

**MIAMI DADE COLLEGE
SCHOOL OF EDUCATION
COURSE SYLLABUS**

SURVEY OF PLANT DIVERSITY LABORATORY

This syllabus, course calendar, and other attending documents are subject to change during the semester in the event of extenuating circumstances.

Course Prefix & Number: BOT 3015 L
Credit Hours: Two (2)
Prerequisites: ZOO 3021, ZOO 3021L, PCB 3043
Corequisite: BOT 3015
Date & Time: TBA
Professor Information: TBA

I. COURSE DESCRIPTION

This course is designed to provide the necessary laboratory experiments and dissection exercises to supplement/accompany the BOT-3015, Survey of Plant Diversity lecture course. This laboratory course explores the plant kingdom and gives emphasis on structure, function and genetics of plants. Appropriate dissections and laboratory exercises are designed to explore the fundamental cell and tissue structures of both vascular and non-vascular plants.

Prerequisites: ZOO 3021, ZOO 3021L, PCB 3043; Corequisite: BOT 3015

II. COURSE OBJECTIVES

Competency 1: The student will demonstrate knowledge of bright field microscopy and identify and contrast common organisms from Monera, Protista, Fungi, and Archaea by:

- 1.1 describing the parts and function of a compound microscope.
- 1.2 demonstrating the care and use of both compound and dissection microscopes.
- 1.3 identifying the general shape and size of bacteria.
- 1.4 comparing and contrasting different groups of protozoa and algae using representative members of each group.
- 1.5 differentiating between the asexual reproduction and the sexual reproduction in Fungi.
- 1.6 identifying the different asexual spores in fungi.
- 1.7 identifying the different sexual reproductive structures and sexual spores in fungi, and how they are used in the classification of fungi.
- 1.8 identifying representative members of Archaea.
- 1.9 describing the nature and structure of lichens.

Competency 2: The student will demonstrate knowledge of and identify common vascular and nonvascular plants including bryophytes, ferns, gymnosperms, and angiosperms by:

- 2.1 describing the life histories and related reproductive structures of mosses and liverworts.
- 2.2 describing the distinguishing characteristics of mosses and liverworts.
- 2.3 describing the life cycles of ferns and their allies.
- 2.4 describing and identifying distinguishing features of Psilophyta, Sphenophyta, Lycopphyta and Pterophyta.
- 2.5 describing the distinguishing features of Gymnosperms and differentiate between the different groups of Gymnosperms.
- 2.6 identifying the different events in the life cycle of a pine.
- 2.7 identifying the parts and functions of pine cones and pine seed.
- 2.8 describing the life cycle of Angiosperms.
- 2.9 explaining why angiosperms are considered to be the most advanced land plants.

Competency 3: The student will demonstrate knowledge of and identify the external parts of angiosperm stems and leaves by:

- 3.1 describing the external structure and function of stems
- 3.2 describing the functional significance of stems.
- 3.3 differentiating between dicot and monocot stems.
- 3.4 distinguishing between a simple leaf and a compound leaf and describing the parts of a complete leaf.
- 3.5 differentiating between monocot and dicot leaves.
- 3.6 explaining the adaptations of leaves of mesophytes, xerophytes and hydrophytes.

Competency 4: The student will demonstrate knowledge of the development, morphology and anatomy of root systems, stems, and leaves of vascular plants by:

- 4.1 differentiating between tap and fibrous root systems.
- 4.2 distinguishing between root hairs and lateral roots.
- 4.3 identifying root tissues such as epidermis, cortex, endodermis, pericycle, phloem, xylem and describing their functions.
- 4.4. describing and identifying the internal tissues of monocot and dicot stems.
- 4.5 describing and identifying internal anatomy of monocot and dicot leaves.
- 4.6. explaining the significance of anatomical differences in leaves.

Competency 5: The student will demonstrate knowledge of the development, morphology, and anatomy of plant flowers, fruits, and seeds by:

- 5.1 describing the structure and functions of flowers.
- 5.2 describing the events associated with microsporogenesis, megasporogenesis, fruit and seed development.
- 5.3 explaining the seed structure.
- 5.4 explaining diversity of fruits by giving examples.

Competency 6: The student will demonstrate knowledge of and the roles of autotrophs in ecosystems by:

- 6.1 distinguishing between autotrophs and heterotrophs in an ecosystem.
- 6.2 describing the energy flow and nutrient recycling in an ecosystem.

6.3 analyzing different ecosystems and designing an ideal ecosystem.

Competency 7: The student will demonstrate knowledge of the physiological processes of cell respiration and photosynthesis occurring in plant cells and tissues by:

- 7.1. demonstrating and explaining the correlation between the presence of starch and photosynthetic activity in leaves.
- 7.2. explaining the paper chromatography technique for separating the plant pigments from leaf extract.
- 7.3. demonstrating and explain the role of carbon dioxide in photosynthesis.
- 7.4. explaining the key events in cellular respiration.

Competency 8: The student will demonstrate knowledge of plant reproduction and plant cell structures by:

- 8.1. describing the structure and function of cellular organelles visible with a light microscope.
- 8.2. identifying and describing different tissue types such as parenchyma, collenchyma, sclerenchyma, epidermis and vascular tissues with the help of prepared slides.
- 8.3. distinguishing between the different phases of mitosis.
- 8.4. describing the structure and function of spindle fibers, poles, equator, chromatids, cell plate and phragmoplast.

III. REQUIRED TEXTBOOK(S), RESOURCES AND MATERIALS

Stern, K.R.R. (2002).Laboratory Manual to Accompany Introductory Plant Biology.

IV. SUPPLEMENTARY READING AND REFERENCES

Placed on reserve at the reserve desk of the campus library:

- Readings and references materials
- Instructor written additions to problems sets
- Current textbook

V. TECHNOLOGY/AUDIO/VIDEO

Placed on reserve at the reserve desk of the campus library:

- Audio/video materials
- Software

VI. SUPPLIES

Required and optional supplies will be announced during first week class.

VII. METHODS OF INSTRUCTION

Instruction and student interactions will include, but not be limited to: laboratory activities, simulations, fieldtrips, collaborative and cooperative learning, problem-based learning, discussion, and the use of technology.

VIII. COURSE REQUIREMENTS AND EXPECTATIONS

A. ATTENDANCE AND WITHDRAWAL POLICY

Students are expected to attend every class. The instructor will keep a record of class attendance. It is the student's responsibility to notify the instructor in advance of any absence. It is the instructor's prerogative to withdraw students with more than three unexcused absences.

B. GRADES

Your final grade will be based on the following information:

1. Laboratory Reports (40%)
2. Laboratory exercises and assignments (60%)

C. GRADING SCALE

- A: 90-100
B: 80-89
C: 70-79 (minimum passing score)
D: 60-69 (must repeat course)
F: 0-59 (must repeat course)

A grade of I (incomplete) can be assigned only under the following conditions.

1. The student requests the grade of incomplete.
2. The student has completed all exams up to that time with the possible exception of the last unit exam and/or final exam.
3. The student has completed all assignments up to that time.
4. The student has at least a C average up to that time.
5. The circumstances that prevent the student from completing the course by the end of the term must be extenuating and documentable.
6. The student must agree to make up the missing work by the date specified by the instructor or by the end of the next major term, whichever is earlier. This agreement must be formalized by completing the College's *Agreement for a Grade of Incomplete* form.

IX. ALTERNATE INSTRUCTION/LEARNING SUPPORT CENTERS

Students who need help completing assignments or with work in-class are encouraged to seek help at the support centers on their campus.

X. AMERICANS WITH DISABILITIES ACT (ADA) STATEMENT

Students who have a disability that might affect their performance in this class are encouraged to contact Access Services, in confidence, as soon as possible.

XI. ACADEMIC INTEGRITY

The instructor supports the College's policies regarding academic integrity and honesty. These include the policies regarding cheating, plagiarism, and fabrication of information. It is *your* responsibility to understand fully what these policies are. As such, you are

encouraged to obtain a copy of the *Student Rights and Responsibilities Handbook* and read these policies carefully and thoroughly.

- A. **Cheating** – Cheating is defined as the improper taking or tendering of any information or material which shall be used to determine academic credit. Taking of information includes, but is not limited to, copying graded homework assignments from another student; working together with another individual(s) on a take-home test or homework when not specifically permitted by the instructor; looking or attempting to look at another student's paper during an examination and; looking or attempting to look at text or notes during an examination when not permitted. Tendering of information includes, but is not limited to, giving your work to another student to be used or copied; giving someone answers to exam questions either when the exam is being given or after having taken an exam; giving or selling a term paper or other written materials to another student; sharing information on a graded assignment.

- B. **Plagiarism** – Plagiarism is defined as the attempt to represent the work of another as the product of one's own thought, whether the other's work is published or unpublished, or simply the work of a fellow student. Plagiarism includes, but is not limited to, quoting oral or written materials without citation on an exam, term paper, homework, or other written materials or oral presentations for an academic requirement; submitting a paper which was purchased from a term paper service as your own work; submitting anyone else's paper as your own work.

- C. **Copyright law** – Violation of copyright law is defined as the attempt to represent the work of another as the product of one's own thought, whether the other's work is written or found on the Internet or simply the work of a fellow student, violates the copyright laws. It is not limited to quoting oral or written materials, it includes photographs, clipart and music samples. For an academic requirement; submitting a paper, image, and/or music which was copied from website as your own work; submitting anyone else's paper as your own work is considered a breach of copyright laws unless they fall into the guidelines of the Teach Act <http://www.lib.ncsu.edu/scc/legislative/teachkit/>

All class notes, lecture outlines, class assignments, examinations, and any other course information are copyrighted material and may not be copied or distributed in any format or for any purpose without permission from the instructor or the author as the case may be.

XII. MAJOR COURSE COMPETENCIES AND STANDARDS

MAJOR LABORATORY COMPETENCIES	NSTA STANDARDS	SUBJECT MATTER STANDARDS	STATE COMPETENCIES & SKILLS
Upon successful completion of this course, the student will demonstrate knowledge of...			
1. ...and identify and contrast common organisms from Monera, Protista, Fungi, and Archaea.	C2a2, C2a3	6.1	1.16, 5.4, 5.8, 7.2, 7.13, 7.14, 7.15
2. ...and identify common vascular and nonvascular plants.		6.2, 6.12	7.16
3. ...and identify the external parts of angiosperm stems and leaves.		6.12	7.19
4. ...the development, morphology and anatomy of root systems, stems, and leaves of vascular plants.	C.1.3	6.12	7.20
5. ... the development, morphology, and anatomy of plant flowers, fruits, and seeds.		6.2, 6.12	7.18, 7.24
6. ...and identify the role of autotrophs in ecosystems.		9.13	4.12
8. ...the physiological processes concerned with photosynthesis and cell respiratory processes occurring in plant cells and tissues.	C2a1, C2a8	7.5, 9.2, 9.5	
9. ...plant reproduction and plant cell structures.	C2a2, C2a8	6.1, 6.11, 6.12	5.5, 5.10, 7.21, 7.22

XIII. SAMPLE LABORATORY COURSE CALENDAR

Week 1	Survey of Plant Kingdom	○ Competency 1, 2
Week 2		
Week 3	Plant Physiology Using technology to study plants	○ Competency 8, 9
Week 4		
Week 5	Leaves, Roots, and Stems	○ Competency 3, 4
Week 6		
Week 7	Flowers, Fruits, and Seeds	○ Competency 5
Week 8		
Week 9	Plant Reproduction Internet resources and simulations	○ Competency 9
Week 10		
Week 11	Photosynthesis	○ Competency 6
Week 12		
Week 13	Fungi, Monera, and Archaea	○ Competency 1
Week 14		
Week 15	Protista and Viruses	○ Competency 1, 7
Week 16		