PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

GENERAL BIOLOGY I
BIOL 1110

Class Hours 3.0 **Credit Hours: 4.0**

Laboratory Hours: 2.0 **Revised: Fall 2016**

Catalog Course Description

Chemical basis of life; cell structure and function including energy metabolism; cell division; DNA and gene regulation; Mendelian and molecular genetics; evolution. Course includes three hours of lecture and two hours of laboratory applications each week.

Prerequisites and or Co-requisites:

Students enrolled in lecture must be registered for the co-requisite laboratory during the same semester.

Textbook(s) and Other Course Materials

Biology. 10th edition. Raven, Peter; Johnson, George; Mason, Kenneth; Losos, Jonathan; Singer, Susan. McGraw Hill. 2014. The text is required. Volume I of this textbook will be used for Biology 1110 and Volume II will be used for Biology 1120. Custom volumes in the Pellissippi State Bookstore include a 6 month access code to *Connect (***some faculty may require *Connect* assignments***)*, or students may purchase directly from their instructor's e-learn site.

General Biology 1110 Laboratory Manual. 4th edition. Hayden-McNeil Publishing. This laboratory manual is a custom publication for Pellissippi State. The lab manual is required and will be used for each lab exercise. You will be required to record data in the manual and submit pages from the manual to your instructor for grading.

I. Week/Unit/Topic

Week of	Learning Activities
1	**Unit I: Molecules of Life** Lecture: Chapter 1: The Science of Biology Lab: Microscopy, Exercise 1
2	Lecture: Chapter 2: The Nature of Molecules and the Properties of Water Chapter 3: Chemical Building Blocks of Life Lab: Organic Molecules, Exercise 2
3	Lecture: Chapter 3: Chemical Building Blocks of Life, cont. Chapter 6: Energy and Metabolism Lab: Protein Structure; Enzymes and Metabolic Rates Exercise 3a and 3b **Test or Tests from Unit I (chapters 1, 2, 3, 6) 100 points**
4	**Begin Unit II**: **Cells and Energy Exchange**

Week of	Learning Activities
	Lecture: Chapter 4: Cell Structure Chapter 5: Membranes Lab: Cell Structure and Membrane Function. Exercise 4
5	Lecture: *Selected material* from Chapter 9: Cell Communication*, Chapter 8: Photosynthesis. Lab: Photosynthesis. Exercise 5
6	Lecture: Chapter 8: Photosynthesis cont. and Chapter 7 : How Cells Harvest Energy Lab: Fermentation and Aerobic Cellular Respiration. Exercise 6 **Test or Tests from Unit II (chapters 4, 5, 7, 8, *9*)* 100 points**
7	**Begin Unit III**: **DNA, Protein Synthesis and Viruses** Lecture: Chapter 14: DNA: The Genetic Material Chapter 15: Genes and How They Work Lab: Laboratory Practical I
8	Lecture: Chapter 15: Genes and How They Work cont. *Selected material* from chapters 16-17-18* Lab: NO LAB
9	Lecture: Chapter 27: Viruses **Test from Unit III (chapters 14, 15, *16-18** 27) 100 pts** **Begin Unit IV: Cell Division and Genetics,** Chapter 10: How Cells Divide Lab: RFLP DNA Fingerprinting and The Structure of DNA Exercise 7a and 7b
10	Unit IV cont. Mitosis, Meiosis and Genetics Lecture: Chapter 11: Sexual Reproduction and Meiosis. Lab: Cell Division: Mitosis and Meiosis, Exercise 8
11	Lecture: Chapter 12: Patterns of Inheritance Lab: Inheritance of a Single Trait. Exercise 9
12	Lecture: Chapter 13: Chromosomes, Mapping, and the Meiosis-Inheritance Connection. **Test or Tests from Unit IV (chapters 10, 11, 12, 13) 100 points** **Begin Unit V: Evolution** Lecture: Chapter 20: Genes Within Populations Lab: Inheritance of Two Traits. Exercise 10
13	Lecture: Chapter 21: The Evidence for Evolution Chapter 22: The Origin of Species Lab: Population Genetics and Evolution, Exercise 11
14	Lecture: Chapter 26: The Origin and Diversity of Life and *Selected material* from Chapters 23-25* Lab: Laboratory Practical II **Test or Tests from Unit V (chapters 20, 21, 22, 26, *23-25*)* 100 points**
	Comprehensive Final Exams are to be administered in classes. **Please see the final exam schedule from the A-Z index at www.pstcc.edu**

***Instructors may cover additional content from selected chapters.**

II. Course Goals

A. This course will expand student understanding of the basic unit of life (the cell), the cells complexity and diversity, and the relationship of structure and function of cell organelles. V.3, V.
B. This course will extend student understanding of the basic principles of heredity and how they relate to inheritance of traits in humans. V.3, V.4
C. This course will guide students toward understanding the structure and function of DNA as a repository of genetic information, transmission of this information, and how mutations of the DNA affect cellular function. IV.5, V.3, V.4, V.5
D. This course will expand student understanding of how natural selection, mutations, genetic drift, migration and non-random mating affect the frequency of genes from generation to generation (evolution). V.3, V.4, V.5, VI.4
E. This course will enhance student knowledge of the importance of biological cycles and the interdependence that results from these cycles (i.e. the carbon cycle: autotrophs, heterotrophs, autotrophs). V.3, V.4
F. This course will guide students toward enhanced critical thinking skills. I.I, V
G. This course will enhance effective use of process skills related to scientific experimentation, including: observing, measuring, classifying, communicating and inferring.VI.6, V.1, V.2
H. This course will guide students toward effective interpretation of biological information and evaluation of its validity. I.1, I.6, I.7, V.1, V.2, V.3, VII.

*Roman numerals after course objectives reference goals of the Biology program. (Career Program Goals and General Education Goals are listed: General Education

III. Expected Student Learning Outcomes

The student will be able to:

a. Classify organisms into one of the Domains and Kingdoms of living things based on characteristics such as cell type, cell number, and means of nutrition. A, F, G
b. Identify the structure and reactivity of the atom related to bonding and the formation of biological compounds. A, F
c. Describe the four classes of organic compounds. A, F, G
d. Describe the structure and function of parts of the eukaryotic cell. A
e. Compare and contrast photosynthesis and cellular respiration. E
f. Describe the structure of DNA. C, F
g. Describe the role of DNA in protein synthesis and cellular control. C, F, H
h. Recall the key events in the discovery of DNA as the basis of heredity. C, F
i. Work standard Mendelian genetics problems. B, F
j. Work problems with multiple alleles and sex-linked traits. B, F
k. Explain the main bodies of evidence which support evolution. D, F, H
l. Explain the mechanisms by which evolution occurs. D, F, H
m. Use dichotomous keys to identify unknown organisms and report data using graphs. G, F, H

n. Locate biologically related material in the ERC and on the WWW. Evaluate biological information. H, F
o. Interpret and draw conclusions from graphically presented data. G, F

*Letters after performance expectations reference the course objectives listed above.

IV. Evaluation

a. Lecture Section expectations: 75% of grade
Each lecture unit will be evaluated using one or more tests totaling 100 points. Exams will be a mix of discussion questions and objective questions. There are no makeup lecture tests. There will be a **mandatory** comprehensive final for the course worth 100 points. Failure to take the comprehensive final will forfeit any bonus points earned during the semester. The comprehensive final may be used to take the place of one missed exam if there is documented evidence of a valid and reasonable excuse. The comprehensive final exam score may also be used to replace the lowest unit exam score if all exams were attempted. The additional 75 points associated with lecture will be earned by doing a variety of activities determined by your instructor.

Students will receive one grade for General Biology 1110. The total number of points on which your grade will be based is 900. In lecture, you may earn as many as 675 points, which constitutes 75% of the grade. In lab, you may earn as many as 225 points, which constitutes 25% of the grade.

b. Laboratory Expectations: 25% of grade
- Students are expected to go to the appropriate laboratory for which they are enrolled and complete the assignments in a timely manner. Laboratory work will not be accepted late, and you must have attended the lab for which you are submitting work.
- Students are expected to dress appropriately for the laboratory to minimize risk to personal safety. No open-toed shoes are allowed, and garments that cover the legs are recommended. Students are required to report to their laboratory instructor any concern for personal safety or injury sustained during various exercises.
- Students are encouraged to work cooperatively together to complete the exercises in a timely fashion but not to plagiarize lab work nor communicate during the practical. During and after each lab exercise, students are required to complete the post-laboratory report. These post-laboratory reports will be collected and graded on 5 randomly selected dates. Each graded set of post laboratory report questions will be worth 12 points**.**
- Post-laboratory reports will not be accepted late**.**
- Students are required to read the scheduled lab exercise before coming to class.
- Students will write a formal scientific paper dealing with a lab exercise selected by the instructor. The report will include an introduction, methods and materials, results, conclusion, and bibliography. A draft version of the formal report must be turned in by the date selected by the instructor**.** The draft must have text information in ALL 5 sections, data, references, and be typed. The instructor will not grade the draft, but will make suggestions for improvement to be incorporated into the final paper. The final laboratory report will be due on a date selected by the instructor and is worth 40

points. Failure to turn in a draft version will reduce the possible points that can be earned for the paper from 40 to 30.

- Drinks, food, gum, and tobacco products are prohibited in the classroom or laboratory.

c. Field Work

Students may be required to read supplemental articles or papers on reserve in the library

d. Grading Scale

A	90-100% (810-900 points)
B+	87-89% (783-809 points)
B	80-86% (720-782 points)
C+	77-79% (693-719 points)
C	70-76% (630-692 points)
D	60-69% (540-629 points)
F	0-59% (0-539 points)

Point Distribution: Lecture tests and assignments (675 total)

Unit 1	100 points
Unit 2	100 points
Unit 3	100 points
Unit 4	100 points
Unit 5	100 points
Assignments	75 points
Final exam	100 points

Point Distribution: Laboratory (225 total)

Post Laboratory Reports	60 points (5X12)
Formal Scientific Paper	40 points
Midterm Laboratory Practical	40 points
Final Laboratory Practical	40 points
Assignments and Quizzes	45 points

V. Policies

a. 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. 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. Consistent tardiness and excessive absenteeism may lower the final grade.

b. 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.

c. 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 Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Accommodation plans are not retroactive. Disability Services (http://www.pstcc.edu/sswd/) may be contacted via email or by visiting Alexander 130.

d. Other Policies:

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 and may lower the final grade and/or result in removal from the course. Cell phones must be in the off or vibrate mode and should not be visible during class time. Students are expected to work on biology related materials and participate in meaningful discussion where time permits. Visitors are not allowed in the classroom or the laboratory.

Laboratory Substitution Policy

There may be a time during the semester that you will not be able to attend your regularly scheduled laboratory section. Since attendance is so critical to your laboratory grade, we do have a policy that will allow you to attend an alternate lab section **ONE** time during the semester if lab sections are available. Lab substitution is only allowed in the case of an emergency and with adequate approval. You must inform your regular instructor, and obtain permission and documentation from the substituting instructor showing that you attended an alternate lab.