



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: General Botany

COMMON COURSE NUMBER: BOT2010

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS:

(Voc. Course ONLY)

Lecture: 48 Lab:

Clinic: Other:

PREREQUISITE(S): None

COREQUISITE(S): BOT2010L

PRE/COREQUISITE(S):

COURSE DESCRIPTION *(750 characters, maximum):*

Course designed to treat entire plant kingdom with emphasis on structure, function and genetics of flowering plants. Fundamental cell and tissue structures of both vascular and non-vascular plants are studied. Associated physiological and chemical effects as related to function are emphasized.

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

UNIT TITLES

1. Introduction - The Plant
2. The Plant Cell and its Physiology
3. Structure and Growth of Stems
4. Photosynthesis and the Leaf
5. Respiration and Digestion
6. Root Structure and Development
7. Soils and Plant Nutrition (Optional)
8. The Flower Structure and Seed Development
9. Fruit Development and Structure
10. Sexual and Asexual Propagation
11. Plant Growth and Differentiation
12. The Relationship of Plants to their Environment
13. Alternation of Generations - Plant Life Cycles
14. Survey of the Plant Kingdom
15. Inheritance in Plants



BROWARD COMMUNITY COLLEGE COURSE OUTLINE

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	6.0
2. Speak and listen effectively	
3. Write clearly and coherently	
4. Think creatively, logically, critically, and reflectively (analyze, synthesize, apply, and evaluate)	2.5, 3.5, 5.4, 8.3, 15.1-15.2
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)	(2) 1.1, (6) 1.4
6. Apply problem solving techniques to real-world experiences	3.5, 6.6, 15.4
7. Apply methods of scientific inquiry	2.5
8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings	7.6, 12.0, 12.5
9. Demonstrate an understanding of and appreciation for human diversities and commonalities	
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: BOT2010

UNITS

Unit 1 Introduction - The Plant

General Outcome:

- 1.0 The students will be able to demonstrate an understanding of the basic characteristics of the plant and the basic areas of study in the science of plants.

Specific Measurable Learning Outcomes:

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

- 1.1 Conceptualize and define the basic fields of botany.
- 1.2 Discuss the identification, classification and naming of plants.
- 1.3 Name and explain the basic vegetative parts of the plant.
- 1.4 Recount the significant events in the history of botany.



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Unit 2 The Plant Cell and its Physiology

General Outcome:

- 2.0 The students will be able to demonstrate an understanding of the structure and function of different basic plant cells.

Specific Measurable Learning Outcomes:

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

- 2.1 Describe the structure and function of the nucleus and cytoplasm.
- 2.2 Describe the structure and function of the cell wall and cell membrane.
- 2.3 Identify and describe the moderately specialized plant cells.
- 2.4 Identify and describe the highly specialized plant cells.
- 2.5 Examine the relationship and function of cell organelles.
- 2.6 Discuss the cell cycle.
- 2.7 Explain ploidy.



Common Course Number: BOT2010

Unit 3 Structure and Growth of Stems

General Outcome:

- 3.0** The students will be able to demonstrate an understanding of the structure, development and function of the plant stem.

Specific Measurable Learning Outcomes:

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

- 3.1 Describe the structure, development and function of the apical meristem and the 3 primary meristems in stem tips.
- 3.2 Describe the differences between monocot and dicot stems.
- 3.3 Discuss the functions of primary and secondary meristems.
- 3.4 Differentiate primary and secondary growth.
- 3.5 Compare the theory of stem growth to practical applications.



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Unit 4 Photosynthesis and the Leaf

General Outcome:

- 4.0 The students will be able to demonstrate an understanding of the basic processes involved in photosynthesis and how they relate to the morphology of the leaf.

Specific Measurable Learning Outcomes:

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

- 4.1 Describe the structure and origin of a leaf.
- 4.2 Describe the differences between monocot, dicot, and gymnosperm leaves.
- 4.3 Discuss the relationship of leaf cells to the tissues of the leaf.
- 4.4 Express a working knowledge of photosynthesis.



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Unit 5 Respiration and Digestion

General Outcome:

- 5.0 The students will be able to demonstrate an understanding of the basic processes involved in respiration and digestion of metabolites.

Specific Measurable Learning Outcomes:

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

- 5.1 Discuss the production, storage and digestion of plant metabolites.
- 5.2 Describe the mitochondrion.
- 5.3 Express a working knowledge of the events of respiration.
- 5.4 Compare the similarities and differences between respiration and photosynthesis.



Common Course Number: BOT2010

Unit 6 Root Structure and Development

General Outcome:

6.0 The students will be able to demonstrate reading with critical comprehension by expressing an understanding of the structure, development and function of the root.

Specific Measurable Learning Outcomes:

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

- 6.1 Describe the structure, development and function of the apical meristem and the 3 primary meristems in root tips.
- 6.2 Discuss the 4 zones of a root tip.
- 6.3 Describe the differences between monocot and dicot roots.
- 6.4 Discuss the functions of primary and secondary meristems.
- 6.5 Differentiate primary and secondary growth.
- 6.6 Relate the theory of root growth to practical applications.
- 6.7 Discuss root to shoot balance.
- 6.8 Discuss the absorption of water and minerals and mycorrhizal associations.
- 6.9 Discuss the movement of water and minerals from primary to secondary tissues in the root, stem and leaves.



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Unit 7 Soils and Plant Nutrition (Optional)

General Outcome:

- 7.0 The students will be able to demonstrate an understanding of the structure of soil and the availability of soil nutrients.

Specific Measurable Learning Outcomes:

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

- 7.1 Discuss the mineral and organic structure in soils.
- 7.2 Describe edaphic factors and their interrelationships.
- 7.3 Discuss field capacity.
- 7.4 Discuss ionic exchange capacity of various soil types.
- 7.5 Describe the relationship of pH and nutrient availability.
- 7.6 Identify the 16 elements necessary for optimum plant growth and development.
- 7.7 Explain the labeling of fertilizers.



Common Course Number: BOT2010

Unit 8 The Flower Structure and Seed Development

General Outcome:

- 8.0** The students will be able to demonstrate an understanding of the development, structure and function of the flower along with the production of seeds in the ovary.

Specific Measurable Learning Outcomes:

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

- 8.1 Describe the development, structure and function of a flower.
- 8.2 Describe the major inflorescence types.
- 8.3 Apply the collective names for all flower parts.
- 8.4 Discuss the processes of microsporogenesis and megasporogenesis.
- 8.5 Describe double fertilization and explain its significance.
- 8.6 Discuss the development of an ovule to a seed from the zygote to fully developed embryo.
- 8.7 Describe synchronous dichogamy.



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Unit 9 Fruit Development and Structure

General Outcome:

- 9.0 The students will be able to demonstrate an understanding of the development and structures of the fruit.

Specific Measurable Learning Outcomes:

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

- 9.1 Describe the development of a fruit from the flower ovary and accessory flower parts.
- 9.2 Describe and classify the major fruit types.
- 9.3 Discuss seed distribution processes from the different types of fruit.



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Unit 10 Sexual and Asexual Propagation

General Outcome:

10.0 The students will be able to demonstrate an understanding of the various methods of sexual and asexual propagation.

Specific Measurable Learning Outcomes:

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

10.1 Describe the internal and external morphology of the seed and their functions.

10.2 Discuss the factors necessary for seed germination.

10.3 Discuss the most common methods of seed germination.

10.4 Discuss the advantages and disadvantages of sexual versus asexual propagation.

*10.5 Discuss various advantages and disadvantages of seed planting mediums.

*10.6 Examine the various techniques of bud grafting.

*10.7 Examine the various techniques of stem grafting.

*Optional



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Unit 11 Plant Growth and Differentiation

General Outcome:

11.0 The students will be able to demonstrate an understanding of basic plant growth and differentiation theories.

Specific Measurable Learning Outcomes:

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

- 11.1 Discuss the theories of plant differentiation from the molecular to organismal.
- 11.2 Explain the complexities of hormonal control of plant development.
- 11.3 Discuss the photoperiodic response in plants.
- 11.4 Discuss the trophic responses in plants.



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Unit 12 The Relationship of Plants to their Environment

General Outcome:

12.0 The students will be able to demonstrate an understanding of the basics of ecology.

Specific Measurable Learning Outcomes:

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

- 12.1 Define and understand the basic terms in the field of ecology.
- 12.2 Discuss the four factors necessary for an ecosystem.
- 12.3 Discuss the 7 major world vegetation types and the factors controlling each.
- 12.4 Explain the principles of plant succession.
- 12.5 Discuss and illustrate food webs.



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Unit 13 Alternation of Generations - Plant Life Cycles

General Outcome:

13.0 The students will be able to demonstrate an understanding of the alternation of gametophyte and sporophyte generations as applied to the theory of plant evolution and the basic plant life cycles.

Specific Measurable Learning Outcomes:

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

- 13.1 Discuss the alternation of gametophyte with sporophyte generations in any plant life cycle.
- 13.2 Explain the theory of evolution of primitive plants versus advanced plants.
- 13.3 Describe the 3 basic life cycles.
- 13.4 Detail how to place any given plant into one of the three basic life cycles.



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Unit 14 Survey of the Plant Kingdom

General Outcome:

14.0 The students will be able to demonstrate an understanding of the phylogeny in the plant kingdom starting with the bacteria and finishing with flowering plants.

Specific Measurable Learning Outcomes:

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

14.1 Discuss the characteristics which distinguish all plant divisions.

14.2 Recognize and discuss the importance of the Prokaryotes, Algae, Eumycota, Bryophyta, Prototrichophytes, Pterophyta, Gymnosperms, and Angiosperms.



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Unit 15 Inheritance in Plants

General Outcome:

15.0 The students will be able to demonstrate an understanding of the basic principles of heredity in plants.

Specific Measurable Learning Outcomes:

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

- 15.1 Apply the basic Mendelian Laws of heredity.
- 15.2 Define and apply the basic terms used in inheritance.
- 15.3 Discuss monohybrid and dihybrid crosses.
- 15.4 Solve simple problems of heredity.
- 15.5 Discuss linkage, crossovers and inversions as applied to genetics.
- 15.6 Discuss the complexities of applied genetics.