogs/sandals/ballet flats). Legs must be fully covered (no tights/leggings/yoga pants). Safety eye wear must be worn during laboratory experiments. Additional dress requirements as well as safety rules will be discussed during the first lab meeting. Students who are not appropriately attired for subsequent lab meetings will not be allowed to complete the lab assignment and will receive a zero.

Students must read the assignments prior to the laboratory meeting. Pre-lab assignments must be completed prior to the lab meeting. Laboratory reports are due after completion of the laboratory assignment.

Grading Scale

The course grade will be based on the following:

	Points
Lecture	750
Laboratory	250
Total	1000

The grading scale will be as follows:

Points	Grade
900-1000	A
875-899	B+
800-874	B
775-799	C+
700-774	C
600-699	D
Below 600	F

Policies

Attendance Policy

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

Academic Dishonesty

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

Accommodations for Disabilities

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course.

[Disability Services](http://www.pstcc.edu/sswd/) (<http://www.pstcc.edu/sswd/>) may be contacted via [Disability Services email](#) or by visiting Alexander 130.

Classroom Disruptions

Classroom disruptions during lecture or laboratory, any form of communication during testing or any other form of behavior that may prove distracting to others will not be tolerated. Unacceptable behavior for the classroom includes but is not limited to: (1) use of a cell phone for either conversation or texting, (2) talking during lecture for any purpose other than asking or answering a question from the instructor, (3) eating during lecture or lab, (4) inappropriate use of a laptop and/or (5) arriving late or leaving early.