Class Hours: 3.0  Credit Hours: 4.0
Laboratory Hours: 2.0  Date Revised: Spring 00

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.

Entry Level Standards:
Must be eligible for enrollment in English 1010 and DSM 0840 or higher

Prerequisite:
Students enrolled in lecture must be registered for the corequisite laboratory during the same semester.

Textbook(s) and Other Reference Materials Basic to the Course:

Required Materials:
Biology: Life on Earth. Fifth edition. Gerald and Teresa Audesirk. Prentice-Hall, Inc. 1998. The text is required, and the student should take the text to each lecture and laboratory session. This textbook will be used for both Biology 1010 and Biology 1020.

Laboratory Manual for Starr's Biology Concepts and Applications. James W. Perry and David Morton. Wadsworth Publishing, 1995. The laboratory manual is required. Periodically, pages from the manual will be collected and graded. Xeroxed copies will not be accepted. This laboratory manual will be used for both Biology 1010 and Biology 1020.

Optional Materials:
A study guide to accompany the textbook is available at the bookstore. It is not required, and will not be referred to in class. However, many students find it helpful. New books are sold with the study guide and a guide for using the Internet.

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>An Introduction to Life on Earth</td>
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<tr>
<td>2</td>
<td>An Introduction to Life on Earth; Atoms and Molecules</td>
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</tbody>
</table>
Atoms and Molecules; Biological Molecules

Biological Molecules; Energy Flow; Test or Tests from Unit 1 (chapters 1-4)

Cell Membrane Structure/Function

Cell Structure and Function

Photosynthesis; Test or Tests from Unit II (chapters 5-7)

Glycolysis and Respiration

DNA: The Molecule of Heredity

Gene Regulation and Expression; Biotechnology; Test or Tests from Unit III (chapters 8,9,10,13)

Cellular Reproduction

Cellular Reproduction; Patterns of Inheritance

Patterns of Inheritance; Test or Tests from Unit IV (chapters 11-12)

Principles of Evolution

How Organisms Evolve

The History of Life on Earth; Final Exam Period

II. Course Objectives*:

A. Develop an understanding of the basic unit of life (the cell), and its complexity and diversity. II

B. Develop an understanding of the basic principles of heredity and how they relate to inheritance of traits in humans. I, II, IV, V

C. Develop an understanding of the structure and function of DNA as a repository of genetic information and how mutations of the DNA affect cellular function. I, II, IV, V

D. Develop an understanding of how natural selection, mutations, genetic drift, migration and non-random mating affect the frequency of genes from generation to generation (evolution). II, V

E. Develop an understanding of the importance of biological cycles and the interdependence that results from these cycles (i.e. the carbon cycle: autotrophs, heterotrophs, autotrophs). II, V

F. Develop enhanced critical thinking skills. I, III

G. Process skills related to observing, measuring, classifying, communicating and inferring. I, III, IV

H. Develop the ability to interpret related biological information and determine its validity. I, III

*Roman numerals after course objectives reference goals of the Natural and Behavioral Sciences
III. Instructional Processes*:

Students will:

1. Read and critique scientific writings, including those from the text, biological journals, books and the Internet. Communication Outcome, Technological Literacy Outcome, Information Literacy Outcome

2. Listen to and discuss biological information presented by the instructor, educational videos, guest speakers and peers. Communication Outcome

3. Work in teams to collect data, generate graphs and tables and summarize the data and draw conclusions using process skills such as: observing, measuring, classifying, communicating and inferring. Problem Solving and Decision Making Outcome, Information Literacy Outcome, Active Learning Strategies

4. Write a formal laboratory paper based on one of the laboratory exercises completed. The paper will include introduction, materials and methods, results, conclusion and reference sections. Communication Outcome, Information Literacy Outcome

6. Develop a vocabulary that allows them to communicate more effectively with health care providers. Communication Outcome, Personal Development Outcome, Transitional Strategies

7. Locate and evaluate related scientific information in the ERC and on the World Wide Web. Technological Literacy Outcome, Information Literacy Outcome

*Strategies and outcomes listed after instructional processes reference Pellissippi State’s goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*:

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

1. 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

2. Identify the structure and reactivity of the atom related to bonding and the formation of biological compounds. A, F

3. Describe the four classes of organic compounds. A, F, G

4. Describe the structure and function of parts of the eukaryotic cell. A

5. Compare and contrast photosynthesis and cellular respiration. E

6. Explain the basic concepts of DNA and the role of DNA in protein synthesis and thus cellular control. C, F

7. Work standard Mendelian genetics problems, as well as problems with multiple alleles and sex-linked traits and illustrating inheritance. B, F

8. Explain the main bodies of evidence, which support evolution and the mechanisms by which evolution occurs. D, F
10. Locate biologically related material in the ERC and on the WWW. Evaluate biological information they read about or see on TV. H, F
11. Interpret and draw conclusions from graphically presented data. G, F

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

V. Evaluation:

A. Testing Procedures:

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 comprehensive final for the course worth 100 points. The comprehensive final may be used to take the place of one missed exam if there is 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 50 points associated with lecture will be earned by doing a variety of activities determined by your instructor.

B. Laboratory Expectations:

1. 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.

2. Students are expected to dress appropriately for the laboratory to minimize the possibility of the spread of contamination and 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.

3. Students are encouraged to work cooperatively together to complete the exercises in a timely fashion but not to plagiarize notebook work nor to communicate during the practical.

4. After each lab exercise, students are required to complete the post-lab questions. These post-lab questions will be collected and graded on 5 randomly selected dates. Each graded set of post lab questions will be worth 10 points. Post-lab questions will not be accepted late.

5. Students are required to read the scheduled lab exercise before coming to class. To encourage preparation, 5 pre-lab quizzes will be given on randomly selected dates. Each pre-lab quiz is worth 5 points. Students must be present in order to take the pre-lab quiz. There are no make-ups.

6. Students will write a formal lab report dealing with a particular lab exercise they have completed. The report will include an introduction, methods and materials section, results sections, conclusion, and a bibliography. The lab report is worth 25 points. The laboratory report will be due on the week of November 1.

7. Drink, food or any form of tobacco is not allowed in the classroom or laboratory.

C. Field Work:
Students may be required to read supplemental articles or papers on reserve in the library.

D. Other Evaluation Methods:

See instructor for specific information when warranted.

E. Grading Scale:

Students will receive one grade for General Biology 1010. The total number of points on which your grade will be based is 865. In lecture, you may accumulate as many as 650 points, which constitutes about 75% of the grade. In lab, you may accumulate as many as 215 points, which constitutes about 25% of the grade.

Letter grades will be distributed as follows:

Grading Scale (out of a total 865 possible points)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Points</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
<td>(778-865 points)</td>
</tr>
<tr>
<td>B+</td>
<td>87-89%</td>
<td>(752-777 points)</td>
</tr>
<tr>
<td>B</td>
<td>80-86%</td>
<td>(692-751 points)</td>
</tr>
<tr>
<td>C+</td>
<td>77-79%</td>
<td>(666-691 points)</td>
</tr>
<tr>
<td>C</td>
<td>70-76%</td>
<td>(604-665 points)</td>
</tr>
<tr>
<td>D</td>
<td>60-69%</td>
<td>(519-603 points)</td>
</tr>
<tr>
<td>F</td>
<td>0-59%</td>
<td>(0-518 points)</td>
</tr>
</tbody>
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VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course.

B. Academic Dishonesty:

Plagiarism is any form of using another person’s words or ideas without giving proper credit. Plagiarism includes, though is not limited to, the following:

- Copying sentences from a source without putting them in quotes and citing the source.
- Borrowing a sentence from another author and simply substituting a few synonyms or rearranging the order of the sentence.
- Copying from another student.

Plagiarism is a form of mental laziness and will not be tolerated. Any plagiarized assignments will receive an automatic 0 and may not be dropped or replaced by resubmitting the assignment. Second offenses will result in an automatic failure of the course.

C. 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. Lab substitution is only allowed in the case of an emergency and with adequate approval.

When attending an alternate lab, the STUDENT has the following responsibilities:

a. The student must inform his/her regular instructor, and obtain permission from the
substituting instructor. A schedule of lab times and instructors is posted outside the laboratory door. A student should not assume that they could just "show up" and participate in an alternate lab.

b. The student must obtain a signature and date from the substituting instructor at the top of the post-lab question page for that particular exercise.

c. If the substituting instructor administers a pre-lab quiz, or collects post-lab questions, the student MUST write the name of his/her regular instructor at the top of those documents. This will enable the substituting instructor to make regular instructor aware of your attendance.

d. If the substituting instructor did not administer a pre-lab quiz, or collect post-lab questions, it is the student's responsibility to find out if they missed a quiz or assignment from their regular instructor as quickly as possible. The regular instructor will advise the student of options.