BOTANY AND PLANT PATHOLOGY

Department of Botany and Plant Pathology
College of Natural Science

105. Plant Biology
Fall, Spring, 3 credits
Plant structure, function, development, genetics, diversity, and ecology.

106. Plant Biology Laboratory
Fall, Spring, 1 credit
P: BOT 105 or concurrently.
Cell structure, anatomy, physiology, growth and development, and diversity of plants.

202. The Plant Kingdom
Spring, 2 credits
P: BS 110 or BOT 105 or LBS 144.
Morphology of the major plant groups with an emphasis on structure, reproduction, and evolution. Field trips required.

205. Pests, Society and Environment
Fall, Spring, 3 credits
P: BOT 105 or BOT 106 or LBS 144.

301. Introductory Plant Physiology
Fall, Spring, 3 credits
P: CEM 141 or CRM 151; CRM 161; BOT 105 or BS 111 or LBS 145. R: Completion of Tier I writing requirement.
Principles of plant physiology relating plant structure to function. Cell physiology, water relations, effects of light and temperature, respiration, photosynthesis, mineral nutrition, and hormone action.

335. Plants Through Time
Spring of odd-numbered years, 3 credits
P: BOT 105 or BOT 106 or BLG 201 or LBS 144. R: Juniors and above.
Evolutionary history of plants, the development of ecosystems, and the use of plant tissue in the reconstruction of ancient environments and climate.

336. Useful Plants
Fall of odd-numbered years, 3 credits
P: CEM 142 or CRM 143 or CRM 152; BOT 105 or BS 110, BS 111 or LBS 144, LBS 145.
Ways in which plants are used for myriad purposes from food and construction materials to medicines and perfumes. The potential for expanding the uses of plants through biotechnology will be explored.

341. Fundamental Genetics
Fall, Spring, Summer, 4 credits
P: BOT 105 or LBS 144.
Principles of heredity in animals, plants and microorganisms. Formal and molecular methods in the study of gene structure, transmission, expression, and evolution.

345. Evolution
Fall, 3 credits
P: ZOL 341. R: Not open to freshmen.

355. Ecology
Fall, Spring of odd-numbered years, 4 credits
P: BOT 105 or BS 111 or LBS 144.
Plant and animal ecology. Interrelationships of plants and animals with the environment. Principles of population, community, and ecosystem ecology. Application of ecological principles to global sustainability.

362. Management of Turfgrass Pests
Fall, Spring, 3 credits
P: BOT 823. R: Approval of department.
Chemical, biological, and cultural methods of managing weeds, diseases, and insect pests of turfgrass. Environmental considerations in pest management.

402. Biology of Fungi
Fall, 3 credits
P: BS 110, BS 111 or BOT 105 or LBS 140 or MIC 302. R: Approval of department.
Major groups of fungi: classification, habitats and diversity. Significance of fungi in nature and their economic importance.

405. Introductory Plant Pathology
Spring, 2 credits
P: BS 110, BS 111 or BOT 105 or LBS 140. R: Completion of Tier 1 writing requirement. Not open to students with credit in BOT 407.
Important plant diseases and the organisms that cause them. Principles of disease management including application of chemicals, plant breeding, biological control, and genetic engineering.

407. Diseases and Insects of Forest and Shrub Trees
Spring, 3 credits
P: BOT 105 or BS 110 or LBS 144; BOT 218 or FOR 204 or HRT 211. R: Completion of Tier 1 writing requirement. Not open to students with credit in BOT 407.
Important plant diseases and the organisms that affect them. Principles of disease management including application of chemicals, plant breeding, biological control, and genetic engineering.

412. Virology
Spring, 3 credits
P: BS 110 or BOT 105 or LBS 144. R: Completion of Tier 1 writing requirement.
Viral replication and gene expression of the major classes of viruses. Viral-cell interactions and viral diseases.

414. Plant Physiology: Metabolism
Fall, 3 credits
P: CEM 251; BOT 105 or BS 110, BS 111 or LBS 144, LBS 145.
General principles underlying metabolic processes of plants. Photosynthesis, translocation and water relations, nitrogen metabolism, cell wall biosynthesis, and structures associated with those processes.

415. Plant Physiology: Growth, Development and the Environment
Spring, 3 credits
P: CEM 251; BOT 105 or BS 110, BS 111 or LBS 140.
Principles of plant growth and development with emphasis on environmental and hormonal factors that control progression of the plant through its life cycle. Tissue culture and genetic engineering in plants.

416. Experiments in Plant Physiology and Molecular Biology
Fall, 2 credits
P: BOT 414 or BOT 415. R: Completion of Tier 1 writing requirement.
Experiments illustrating principles of plant physiology and molecular biology. Advanced techniques such as agrobacterium mediated gene transfer, DNA cloning, enzyme linked immunosorbent assays (ELISA), protein and DNA electrophoresis.

418. Plant Systematics
Spring, 3 credits
P: W.K. Kellogg Biological Station. R: BOT 105 or BS 111 or LBS 140.
Classification and evolution of plants, with emphasis on identification, characteristics of plant families, and systematic theory and practice.

423. Aquatic Plant Biology
Fall, 3 credits
P: W.K. Kellogg Biological Station. R: BOT 105 or BS 111 or LBS 144, LBS 145.
Identification, ecology and community relations of algae and aquatic vascular plants common to the Great Lakes area. Algae and aquatic plants as indicators of environmental change. Field trips required.

431. Comparative Limnology
Summer, 4 credits
P: W.K. Kellogg Biological Station. R: BOT 105 or BS 111 or LBS 144, LBS 145.
Physical, chemical, and biological aspects of lakes and streams, introduction to freshwater biology, and population and community ecology.

434. Plant Structure and Function
Fall of odd-numbered years, 4 credits
P: BOT 110, BS 111 or BOT 105, BOT 106 or LBS 144, LBS 145.
Plant anatomy from a structure and function perspective. The physiological, developmental, and ecological significance of cell types, tissue types, and meristems of vegetative and reproductive plant parts.

441. Plant Ecology
Fall, 3 credits
P: BOT 110, BS 111 or BOT 105, BOT 106 or LBS 144, LBS 145.
Plant anatomy from a structure and function perspective. The physiological, developmental, and ecological significance of cell types, tissue types, and meristems of vegetative and reproductive plant parts.

485. Tropical Biology
Spring, 3 credits
P: W.K. Kellogg Biological Station. R: BOT 105 or BS 111 or LBS 144. R: Completion of Tier 1 writing requirement.
Experiments illustrating principles of plant physiology and molecular biology. Advanced techniques such as agrobacterium mediated gene transfer, DNA cloning, enzyme linked immunosorbent assays (ELISA), protein and DNA electrophoresis.

485L. Field Tropical Biology
Spring, Summer, 2 credits
P: W.K. Kellogg Biological Station. R: Completion of Tier 1 writing requirement.
Experiments illustrating principles of plant physiology and molecular biology. Advanced techniques such as agrobacterium mediated gene transfer, DNA cloning, enzyme linked immunosorbent assays (ELISA), protein and DNA electrophoresis.
410. **Directed Studies**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.
R: Approval of department.
Directed study of published literature in an area of botany and plant pathology.

411H. **Honors Directed Studies**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Directed study of published literature in an area of botany and plant pathology.

412. **Undergraduate Research**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Completion of Tier 1 writing requirement. Approval of department.
Laboratory and/or field research in an area of botany and plant pathology.

413. **Senior Seminar**
Spring, 3(2-0). A student may earn a maximum of 4 credits in all enrollments for this course.
R: Completion of Tier 1 writing requirement.
A capstone experience that focuses on current developments and issues in plant biology. Scientific writing and oral presentation.

800. **Seminar in Plant Biology**
Fall, Spring. 1(1-0). A student may earn a maximum of 4 credits in all enrollments for this course.
R: Open only to graduate students.
Current research and approaches in plant biology.

801. **Seminar in Plant Pathology**
Fall, Spring. 1(1-0). A student may earn a maximum of 4 credits in all enrollments for this course.
R: Open only to graduate students.
Current research and approaches in plant pathology.

802. **Selected Topics in Botany**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students.
Current research and approaches in plant pathology.

803. **Selected Topics in Plant Pathology**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students.
Current research and approaches in plant pathology.

804. **Special Problems in Plant Pathology**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students.
Faculty directed individualized study of a selected problem.

805. **Special Problems in Physiology and Biochemistry**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students.
Faculty directed individualized study of a selected problem.

806. **Special Problems in Genetics and Molecular Biology**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students.
Faculty directed individualized study of a selected problem.

807. **Special Problems in Mycology**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students.
Faculty directed individualized study of a selected problem.

808. **Special Problems in Anatomy and Morphology**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students.
Faculty directed individualized study of a selected problem.

809. **Special Problems in Ecology, Systematics, and Evolution**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students.
Faculty directed individualized study of a selected problem.

810. **Current Concepts in Plant Pathology**
Spring, 3(0-2). P: BOT 405 or BOT 414 or BOT 415. Recent developments in botany.

811. **Epidemiology of Plant Diseases**
Spring of even-numbered years. 3(3-0) P: BOT 810. Study of populations of plant pathogens within populations of hosts as affected by the environment and human involvement.

812. **Ecology and Evolution in Aquatic Systems**
Summer. 4 credits. Given only at W.K. Kellogg Biological Station. Interdepartmental with Zoology, Fisheries and Wildlife. Approved by Zoology.
R: BOT 435. Experimental field studies of population and community ecology of freshwater lakes and streams. Emphasis on interactions among species and between biotic and abiotic factors.

823. **Flowering Plant Diversity**
Fall of odd-numbered years. 4(2-4) P: BOT 415. Evolutionary diversity of flowering plants. Family characteristics, patterns of distribution, systems of classification, evolutionary trends, economic importance.

824. **Principles and Methods of Plant Systematics**
Spring of even-numbered years. 4(2-4) P: BOT 823. Classification methods, quantification of evolutionary relationships, phenetic, phyletic molecular, and cladistic approaches.

825. **Tropical Biology: An Ecological Approach**
Spring, Summer. 8(0-8) P: Approval of department; application required.
The scientific and social dimensions of sustainable development in the tropics.

830. **Paleobotany**
Fall of even-numbered years. 3(2-3) Interdepartmental with Geological Sciences.
R: Open only to graduate students.
Survey of fossil plants: preservation, occurrence, geological relations, taphonomy, whole plant reconstruction, evolutionary history, and paleoecology.

842. **Application of Ecological Principles**
Spring. 2 credits. Given only at W.K. Kellogg Biological Station. A student may earn a maximum of 8 credits in all enrollments for this course.
R: Open only to graduate students.
Interdepartmental with Zoology.
R: Approval of department.
Workshops and discussions with experts from industry, regulatory agencies, conservation groups, and academia on application of basic ecology and evolutionary biology to real-world problems.

844. **Organelle Genetics**
Spring of odd-numbered years. 3(3-0) Interdepartmental with Zoology.

845. **Ecology and Evolution: the Interface**
Fall. 3(3-0) Interdepartmental with Zoology and Entomology. Administered by Zoology.
R: Open to students of both ecology and evolutionary biology.

847. **Advanced Mycology**
Spring of even-numbered years. 4(2-4) P: BOT 402. Systematics, identification, physiology, genetics, and molecular biology of plant pathogenic fungi.

849. **Evolutionary Biology**
Spring. 3(3-0) Interdepartmental with Zoology.
P: BOT 541. STT 422 or concurrently. C: STT 422. Major conceptual, theoretical and empirical questions in evolutionary biology. Readings and lectures are synthesized in student discussions and on paper.