11:776:210 Principles of Botany (4 credits) (Spring 2012)

Offered: Spring semester.

Instructor: Albert Ayeni, Ph.D. (2-6289; ayeni@aesop.rutgers.edu)

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Pre-requisites and other registration restrictions:

01:119:101 General Biology OR EQUIVALENT OR PERMISSION OF INSTRUCTOR OR DEPARTMENT

Format: Lecture and laboratory

Course Website: eCompanion (accessible to Instructor, Teaching Assistant and registered students only)

Description:

This course focuses on introductory plant biology as a fundamental element of understanding the plant from structural and functional perspectives. It defines a plant and introduces it as an essential component of the environment highlighting its roles in stabilizing human existence. It describes the plant from the cellular to the mature growth stages drawing the student’s attention to the relationship between structure and function of various components including the micro- and macro-scopic elements. The fundamentals of plant anatomy, metabolism, physiology and development are covered drawing examples primarily from flowering plants (Angiosperms). The evolutionary and ecological relationships among various plant groups (non-vascular/vascular & non-flowering/flowering plants) are described. This is a Lab/lecture course that will have topics in lecture format using recommended texts and laboratory exercises. Class presentations are required towards the end of the semester where students are given the opportunity to express their understanding of a topic of interest selected from among several options suggested at the beginning of class.

Learning Goals:

1. Understand the role of plants as energy sources for living things including humans

2. Apply the fundamentals of plant anatomy, physiology and morphology to the classification of members of the Plant Kingdom into non-vascular/vascular plants and non-flowering/flowering plants.

3. Understand the relationship between plant structure and function

4. Understand the evolutionary and ecological relationships among various plant groups
Topics

January 18:  Class Introductions - Syllabus, class presentation topics. What is Botany? What is a plant? Plant role in human life, scientific communication in Botany.
January 23:  The plant cell: Structure (Cell wall, cell membrane, cytoplasm, vacuole, organelles, nucleus)
January 25:  Cell division: somatic cells
January 30:  Cell division: reproductive cells
February 1:  Cell differentiation: simple/primary tissues
February 6:  Cell differentiation: complex/secondary/permanent tissues
February 8:  Plant metabolism: Energy dynamics
February 13:  Plant metabolism: Photosynthesis
February 15:  Plant metabolism: Respiration
February 20:  Plant growth and development: Germination & seedling growth
February 22:  Plant growth and development: Response to stress factors
February 27:  Plant parts: Root structure & function
February 29:  Plant parts: Stem structure & function
March 5:    Plant parts: Leaf structure & function
March 7:    Mid-Semester Exam (25%)
March 10-18:  Spring Break
March 19:  Plant parts: Flower structure & function
March 21:  Plant parts: Fruit structure & function
March 26:  Plant parts: Seed/grain structure & function
March 28:  Plant reproduction (sexual/asexual)
April 2:    Plant evolution (prokaryotes & eukaryotes)
April 4:    Plant classification: Non-vascular & vascular plants
April 9:    Plant classification: Non-flowering & flowering plants
April 11:   Lecture free
April 16:   Class presentation
April 18:   Class presentation
April 23:   Class presentation
April 25:   Class presentation
April 30:   Final Exam (25%)

Examinations: There will be a mid-semester exam and a final exam, each worth 25% of the class grading. Exams will be short answer questions using a mixture of multiple choice, true/false and short note questions.

Recommended texts: Lectures will be based on current scientific information drawn from recent Botany/Plant Biology texts, reputable journal articles and credible/authoritative Internet websites. Textbooks to be consulted include:


**Grading:** Class performance is based on (i) two Exams (50%), (ii) Class presentation (20%), (iii) Laboratory exercise (20%), and (iv) Class participation based on attendance and contribution in class discussions (10%). Student letter grade is awarded based on total score out of 100 points.