BROWARD COMMUNITY COLLEGE
COURSE OUTLINE

LAST REVIEW: **2003-2004** *(i.e. 2003-2004)* **NEXT REVIEW:** **2008-2009** *(i.e. 2008-2009)* **STATUS:** **A** *(A, I, D)*

COURSE TITLE: **Introduction to Biology I Laboratory**

COMMON COURSE NUMBER: **BSC1010L**

CREDIT HOURS: **1**

CONTACT HOUR BREAKDOWN *(per 16 week term)*

CLOCK HOURS: *(Voc. Course ONLY)*

Lecture: Lab: **48**

Clinic: Other:

PREREQUISITE(S): CHM 1040 or CHM 1045 with a minimum grade of C

COREQUISITE(S): BSC1010 or CHM 1040 or CHM 1045 with a minimum grade of C

PRE/COREQUISITE(S):

COURSE DESCRIPTION *(750 characters, maximum)*:
This course is the first of a two-semester sequence introducing science majors to biological principles including cell structure and function, cell reproduction, biochemistry and cell metabolism, classical and molecular genetics, and genetic engineering. Laboratory exercises complement lecture topics. Dissection exercises included. Three hours laboratory per week.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s):	4C
General Education Requirements – Associate in Science Degree (AS), meets Area(s):	4C
General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s):	Area

UNIT TITLES

1. Observation, Measurement, and the Scientific Method
2. Chemistry of Life
3. Microscopy
4. Membrane Transport
5. Enzymes
6. Photosynthesis
7. Respiration
8. Chromosomes, Mitosis and Meiosis
9. Classical Genetics
10. Molecular Genetics
11. Genetic Engineering

ASSESSMENT:

Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes.

****** Complete the following only if course is seeking general education status ******

GENERAL EDUCATION Competencies and Skills *:

Please highlight in green font all Competencies/Skills from the list below that apply to this course. In the box to the right of the Competency/Skill, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 5.12) that apply.

1. Read with critical comprehension	1.0
2. Speak and listen effectively	
3. Write clearly and coherently	
4. Think creatively, logically, critically, and reflectively (analyze, synthesize, apply, and evaluate)	1.1-1.3; 5.5; 7.2; 9.4
5. **Demonstrate and apply literacy in its various forms:** *(highlight in green ALL that apply)* (1. technological, 2. informational, 3. mathematical, 4. scientific, 5. cultural, 6. historical, 7. aesthetic and/or 8. environmental)	(1) 2.3; 3.1 – 3.5; 6.1, 6.4, 7.3, 8.1, 11.1 (3) 1.1-1.3; 5.5; 9.4 (4) 1.1 – 1.3; 7.2
6. Apply problem solving techniques to real-world experiences	
7. Apply methods of scientific inquiry	1.1 – 1.3; 2.3; 7.2
8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings	
9. Demonstrate an understanding of and appreciation for human diversities and commonalities	9.3
10. Collaborate with others to achieve common goals.	1.1 – 1.3
11. Research, synthesize and produce original work	
12. Practice ethical behavior	
13. Demonstrate self-direction and self motivation	
14. Assume responsibility for and understand the impact of personal behaviors on self and society	
15. Contribute to the welfare of the community	

* *General Education Competencies and Skills endorsed by '05-'06 General Education Task Force*

Common Course Number: BSC1010L

UNITS

Unit 1 Observation, Measurement, and the Scientific Method

General Outcome:

1.0 (1) The students will be able to describe the scientific method of investigation, (2) demonstrate reading with critical comprehension by performing selected laboratory exercises, and (3) apply the scientific method in laboratory experiments.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

1.1 Measure common objects using metric measurements of length, weight, and volume.

1.2 Demonstrate proper presentation of metric data utilizing graphs.

1.3 Use the scientific method to develop hypotheses and conclusions in solving a simple problem.

1.4 Demonstrate reading with critical comprehension by completing a variety of selected laboratory experiments using the scientific method.

Common Course Number: BSC1010L

Unit 2 Chemistry of Life

General Outcome:

2.0 The students will be able to detect the presence of some of the more important molecules of life.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

2.1 Observe some of the properties of water that are essential in supporting life.

2.2 Demonstrate the use of indicator solutions as related to the measurement of pH.

2.3 Perform tests for the presence of proteins in a solution.

2.4 Perform a test for the presence of carbohydrates.

2.5 Perform a test for the presence of lipids.

Common Course Number: BSC1010L

Unit 3 Microscopy

General Outcome:

3.0 The students will be able to use the microscope to view prokaryotic and eukaryotic cells.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

3.1 Identify principal parts of the compound and stereoscopic dissecting microscopes.

3.2 Demonstrate proper care of the compound and stereoscopic dissecting microscopes.

3.3 Prepare a wet mount slide and stain selected specimens.

3.4 Demonstrate the methods used in describing the morphology of bacterial colonies and cells.

3.5 Categorize bacterial cells based upon their reaction to Gram staining.

3.6 Observe and identify major fungal structures.

3.7 Describe and identify various tissues.

Common Course Number: BSC1010L

Unit 4 Membrane Transport

General Outcome:

4.0 The students will be able to explain several of the mechanisms responsible for moving materials into and out of the cell.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

4.1 Simulate molecular movement using a mechanical model.

4.2 Observe molecular movement and determine some factors that affect the rate of diffusion.

4.3 Demonstrate the process of osmosis using a simulated cell membrane.

4.4 Demonstrate the process of dialysis.

4.5 Describe the response of organisms to changes in their osmotic environment.

Common Course Number: BSC1010L

Unit 5 Enzymes

General Outcome:

5.0 The students will be able to explain variables that affect enzyme activity and rates of reaction.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

5.1 Demonstrate the effect of the concentration of enzymes on the rate of enzyme-mediated reactions.

5.2 Demonstrate the effect of temperature on the rate of enzyme-mediated reactions.

5.3 Demonstrate the effect of pH on the rate of enzyme-mediated reactions.

5.4 Demonstrate the effect of inhibitors on the rate of enzyme-mediated reactions.

5.5 Explain their experimental results by use of graphs and tables.

Common Course Number: BSC1010L

Unit 6 Photosynthesis

General Outcome:

6.0 The students will be able to describe leaf structure and explain the influence of chlorophyll, light and carbon dioxide on photosynthetic reactions in green plants.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

6.1 Separate the pigments in a leaf using paper chromatography.

6.2 Detail the structure of a typical leaf.

6.3 Describe phototropic responses by photosynthetic organisms.

6.4 Use instruments such as the spectrophotometer to determine the absorption spectrum of chlorophyll.

6.5 Observe the effect of each variable on photosynthesis.

Common Course Number: BSC1010L

Unit 7 Respiration

General Outcome:

7.0 The students will be able to describe various aspects of anaerobic respiration and aerobic respiration in selected organisms.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

7.1 Demonstrate anaerobic respiration in yeasts.

7.2 Determine the presence of aerobic respiration in plants by experiments to measure production of carbon dioxide.

7.3 Explain the procedure used in measuring the metabolic rate of a small mammal.

Common Course Number: BSC1010L

Unit 8 Chromosomes, Mitosis and Meiosis

General Outcome:

8.0 The students will be able to recognize the stages of mitosis and meiosis in selected plant and animal cells.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

8.1 Prepare and observe giant salivary chromosomes extracted from insect larvae.

8.2 Observe and identify the stages of mitosis in selected plant and animal cells.

8.3 Observe and identify the stages of meiosis in selected cells.

Common Course Number: BSC1010L

Unit 9 Classical Genetics

General Outcome:

9.0 The students will be able to explain inheritance of selected genetic traits in plants and animals using statistical analysis of data.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

9.1 Explain complete and incomplete dominance using plant and/or animal models.

9.2 Explain independent assortment using a dihybrid cross of Drosophila, the fruit fly.

9.3 Identify their own phenotypes and genotypes for selected human traits.

9.4 Perform a Chi Square analysis of the data collected and explain the results.

Common Course Number: BSC1010L

Unit 10 Genetic Engineering

General Outcome:

10.0 The students will be able to explain recombinant DNA methodology for selected laboratory exercises.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

10.1 Perform selected laboratory activities involving recombinant DNA technology or genetic engineering.

10.2 Identify some of DNA's physical and chemical properties.