MIAMI DADE COLLEGE
SCHOOL OF EDUCATION
COURSE SYLLABUS

SURVEY OF PLANT DIVERSITY

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**
Credit Hours: **Three (3)**
Prerequisites: **ZOO 3021, ZOO 3021L, PCB 3043**
Corequisite: **BOT 3015 L**
Date & Time: **TBA**
Professor Information: **TBA**

I. COURSE DESCRIPTION

This course covers the anatomy/morphology, physiology, ecology, evolution, and diversity of plants and plant-like organisms.
Prerequisites: ZOO 3021, ZOO 3021L, PCB 3043; corequisite: BOT 3015L

II. COURSE OBJECTIVES

Competency 1: The student will demonstrate knowledge of plant taxa starting with bryophytes and finishing with angiosperms including their morphology and physiology by:

1.1 describing the distinguishing features bryophytes as a group and the different phyla in this group.
1.2 describing the distinguishing features of seedless vascular plants and the four phyla of seedless vascular plants.
1.3 describing the basic differences between angiosperms and gymnosperms.

Competency 2: The student will demonstrate knowledge of similarities and differences between vascular and nonvascular plants by:

2.1 defining vascular and non vascular plants.
2.2 differentiating vascular and non vascular plants in terms of the morphology and ecology.
2.3 describing the structure of conducting tissues of plants and the function of each cell component.

Competency 3: The student will demonstrate knowledge of the structure and function of leaves, stems and root systems in higher plants including a comparison between monocots and dicots by:

3.1. describing the root regions and their functions.
3.2. explaining the specific functions of the endodermis and the pericycle.
3.3. describing and compare the differences among the various types of specialized roots.

3.4. describing the tissues that develop from shoot apices and the meristems from which each tissue is derived.
3.5. distinguishing between primary and secondary tissues.
3.6. describing the function of vascular cambium, cork cambium, stomata, and lenticels.
3.7. distinguishing between the stems of herbaceous and woody dicots and that of monocots.
3.8. describing the functions of a typical leaf and the specific tissues and cells that contribute to those functions.
3.9. identifying the differences between pinnate, palmate, and dichotomous venation and also the differences between simple and compound leaves.
3.10. describing tendrils, spines, storage leaves, reproductive leaves, floral leaves, and different types of insect-trapping leaves.
3.11. explaining why deciduous leaves turn various colors in the fall and how such leaves are shed.

Competency 4: The student will demonstrate knowledge of the structure, and types of flowers and fruits, including a comparison between monocots and dicots by:

4.1 identifying the parts of a typical flower and the function of each part.
4.2 explaining the features that distinguish monocot and dicot reproductive structures..
4.3 distinguishing between fruits and vegetables.
4.4 identifying types of fleshy and dry fruits and will know how simple, aggregate, and multiple fruits are derived from the flowers.
4.5 explaining the adaptations of fruits and seeds to the agents by which they are dispersed.
4.6 explaining the changes that occur when a seed germinates and environmental conditions necessary.
4.7 explaining the factors that control dormancy and describing how these may be broken both naturally and artificially.

Competency 5: The student will demonstrate knowledge of the morphological development of vascular plants throughout geological history by:

5.1 describing and outlining the early development of evolutionary concepts.
5.2 explaining the various lines of evidence for evolution.
5.3 explaining the human and ecological relevance of ferns.
5.4 contrasting and identifying the basic differences between angiosperms and gymnosperms.
5.5 explaining the life cycle of a flowering plant, including the shift from haploid to diploid cells, and vice versa.
5.6 explaining and contrasting the development of the male and female gametophytes.
5.7 outlining the co-evolution of pollinators and the associated characteristics of the flowers.

Competency 6: The student will demonstrate knowledge of plant growth, reproduction and responses by:

6.1 contrasting growth, differentiation and development.
6.1 describing the role of plant hormones in plant growth.
6.2 listing and describing the different factors that affect plant growth and development.
6.3 explaining phototropism, gravitropism, thigmotrophism and thigmomorphogenesis.
6.4 describing photoperiodism, and circadian rhythms.
6.5 explaining how an integrated control system can regulate plant processes like flowering.
6.6 explaining what phytochrome is and how it functions.
6.7 differentiating between vegetative reproduction and sexual reproduction in plants.
6.8 contrasting the reproduction and life cycles of Phylum Psilophyta, Phylum Lycophyta, phylum Equisetophyta and Phylum Polypodiophyta.
6.9 explaining "Alterations of Generations' in plants.

Competency 7: The student will demonstrate knowledge of the processes of photosynthesis and cellular respiration by:

7.1 explaining the light dependent and light independent reactions of photosynthesis.
7.2 describing the major consequences of photorespiration.
7.3 differentiating between the C3, C4 and CAM pathways of carbon fixation and their ecological relevance.
7.4 explaining the possible fates of photosynthetic products.
7.5 explaining the overall process of cellular respiration and its significance to plants.

Competency 8: The student will demonstrate knowledge of the flow of energy in the environment from plants through the various consumers and interactions in an ecosystem by:

8.1. explaining the role of producers, primary consumers, secondary consumers, and decomposers in an ecosystem.
8.2. describing/outlining energy flow through an ecosystem.
8.3. explaining the cycling of carbon and nitrogen.
8.4. defining succession and how it may start with rocks or with water.
8.5. illustrating and explaining ecotype, secondary succession, eutrophication, and climax vegetation.
8.6. explaining the human and ecological relevance of ferns.
8.7. describing ways in which humans have disrupted ecosystems.
8.8. constructing a four step food pyramid using local organisms.
8.9. demonstrating the interactions in an ecosystem such as pollination, plant defenses and inter/intra specific competitions.
8.10. identifying three asexual and / or sexual plant reproductive strategies.
8.11. identifying three common horticultural methods for propagating plants.
8.12. demonstrating the knowledge on ecological, aesthetical and economical importance of plants

Competency 9: The student will demonstrate knowledge of organisms in the Protista, Fungi, Monera, and Archaea Kingdoms as well as Viruses by:

9.1 identifying key individuals and their contributions to the study of botany as well as the processes of botanical study.
9.2 describing the distinguishing features of Kingdoms, Protista, Fungi, Monera and Archaea.
9.3 describing the features that Kingdom Protista share with one another and note the basic ways in which they differ.
9.4 describing the different taxa of algae and their human, ecological and economic significance.
9.5 identifing the major different taxa of Fungi.
9.6 describing the classification of bacteria and the forms of nutrition in bacteria.
9.7 explaining the different ways bacteria are useful as well as harmful to humans.
9.8 describing the characteristics of Viruses and how they differ from bacteria in form and reproduction.

III. REQUIRED TEXTBOOK(S), RESOURCES AND MATERIALS

Stern, Bidlack, Jansky, Bidlack (2003). Introductory Plant Biology.

IV. SUPPLEMENTARY READING AND REFERENCES

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

- Readings and references materials
- 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 interaction may include but not be limited to lecture, group projects, class discussion, collaborative and cooperative learning, case studies, role-playing, simulations, problem-based learning, optional fieldtrips, hands-on activities, student presentations, 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, or immediately following, any unplanned absence. It is the

instructor's prerogative to withdraw students with more than three unexcused absences.

B. ASSIGNMENTS

Presentation (15% of grade)
Create and deliver a 15-20 minute oral presentation related to a mutually agreed upon botanical topic. Your presentation should use available classroom technology. Presentation details and a grading rubric will be provided to you.

Written Assignments (15% of grade)

b. Faculty may choose to assign some of the following assignments or allow the students to choose some number of assignments from this list
    1. create a small herbarium collection
    2. write a study guide (Q + A) for a course-related video
    3. answer study guide questions for a course-related video
    4. create a BOT-related website
    5. annotate a collection of course-related websites
    6. complete a long term observation of a local plant community
    7. do a poster presentation on a course-related topic
    8. complete textbook companion site activities from the Web
    9. complete a set of questions from a fieldtrip to FTBG, ENP or local plant community (even at MDC/KC)
    10. create a course-related Power Point

C. GRADES

Your final grade will be based on the following information:

1. Five quizzes/exams (50%)
    - quizzes and exams will include, but not be limited to, true/false, multiple choice, short answer and / or essay questions
2. One comprehensive final exam (FEAP Task 8e) (20%)
3. Oral presentation (15%)
4. Written Assignments (15%)

D. 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 DISABILITY 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. Their phone number is _____.

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 intellectual materials 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 COURSE COMPETENCIES/OBJECTIVES	NSTA STANDARDS	SUBJECT MATTER STANDARDS	STATE COMPETENCIES & SKILLS
Upon successful completion of this course, the student will demonstrate knowledge of …			
1. … major groups of plants including their morphology and physiology.	C2a2, C2a3	6.1, 6.2, 6.3, 6.5, 6.11	5.5, 5.7, 7.1, 7.15, 7.16
2. … similarities and differences between vascular and nonvascular plants.		6.1, 6.2	7.17
3. … the structure and function of leaves and stems and the different types of root systems in higher plants.	C.1.5	6.12, 12.1-12.3	5.10, 7.20
4. … the structure, parts, and some modifications of flowers, including a comparison between monocots and dicots and the nature of the development of fruit.			7.19
5. … the morphology and differences between angiosperms and gymnosperms and the geological history of both.			7.18
6. …plant growth and reproduction.	C2a8	7.7, 7.8, 7.10, 7.14	4.15, 7.21, 7.22, 7.24
7. …photosynthesis processes.	C2b13	7.5, 9.2, 9.3, 9.4, 9.5, 9.13	4.2, 4.3, 4.7, 4.9, 5.10
8. …the flow of energy in the environment, specifically related to plants.	C2a1, C2b14	9.13, 9.14	4.12, 8.4
9. … organisms and their characteristics from Protista, Fungi, Monera, and Archaea.	C2a2, C2a3 C2b17	6.1, 6.2, 6.5, 6.6, 6.11, 7.1, 7.2, 12.1,12.3	5.4, 5.5, 5.8, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.13, 7.14, 9.8

XIII. SAMPLE COURSE CALENDAR

Week 1	Overview of Plant Kingdom	o Competency = 1
Week 2	Monera , Archaea, Protista, Fungi and Viruses	o Competency = 9
Week 3	Non-Vascular & Lower Vascular Plants (ferns)	o Competency = 1, 2, 6
Week 4	Non-Vascular & Lower Vascular Plants (ferns)	o Competency = 1, 2, 6
Week 5	Gymnosperms	o Competency = 1, 2, 4, 5
Week 4	Angiosperms	o Competency = 1, 2, 4, 5
Week 5	Plant cells and tissues	o Competency = 2, 3, 4, 6
Week 6	Leaves and Roots	o Competency = 1, 3
Week 7	Photosynthesis & Respiration	o Competency = 7
Week 8	Stems and Modified Stems	o Competency = 2, 3
Week 9	Plant Growth and Reproduction	o Competency = 6
Week 10	Plant Growth and Reproduction	o Competency = 6
Week 11	Fruits and Seeds	o Competency = 1, 5
Week 12	Plant Responses	o Competency = 6
Week 13	Plant Adaptations & Animal Interactions	o Competency = 4, 6
Week 14	Flow of Energy	o Competency = 8

Week 15	Plant Ecology.	o Competency 8
Week 16	Oral Presentations	o Competency 1-9