



# BROWARD COMMUNITY COLLEGE

## COURSE OUTLINE

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

**COURSE TITLE:** General Botany Laboratory

**COMMON COURSE NUMBER:** BOT2010L

**CREDIT HOURS:** 1

**CONTACT HOUR BREAKDOWN**

*(per 16 week term)*

**CLOCK HOURS:**

*(Voc. Course ONLY)*

Lecture: Lab: **32**

Clinic: Other:

**PREREQUISITE(S):** None

**COREQUISITE(S):** BOT2010

**PRE/COREQUISITE(S):**

**COURSE DESCRIPTION** *(750 characters, maximum):*

Laboratory experiments and field trips to accompany BOT 2010. Upon successful completion of this course, the students should be able to demonstrate knowledge of the plant kingdom through prescribed activities that focus on morphology, taxonomy, anatomy and physiology of selected representative specimens. Dissection exercises included. Special fee charged.

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. Plant Gross Morphology
2. Plant Taxonomy
3. Microscope and Cells
4. Plant Pigments and Chromatography (Optional)
5. Stems
6. Leaves
7. Plant Metabolism
8. Roots
9. Soil Analysis (Optional)
10. Flowers
11. Fruit
12. Propagation - Asexual (Optional)
13. Ecology
14. Survey of the Plant Kingdom



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## 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	1.5, 2.1
2. Speak and listen effectively	
3. Write clearly and coherently	
4. Think creatively, logically, critically, and reflectively (analyze, synthesize, apply, and evaluate)	1.0, 1.1, 1.2, 1.3, 1.4, 2.2, 2.3, 2.4, 4.1
5. Demonstrate and apply literacy in its various forms: <i>(highlight in green ALL that apply)</i> ( 1. technological, 2. informational, 3. mathematical, 4. scientific, 5. cultural, 6. historical, 7. aesthetic and/or 8. environmental )	(1) 3.1, 3.3, 4.1, 4.3, 6.6, 7.5 (2) 2.2, 2.3 (3) 0 (4) 7.1, 11.4
6. Apply problem solving techniques to real-world experiences	2.2, 2.3, 4.4
7. Apply methods of scientific inquiry	2.2, 4.4, 4.5, 7.2, 7.5, 9.4, 9.5, 11.4
8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings	12.1, 13.1, 13.2
9. Demonstrate an understanding of and appreciation for human diversities and commonalities	12.1 – 12.5
10. Collaborate with others to achieve common goals.	
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*



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Common Course Number: BOT2010L

### UNITS Plant Gross Morphology

#### Unit 1

##### General Outcome:

- 1.0 The students should be able to demonstrate an understanding of and be able to recognize the external parts of angiosperm stems and leaves.

##### Specific Measurable Learning Outcomes:

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

- 1.1 Distinguish between monocot and dicot plants.
- 1.2 Distinguish between woody and herbaceous stems.
- 1.3 Distinguish the different leaf types.
- 1.4 Compare phyllotaxis.
- 1.5 Explain the functions of terminal and axillary buds.



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## Unit 2 Plant Taxonomy

### General Outcome:

- 2.0 The students should be able to demonstrate an understanding of and be able to make and use both artificial and natural plant identification keys.

### Specific Measurable Learning Outcomes:

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

- 2.1 Distinguish between artificial and natural plant keys.
- 2.2 Use both artificial and natural plant keys.
- 2.3 Identify plants in the field with any plant key.
- 2.4 Recognize the pitfalls in using any plant key.
- 2.5 Recognize the existence of various taxonomic schemes and show proficiency with the one used in class.



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## Unit 3 Microscope and Cells

### General Outcome:

- 3.0 The students should be able to demonstrate an understanding of and be able to operate both monocular and dissecting microscopes.

### Specific Measurable Learning Outcomes:

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

- 3.1 Properly operate both monocular and dissecting microscopes.
- 3.2 Explain the functions of each part of both the monocular and dissecting microscopes.
- 3.3 Demonstrate proficiency in making wet mounts.
- 3.4 Explain the uses of different plant tissue dyes.
- 3.5 Identify the basic cell types.



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## Unit 4 Plant Pigments and Chromatography (Optional)

### General Outcome:

- 4.0 The students should be able to demonstrate an understanding of and be able to prepare chromatograms of selected plant pigments.

### Specific Measurable Learning Outcomes:

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

- 4.1 Explain the value of chromatography in identifying unknown compounds.
- 4.2 Explain selected types of chromatography.
- 4.3 Demonstrate proficiency in preparing a chlorophyll extract and running a paper chromatogram.
- 4.4 Demonstrate proficiency in the identification of unknown substances when compared to controls.
- 4.5 Determine the reference index of a chromatogram.



# BROWARD COMMUNITY COLLEGE COURSE OUTLINE

Common Course Number: BOT2010L

## Unit 5 Stems

### General Outcome:

- 5.0 The students should be able to demonstrate an understanding of the development, morphology and anatomy of angiosperm and gymnosperm plant stems.

### Specific Measurable Learning Outcomes:

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

- 5.1 Explain the ontogeny of vascular tissue development in stems.
- 5.2 Identify the primary and secondary meristems and the tissues produced by each.
- 5.3 Identify the tissues in plant stems.
- 5.4 Explain the basic functions of each stem cell and the tissue in which it is found.
- 5.5 Distinguish the differences between cross, radial and tangential sections of wood.
- 5.6 Distinguish the basic differences among monocot, dicot and gymnosperm stems.



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### Unit 6 Leaves

#### General Outcome:

- 6.0 The students should be able to demonstrate an understanding of the development, morphology and anatomy of angiosperm and gymnosperm plant leaves.

#### Specific Measurable Learning Outcomes:

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

- 6.1 Explain the ontogeny of vascular tissue development in leaves.
- 6.2 Identify the primary meristems and tissues produced by each.
- 6.3 Identify the tissues and cell types in leaves.
- 6.4 Identify the basic functions of each leaf cell type.
- 6.5 Distinguish the basic differences among monocot, dicot and gymnosperm leaves.
- \*6.6 Demonstrate proficiency in hand sectioning various leaf specimens and staining live tissue.

\*Optional



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### Unit 7 Plant Metabolism

#### General Outcome:

- 7.0 The students should be able to demonstrate an understanding of the physiological processes concerned with the digestive and respiratory processes occurring in plant tissues.

#### Specific Measurable Learning Outcomes:

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

- 7.1 Explain the stored foods in plants.
- \*7.2 Make an extract of the stored foods in seeds and test for the presence of lipids, proteins, and carbohydrates.
- 7.3 Identify selected enzymes necessary for respiration.
- 7.4 Explain the products and by-products of respiration.
- 7.5 Test for the presence of starch in any plant tissue.

\*Optional



**Common Course Number: BOT2010L**

**Unit 8 Roots**

**General Outcome:**

- 8.0** The students should be able to demonstrate an understanding of the development, morphology and anatomy of plant root systems.

**Specific Measurable Learning Outcomes:**

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

- 8.1 Explain the ontogeny of vascular tissue development in roots.
- 8.2 Identify the four root tip zones.
- 8.3 Identify the primary and secondary meristems and the tissues produced by each.
- 8.4 Identify the tissues and cells in plant roots.
- 8.5 Explain the basic functions of each root cell and the tissue in which it is found.
- 8.6 Discuss the differences between cross, radial, and tangential sections of a woody root.
- 8.7 Distinguish the basic differences among monocot, dicot and gymnosperm roots.



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Common Course Number: BOT2010L

## Unit 9 Soil Analysis (Optional)

### General Outcome:

- 9.0 The students should be able to demonstrate an understanding of soil structure and classification and show proficiency in analyzing soil for humus, pH, nitrogen, phosphorus and potassium.

### Specific Measurable Learning Outcomes:

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

- 9.1 Determine by feel and mechanical analysis the structure of a soil.
- 9.2 Describe soil classes based on relative amounts of sand, silt and clay particles.
- 9.3 Compare the nutrient analysis of a soil supplied in class with one brought in by the student.
- 9.4 Determine the humus and pH values of a soil.
- 9.5 Analyze a soil for the relative concentrations of nitrogen, phosphorus and potassium.



**Common Course Number: BOT2010L**

**Unit 10 Flowers**

**General Outcome:**

**10.0** The students should be able to demonstrate an understanding of the development, morphology and anatomy of angiosperm flowers.

**Specific Measurable Learning Outcomes:**

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

- 10.1 Distinguish between monocot and dicot flowers.
- 10.2 Identify the major parts of the flower.
- 10.3 Identify the parts of the ovary.
- 10.4 Identify the basic inflorescence types.
- 10.5 Explain the differences between complete, incomplete, perfect and imperfect flowers.
- 10.6 Explain the difference between self and cross pollination.



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## Unit 11 Fruit

### General Outcome:

**11.0** The students should be able to demonstrate an understanding of the development, morphology and anatomy of angiosperm fruits.

### Specific Measurable Learning Outcomes:

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

11.1 Distinguish between monocot and dicot fruits.

11.2 Identify the parts of the fruit.

11.3 Determine whether a fruit came from a superior or inferior ovary.

\*11.4 Classify fruits using a key.

11.5 Distinguish between a normal fruit and an accessory fruit.

11.6 Explain the differences between a simple and a compound fruit.

\*Optional



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### Unit 12 Propagation - Asexual (Optional)

#### General Outcome:

**12.0** The students should be able to demonstrate an understanding of and become proficient in the various asexual methods employed in plant propagation.

#### Specific Measurable Learning Outcomes:

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

- 12.1 Construct a simple home propagation unit.
- 12.2 Make woody and herbaceous stem cuttings.
- 12.3 Make herbaceous leaf cuttings.
- 12.4 Compare the merits of different propagation mediums.
- 12.5 Demonstrate proficiency in the process of marcottage.
- 12.6 Demonstrate proficiency in making T and chip buds.
- 12.7 Demonstrate proficiency in making veneer and cleft grafts.
- 12.8 Compare budding and stem grafting.
- 12.9 Compare the differences between a scion and a rootstock.



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## Unit 13 Ecology

### General Outcome:

**13.0** The students should be able to demonstrate an understanding of the relationship of plants to their environment.

### Specific Measurable Learning Outcomes:

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

- 13.1 Describe selected plant habitats and the relationship of plants to their environment.
- 13.2 Describe the relationship of selected plants with other organisms.
- 13.3 Explain differences between xerophytic, mesophytic, and hydrophytic habitats.



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## Unit 14 Survey of the Plant Kingdom

### General Outcome:

**14.0** The students should be able to demonstrate an understanding of and be able to recognize algae, fungi, bryophytes and prototracheophytes.

### Specific Measurable Learning Outcomes:

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

- 14.1 Distinguish the thallophytes and tracheophytes.
- 14.2 Recognize and discuss the basic life cycles of selected algae.
- 14.3 Recognize and discuss the basic life cycles of selected fungi and lichens.
- 14.4 Recognize and discuss the basic life cycles of selected prototracheophytes.
- 14.5 Recognize and discuss the basic life cycles of selected ferns.