MERCER COUNTY COMMUNITY COLLEGE
SCIENCE AND HEALTH PROFESSIONS

COURSE OUTLINE-Revision Date 9/2016

BIO 100  INTRODUCTORY BIOLOGY (3 CREDITS)

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Office Hours: To be announced

Recommended Course Materials

Cell Biology and Genetics (13th Edition)
Christine Evers and Lisa Starr
Thomson Brooks/Cole Publisher, 2013

A copy of the text can be found at the WW and JKC Libraries (Circulation Desk)

CATALOG DESCRIPTION

Selected fundamental principles of biology for students who have not had high school biology or
who need a review before taking other courses in biology, horticulture and the life sciences. Topics include scientific inquiry, chemistry of living organisms, cellular organelles, techniques of observation, data gathering and analysis. Emphasis will be placed on the necessary study skills that are useful when taking college science courses. Occasional laboratory demonstrations. BIO 100 does not fulfill any requirements in the Mercer County Community College biology program and is designed to prepare students for BIO 101, General Biology.

Prerequisite: ENG 034 or permission of instructor
Corequisite: MAT 037 or 042
Course Competencies/Goals:

The student will be able to:

1. Identify and apply various study skills to allow them to be successful in college science courses. (GE 1,2,3,4; CS A, B, D, E, F)
2. Develop and apply knowledge of campus resources to self-advocate. (GE 1,4; CS A, B, D, E, F)
3. Apply scientific notation, convert within the metric system and convert from one unit of measure to another. (GE 2; CS B, F)
4. Acquire basic skills in the laboratory by using standard equipment and measurement and observation techniques in order to gather, analyze and interpret qualitative and quantitative data. (GE 1,2,3,4; CS A, B,F)
5. Develop a basic understanding of the fundamental principles, concepts and terminology of biology. (GE 1,3,4, 9; CS A, B, C, D, E, F)
6. Demonstrate the ability to apply the scientific method of inquiry to gather and use information for the purposes of critical thinking, information analysis and problem solving. (GE 1,2,3,4; CS A, B, D, E, F)

Course-specific General Education Knowledge Goals and Core Skills.

General Education (GE) Knowledge Goals

Goal 1. Communication. Students will communicate effectively in both speech and writing.

Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

Goal 3. Science. Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.


MCCC Core Skills (CS)

Goal A. Written and Oral Communication in English. Students will communicate effectively in speech and writing, and demonstrate proficiency in reading.

Goal B. Critical Thinking and Problem-solving. Students will use critical thinking and problem solving skills in analyzing information.

Goal C. Ethical Decision-Making. Students will recognize, analyze and assess ethical issues and situations.

Goal D. Information Literacy. Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

Goal E. Computer Literacy. Students will use computers to access, analyze or present information, solve problems, and communicate with others.

Goal F. Collaboration and Cooperation. Students will develop the interpersonal skills required for effective performance in group situations.
Units of study in detail

Topic 1: How to Study Science

Learning Objectives
The student will be able to…

- Assess their learning styles, personality types and study habits to gain an understanding of the impact of those factors on college learning.
- Identify factors that impact success in college, including stress, time management, and motivation.
- Create obtainable education goals for the semester.
- Demonstrate an understanding of academic skills needed for college-level courses.
- Demonstrate an understanding of support skills needed for success, note-taking strategies, organizational skills, study practices, memory strategies and test taking.
- Understand the component parts of the course, the syllabus, textbook and class notes.

Topic 2: Resources at the College

Learning Objectives
The student will be able to…

- Identify the need to build and maintain relationships with other students, faculty and academic advisor.
- Locate and utilize support systems on the campus including the Tutoring Center, Student Advocates, Library, Counselors, Transfer Advisors, and Computer Centers.
- Apply search strategies to use the MCCC electronic databases to locate specific information in biology.
- Summarize in a written report a biology article from a peer reviewed science journal.

Topic 3: Is Your Math Ready for Biology?

Learning Objectives
The student will be able to…

- Convert a whole number into scientific notation and the reverse.
- Understand the importance of the metric system in science when expressing measurements in length, mass and volume.
- Convert from unit of the metric system to another unit.
- Convert a measurement from the metric system to the English system and the reverse.

Topic 4: Standard Biology Laboratory Equipment

Learning Objectives
The student will be able to…

- Take measurements using the metric system and convert within the metric system.
- Determine which pieces of equipment are best to use in a biology lab and to be able to use the equipment.
- Convert from Fahrenheit to Celsius when taking temperatures.
- Understand the pH scale and take pH measurements of various solutions.
Topic 5: Introduction to the Compound Light Microscope

Learning Objectives
The student will be able to...
- Describe differences between the light and electron microscope.
- Identify and describe the function of the basic parts of the compound and dissecting light microscopes.
- Focus an object with the compound light microscope.
- Prepare and observe slides of protozoa, animal and plant cells.

Topic 6: Scientific Figures

Learning Objectives
The student will be able to...
- Analyze and interpret scientific figures including maps, graphs, tables, diagrams and illustrations.
- Construct a line graph from scientific data.

Topic 7: The Scientific Process: Laboratory Report

Learning Objectives
The student will be able to...
- Describe the many levels of organization of life.
- Understand the common themes that unite all life.
- Describe how evolution can explain the diversity of life.
- Compare and contrast the difference between natural and artificial selection.
- Understand and be able to apply the scientific method.
- Conduct a laboratory experiment, interpret and analyze the results, and write a laboratory report.

Topic 8: How Do We Name Living Things?

Learning Objectives
The student will be able to...
- Describe the various methods by which organisms were classified in the past and currently.
- Explain the characteristics of a species.
- Distinguish between prokaryotic and eukaryotic cells.
- Compare and contrast the characteristics of the different kingdoms of life.
- Understand the differences between the three different domains.

Topic 9: The Chemistry of Life

Learning Objectives
The student will be able to...
- Understand the structure of an atom and the different types of chemical bonds.
- Describe the importance of water to life.
- Understand how macromolecules are synthesized and degraded.
- Describe the structure and characteristics of the four macromolecules of life.
**Topic 10: Cells - The Basic Unit of Life**

*Learning Objectives*

*The student will be able to…*

- Explain the cell theory and differentiate between prokaryotic and eukaryotic cells.
- Describe the function and characteristics of the organelles found in the eukaryotic cell.
- Identify the organelles of an animal and plant cell

**GRADING/EVALUATIONS**

All tests and quizzes will be given in class. You must take these tests/quizzes at the time scheduled. It is your responsibility to be present. An absence will constitute a zero score on any test/quiz. Tests/quizzes can be taken *only once* and there will be *no make-up dates* for these tests. *If you have an excused absence, it is important that you contact me on the same day of the missed scheduled test/quiz or earlier.*

Homework assignments that are turned in late will result in a reduction of points (2 points for every class meeting). *No Homework Assignments will be accepted 1 week after the due date.*

Final grades will be determined and based on your total accumulation of points. The course work will be divided as follows:

- Tests: 40%
- Quizzes: 30%
- Homework/Library Assignment: 20%
- Attendance/Participation: 10%

Mercer County Community College is committed to ensuring the full participation of all students in its programs. If you have a documented differing ability, or think that you may have a differing ability that is protected under the ADA or Section 504 of the Rehabilitation Act, please contact Arlene Stinson in LB 216 stinsona@mccc.edu for information regarding support services.

If you do not have a documented differing ability, remember that other support services are available to all students on campus including the Learning Center located in LB 214.
Final grades will be based on the point system as indicated below:

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<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>93 – 100%</td>
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<tr>
<td>A-</td>
<td>90 – 92%</td>
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<tr>
<td>B+</td>
<td>87 – 89%</td>
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<tr>
<td>B</td>
<td>83 – 86%</td>
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<tr>
<td>B-</td>
<td>80 – 82%</td>
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<tr>
<td>C+</td>
<td>77 – 79%</td>
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<td>C</td>
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<td>D</td>
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<td>F</td>
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**ATTENDANCE**

I expect students to attend every class unless you are ill or have some other important reason for not attending. If you are unable to attend please inform me of your absence and the reason for being absent. Students will be withdrawn (“W” grade) from the class for having an excessive number of absences with no apparent reason.

**MERCER’S ACADEMIC INTEGRITY POLICY (Refer to the MCCC Student Handbook)**

A student who: (a) knowingly represents work of others as his/her own; (b) uses or obtains unauthorized assistance in the execution of any academic work or; (c) gives fraudulent assistance to another student is guilty of cheating. Violators will be penalized.

**TOPICAL OUTLINE AND READING ASSIGNMENTS**

- **Topic 1:** How to Study Science?
- **Topic 2:** Resources at the College: Instructors, Advisors, Tutoring Center, Library, Counselors and Computer Labs (Summary Paper)
- **Topic 3:** Is Your Math Ready for Biology?
- **Topic 4:** Standard Biology Laboratory Equipment
- **Topic 5:** Introduction to the Compound Light Microscope (Chapter 4)
- **Topic 6:** Scientific Figures (maps, tables, diagrams, graphs and their use)
- **Topic 7:** The Scientific Process (Chapters 1 and 4): Laboratory Report
- **Topic 8:** How Do We Name Living Things? (Chapters 1, 4 and 7))
- **Topic 9:** The Chemistry of Life (Chapters 1, 2 and 3)
- **Topic 10:** Cells - The Basic Unit of Life (Chapters 4 and 5)

9/2016