Plant Biology

Plant Biology is the study of all aspects of plants including their diversity, anatomy, physiology, biochemistry, genetics, evolution, conservation, and ecology. The need for botanical expertise is rapidly increasing in response to habitat loss, species extinctions, invasive species, and global climate change. Additionally, plants provide us with food, shelter, medicines, clothing, and many other products. Thus the demand for plant biologists will never diminish. A degree in Plant Biology will provide a strong foundation for a wide range of careers in plant biology, agriculture, conservation, environmental sciences, health-related fields, and other life science disciplines.

The Department of Plant Biology is one of only two such programs in Illinois. Our undergraduate curriculum has a number of features that insure our graduates' success 1) a flexible undergraduate curriculum that includes both B.A. and B.S. degrees, 2) practical experience and training in modern skills and research techniques, 3) a high degree of personalized faculty mentoring, 4) an atmosphere where undergraduate, graduate students, and faculty interact, and 5) ample opportunities for undergraduates to participate in outreach and service.

Bachelor of Arts in Plant Biology Degree Requirements

<table>
<thead>
<tr>
<th>Degree Requirements</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Core Curriculum Requirements †</td>
<td>39</td>
</tr>
<tr>
<td>College of Science Academic Requirements</td>
<td>7-9</td>
</tr>
<tr>
<td>Biological Sciences - completed with major Mathematics - 1-3</td>
<td></td>
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<tr>
<td>MATH 106 or MATH 108 and MATH 109; or MATH 111 (3 hours included in the UCC Mathematics hours)</td>
<td></td>
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<tr>
<td>Physical Sciences - completed with major Supportive Skills - 6</td>
<td></td>
</tr>
<tr>
<td>- CS 200B or CS 201 or CS 202; ENGL 290 or ENGL 291; MATH 282; or any two-semester foreign language sequence</td>
<td></td>
</tr>
<tr>
<td>Plant Biology Major Requirements</td>
<td>55-57</td>
</tr>
<tr>
<td>BIOL 307</td>
<td>3</td>
</tr>
<tr>
<td>PLB 200, PLB 300, PLB 301I, PLB 320, PLB 360, PLB 408, PLB 480 (Three hours included in the UCC Life Science hours)</td>
<td>23</td>
</tr>
</tbody>
</table>
### Degree Requirements

<table>
<thead>
<tr>
<th>Course Details</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 200 or CHEM 200H, CHEM 201, CHEM 202 or CHEM 202H (Three hours included in the UCC Physical Science hours)</td>
<td>2</td>
</tr>
<tr>
<td>One additional semester of physical science with laboratory at the 200-level or above from CHEM, GEOG, or PHYS</td>
<td>3-5</td>
</tr>
<tr>
<td>Disciplinary Electives chosen in consultation with the student’s undergraduate faculty advisor</td>
<td>24</td>
</tr>
<tr>
<td>Options available are: General Plant Biology (default if Conservation Biology option is not chosen)</td>
<td></td>
</tr>
<tr>
<td><strong>Conservation Biology</strong></td>
<td></td>
</tr>
<tr>
<td>PLB 451</td>
<td>3</td>
</tr>
<tr>
<td>PLB 493A, B, or C for at least 1 credit</td>
<td>1</td>
</tr>
<tr>
<td>ZOOL 410</td>
<td>3</td>
</tr>
<tr>
<td>At least 13 hours chosen from PLB 444; FOR 202, FOR 341, FOR 351, FOR 413, FOR 415, FOR 423, FOR 451; GEOG 401, GEOG 412, GEOG 428, GEOG 471; ZOOL 444</td>
<td>13</td>
</tr>
<tr>
<td><strong>Additional PLB Electives</strong></td>
<td>4</td>
</tr>
<tr>
<td>Free Electives</td>
<td>15-20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>120</td>
</tr>
</tbody>
</table>

1 The 39-hour requirement may be reduced by taking College of Science or major requirements that are approved advanced University Core Curriculum courses.

### Bachelor of Science in Plant Biology Degree Requirements

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<tr>
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</tr>
<tr>
<td>Biological Sciences - completed with major</td>
<td></td>
</tr>
<tr>
<td>Mathematics - MATH 106 or MATH 108 and MATH 109; or MATH 111 (3 hours included in the UCC Mathematics hours)</td>
<td>1-3</td>
</tr>
<tr>
<td>Physical Sciences - completed with major</td>
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<tr>
<td>Supportive Skills - CS 200B or CS 201 or CS 202</td>
<td></td>
</tr>
<tr>
<td>ENGL 290 or ENGL 291; MATH 282; or any two-semester sequence of a foreign language.</td>
<td>6</td>
</tr>
</tbody>
</table>

### Plant Biology Major Requirements

<table>
<thead>
<tr>
<th>BIOL 211, BIOL 212, BIOL 213</th>
<th>61-63</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3 hours included in the UCC Life Science hours)</td>
<td>9</td>
</tr>
<tr>
<td>BIOL 304, BIOL 305, BIOL 306, BIOL 307 (three of the four)</td>
<td>9</td>
</tr>
<tr>
<td>PLB 300, PLB 320, PLB 360, PLB 408, PLB 480</td>
<td>19</td>
</tr>
<tr>
<td>CHEM 200 or CHEM 200H, CHEM 201, CHEM 202 or CHEM 202H</td>
<td></td>
</tr>
<tr>
<td>(Three hours included in the UCC Physical Science hours)</td>
<td>2</td>
</tr>
<tr>
<td>Three additional semesters of laboratory at the 200-level or above from Chemistry and/or Physics</td>
<td>12-15</td>
</tr>
<tr>
<td>MATH 141</td>
<td>4</td>
</tr>
<tr>
<td>Disciplinary Electives chosen in consultation with the student’s undergraduate faculty advisor</td>
<td>16</td>
</tr>
</tbody>
</table>

Options available are:

- **General Plant Biology**
  - 16 credit hours and at least one course from each of the specializations listed below:

- **Ecology Specialization**
  - BIOL 304 and BIOL 307 are required from the list above
  - At least 12 credit hours chosen from: PLB 416, PLB 435, PLB 440, PLB 443, PLB 444, PLB 445, PLB 451, PLB 452 | 12 |
  - Additional PLB electives. | 4 |

- **Molecular and Biochemical Physiology**
Degree Requirements

BIOL 305 and BIOL 306 are required from the list above.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLB 419</td>
<td>3</td>
</tr>
</tbody>
</table>

At least 9 credit hours chosen from PLB 400, PLB 425, PLB 427, PLB 438, PLB 471, PLB 475, PLB 476 | 9 |

Systematics and Biodiversity Specialization

BIOL 304 and BIOL 307 are required from the list above.

At least 12 credit hours chosen from PLB 400, PLB 401, PLB 402, PLB 415, PLB 438, PLB 451, ZOOL 405 | 12 |

Free Electives | 10-14 |

Total | 121 |

1 The 39-hour requirement may be reduced by taking College of Science or major requirements that are approved advanced University Core Curriculum courses.

General Minor

A general minor in plant biology consists of a minimum of 16 semester hours, selected from any plant biology offerings except University Core Curriculum courses (PLB 115, PLB 117, PLB 301I and PLB 303I) and PLB 360, PLB 390, PLB 490, or PLB 492.

Tracked Minors

A. Plant Biology, with emphasis in Plant Biodiversity: Consists of 16 credit hours selected from the courses listed below:
   PLB 300, PLB 304, PLB 451, PLB 400, PLB 415, PLB 406.

B. Plant Biology, with emphasis in Plant Ecology: Consists of 16 credit hours taken from the list of courses below.
   BIOL 307, PLB 304, any three of the following courses:
   PLB 435, PLB 440, PLB 443, PLB 444, PLB 445, or PLB 452.

C. Plant Biology, with emphasis in Plant Biotechnology: Consists of 16 credit hours from the following courses:
   BIOL 305, BIOL 306, PLB 320, PLB 419, PLB 425, PLB 427, PLB 433, or PLB 471.

Plant Biology Courses

PLB115 - General Biology 115-3 General Biology. (University Core Curriculum) (Same as ZOOL 115) [IAI Course: L1 900L] Introduction to fundamental biological concepts for non-life science majors interested in learning about interrelationships of human, plant and animal communities. Integrated lecture and laboratory cover topics that include structure and function of living systems, reproduction...
and inheritance, evolution, biological diversity and environmental biology. Laboratory applies scientific methods to the study of living systems. Lab fee: $15.

**PLB117 - Intro to Ethnobotany** 117-3 Introduction to Ethnobotany and Economic Botany. (University Core Curriculum) [IAI Course: L1 901L] A multidisciplinary approach to understanding the relationships between plants and humans: basic botanical principles (cell structure, morphology, anatomy, physiology, genetics, systematics, diversity and ecology); historical and modern uses of plant (fibers, building materials, crops, beverages, medicines), poisonous plants, an Observational and experimental labs reinforce lecture topics. Lab fee: $15.

**PLB200 - General Plant Biology** 200-4 General Plant Biology. (Advanced University Core Curriculum course) An introduction to Plant Biology. Emphasis is placed on structure and reproduction, embryo development, and vital developmental processes needed for plant survival, such as photosynthesis, respiration, water transport and nutrient assimilation. Other topics include cell division, basic Mendelian genetics, DNA, RNA, protein synthesis, taxonomy, evolution, ecology, and conservation. The course also includes a brief overview of medicinal plants and their biologically active compounds. Satisfies University Core Curriculum Science Group II requirement in lieu of PLB 115 or ZOOL 115. Lab fee: $15.

**PLB300 - Plant Diversity** 300-4 Diversity of Plants, Algae, and Fungi. This course surveys the history and diversity of algae, land plants, and fungi-branches of the tree of life that are of immense importance both to the ecosystem and to human interests. Emphasis is on evolution, ecology, symbiotic relationships, life cycles, and adaptive morphology. Three lectures and one 2-hour laboratory per week. Prerequisite: either BIOL 213 or PLB 200 with a grade of C or better. Lab fee: $50.

**PLB301I - Environmental Issues** 301I-3 Environmental Issues. (University Core Curriculum) Fundamental biological and ecological processes important in the individual, population and community life of organisms integrating with the philosophical and ethical relationships of the contemporary, domestically diverse human society are examined. Emphasis is placed on a pragmatic understanding of environmental issues. Lab fee: $15.

**PLB303I - Evolution & Society** 303I-3 Evolution and Society. (University Core Curriculum: Students with a catalog year prior to Summer, 2012 only) An introduction to the basics of biological evolution and the effect of biological evolution on society. Historical and modern interpretations of biological evolution on the human experience will be developed. This will include legal, political, religious, scientific, racist, sexist, philosophical and educational aspects. Topics will be covered via discussions, presentations, papers and debates. Prerequisite: strongly recommend completion of University Core Curriculum Science requirements. Lab fee: $15.

**PLB317 - Intro to Medical Botany** 317-4 Introduction to Medical Botany. A survey of plants affecting human health and how they are used historically and in modern times, with emphasis on the biologically active constituents. Laboratory experiments will introduce students to techniques in production, isolation, chemical analysis and biological testing of medical compounds from plants. Two lectures and 4 hours of laboratory per week. Prerequisites: BIOL 200A and BIOL 200B or BIOL 211, BIOL 212, and BIOL 213, CHEM 140A or CHEM 200 and CHEM 201. Lab fee: $25.

**PLB320 - Plant Physiology** 320-4 Elements of Plant Physiology. The processes used by plants to meet their basic needs and to control growth and development. Three lectures and two laboratory hours per week. Prerequisite: BIOL 211 and BIOL 213 or PLB 200; CHEM 200 and CHEM 201 with grades of C or better. Lab fee: $50.

**PLB330 - Forensic Botany** 330-3 Forensic Botany. Exploration of the use of botanical evidence in forensic investigations. Students will learn how botanical evidence is identified, collected, and analyzed in criminal cases. How ‘real’ are Hollywood forensics cases that use plants? Students will read critique legal case studies and the current scientific literature. There will be a field trip to the State Crime Lab. Prerequisite: At least one of the following life science courses with lab: BIOL 200A, BIOL 200B, BIOL 211, BIOL 212, BIOL 213, PLB 200, PLB 117, PLB 115, or ZOOL 115. Field trip fee: $15.

**PLB351 - Ecological Methods** 351-3 Ecological Methods. (Same as ZOOL 351) Basic ecological field techniques for analysis of community structure and functional relationships. Two 4-hour laboratories per week. Prerequisite: BIOL 307. Laboratory/field trip fee: $25.
PLB360 - Introductory Biostatistics 360-3 Introductory Biostatistics. (Same as ZOOL 360) Introduction to basic statistical concepts and methods as applied to biological data. Includes descriptive techniques such as measures of central tendency, variability, hypothesis testing, analysis of variance and simple linear regression and correlation. Analysis of computer generated output and report writing required. This course does not fulfill the College of Science Biological Sciences requirement. Prerequisite: MATH 108.

PLB380 - Sophomore Seminar 380-2 Sophomore Seminar. This course provides professional development, career guidance, discussion of current topics and research, and development of oral and written communication skills. The course will consist of a variety of activities, discussions, and guest speakers that will cover a broad array of science-related career paths (graduate school, science education, government agencies, and biotech/private industry), orientation to research opportunities in the Plant Biology Department, development of a polished CV/resume for graduate school or a job application, development of written and oral communication skills, introduction to reading primary research literature.

PLB390 - Readings in Plant Biology 390-1 to 3 Readings in Plant Biology. Individually assigned readings in botanical literature. Every semester. Special approval needed from the departmental chair.

PLB400 - Plant Anatomy 400-4 Plant Anatomy. This course is an introduction to the differentiation, diversification and structure of plant tissues and organs, with emphasis on the organization of seed plants. Laboratory will include instruction in the techniques of microscopy used in the study of plant structure. Two lectures and two laboratories per week. Prerequisite: BIOL 213 or PLB 200 with grades of C or better. Lab fee: $50.

PLB401 - Curation of Collections 401-2 Curation of Collections. This course will be an introduction to the curation of biological collections and strongly involve experiential learning through participatory activities with collections. This will involve an overview of museums, collection procedures, and the long-term features of high quality curation of specimens and will examine how a broad range of organisms is curated. Lab/Field trip fee: $50.

PLB402 - Collections Management 402-2 Collections Management and Research Design. This course will build on the knowledge of collection curation. Research design as it specifically relates to the fields of natural history will be developed. Students will learn to utilize existing organismal collections and build their own research collections through directed research design. Students will be expected to write their own research proposal and to review other students’ proposals. Prerequisite: PLB 401.

PLB408 - Plant Systematics 408-4 Elements of Plant Systematics. This course covers the principles of plant classification including history, nomenclature, specimen collection and preservation, current systematic methodologies, and a survey of major plant families. Two lectures and four hours of lab per week. Prerequisites: BIOL 213 or PLB 200 with grades of C or better. Lab fee: $50.

PLB415 - Plant Morphology 415-5 Morphology of Vascular Plants. This course examines the external form, internal structure, and relationships of vascular plants. Three lectures and two laboratories per week. Prerequisite: BIOL 213 or PLB 200 with a grade of C or better (PLB 300 and PLB 400 recommended). Lab fee: $40.

PLB416 - Limnology 416-3 Limnology. (Same as ZOOL 415) Lakes and inland waters; the organisms living in them, and the factors affecting these organisms. Two lectures and one 4-hour laboratory alternate weeks. Prerequisite: BIOL 307 with a grade of C or better. Laboratory/Field Trip Fee: $15.

PLB419 - Plant Molecular Biology 419-3 Plant Molecular Biology. (Same as PSAS 419, CSEM 419) A survey of molecular phenomena unique to plant systems. Topics will include: genome organization and synteny between plant genomes, transcriptional and post-transcriptional control of gene expression, signal transduction, epigenetics, plant-pathogen interactions and responses to biotic- and abiotic-stresses. Prerequisite: BIOL 305 or CSEM 305. Restricted to junior standing.

PLB425 - Environmental Plant Phys 425-4 Environmental Physiology of Plants. (Same as CSEM 425; Same as PSAS 425) The environmental physiology of plants focuses on the 1) influence of abiotic factors (e.g., light, water, temperature, nutrients, pollutants) on growth, development, and yield; 2) mechanisms by which plants respond to these abiotic factors; 3) use of biotechnology to increase abiotic stress.
tolerance in model and crop plants. Prerequisite: PLB 320 or CSEM 409. A $35 laboratory fee will be assessed.

PLB427 - Plant Biochemistry 427-5 Plant Biochemistry. (Same as CSEM 427 and PSAS 427) Exploration of fundamental biochemical pathways in plants with an emphasis upon carbon and nitrogen metabolism. Prerequisite: PLB 320 or consent of instructor. Lab fee: $35.

PLB433 - Intro to Ag Biotechnology 433-3 to 7 Introduction to Agricultural Biotechnology. (Same as AGSE 433, ANS 433, CSEM 433, HORT 433, PSAS 433) This course will cover the basic principles of plant and animal biotechnology using current examples; gene mapping in breeding, transgenic approaches to improve crop plants and transgenic approaches to improve animals will be considered. Technology transfer from laboratory to marketplace will be considered. An understanding of gene mapping, cloning, transfer, and expression will be derived.

PLB435 - Plant-Insect Interactions 435-3 Plant-Insect Interactions. (Same as ZOOL 435) Plants and insects have played major roles influencing each other's evolutionary diversification. This course will be an evolutionary and ecological examination of the interactions between plants and insects. Topics will include herbivory, pollination relationships, ant-plant mutualisms, host plant choice, seed and fruit dispersal, coevolution/cospeciation, and chemical ecology. Prerequisite: BIOL 307 with a grade of C or better or equivalent.

PLB438 - Molecular Genetics Lab 438-3 Plant and Animal Molecular Genetics Laboratory. (Same as AGSE 438, CSEM 438, PSAS 438, ZOOL 438) Arabidopsis and Drosophila model organisms, lab-based training in laboratory safety, reagent preparation, phenotype analysis, genetics, DNA and RNA analysis, PCR, cDNA construction, cloning and sequencing of genes. Includes plant and bacterial transformation, and a population level analysis of genetic variation using RAPD markers in grasses and Alu insertion in humans. Two 2-hr labs and one 1-hr lecture per week. Prerequisite: BIOL 305 or equivalent or consent of instructor. Lab fee: $30.

PLB440 - Grassland Ecology 440-3 Grassland Ecology. This course examines grassland structure and function in relation to various biotic and abiotic factors. Field trips will visit local grasslands. Two lectures and one 4-hour lab per week. Prerequisite: BIOL 307 or consent of instructor. Lab fee: $50.

PLB443 - Restoration Ecology 443-3 Restoration Ecology. (Same as ZOOL 443) Ecological restoration tests current understanding of ecosystem assembly and function. This course applies ecological theory to restoration, with an emphasis on factors influencing plant community assembly and evaluating restoration success. Two lectures a week and one four-hour lab alternate weeks. Prerequisite: BIOL 307.

PLB444 - Ecological Analysis Communities 444-4 Ecological Analysis of Communities. (Same as ZOOL 444) Includes concepts and methods pertaining to the analysis of ecological data. Approaches will include a variety of methods for analyzing multivariate ecology, diversity, pattern, and spatial data. Laboratory will include the computer application of these concepts and methods to field situations. Two lectures and one 4 hour lab per week. Prerequisite: PLB/ZOOL 360, BIOL 307. Lab fee: $15.

PLB445 - Wetland Ecology & Mgmt 445-4 Wetland Ecology and Management. (Same as ZOOL 445) This course provides students with experience in wetland ecology and management with an emphasis on wetland functioning, field sampling, and identification of common wetland plants. Prerequisite: BIOL 307 with a grade of C or better. Two lectures and one 4-hour lab per week. Lab fee: $25.

PLB451 - Flora of Southern Illinois 451-3 Flora of Southern Illinois. Exposure to the major upland and lowland communities of southern Illinois with an emphasis on the identification, distribution and ecology of the natural and introduced floristic components. This is a field-based course wherein the students travel to local areas for plant identification. Each week, 4-8 hours per weekly session is spent in field work and travel to specific field sites is required via a university vehicle. Prerequisite: PLB 408 with a grade of C or better or consent of instructor. Field Trip Fee not to exceed $160.

PLB452 - Plant Population Ecology 452-4 Plant Population Ecology. This course covers principles and research techniques of plant population ecology including the spatial, age, size and genetic structures of plant populations. The origin of these different aspects of population structure, their influences upon
each other and their temporal dynamics are also examined. Two lectures and one 4-hour lab per week. Prerequisite: BIOL 307 or consent of instructor. Lab fee: $35.

**PLB471 - Intro to Systems Biology** 471-3 Introduction to Systems Biology. (Same as ZOOL 472) The bioinformatic analysis of large genomic and post-genomic data sets. Integration of gene regulation, protein interaction, metabolite and hormonal signaling provides an understanding of basic cellular circuitry networks. Examine redundancy, robustness and decision making in biological systems. Lab includes databases, tools, and manipulation of large data sets. Prerequisite: BIOL 305 or CS 330. Lab fee: $15.

**PLB475 - Advanced Cell Biology** 475-3 Advanced Cell Biology. Cell structure at molecular and cytological levels. Includes discussions of research methods, plasma membrane, cell exterior and recognition, the endomembrane system and related organelles, self-replicating organelles, the cytoskeleton, nuclear structure and function in cell replication, cell differentiation and response, and eukaryotic cell evolution. Prerequisite: BIOL 306 or equivalent.

**PLB476 - Advanced Cell Biology Lab** 476-2 Advanced Cell Biology Laboratory. Laboratory course to accompany Plant Biology 475. Light and electron microscopy, cell culturing, biochemical methods, and experimental protocols are used to study the structure of cell membranes, intracellular organelles, including the Golgi apparatus, ER, mitochondria, plastids, lysosomes, the cytoskeleton, and nucleus. Prerequisite: PLB 475 or concurrent enrollment.

**PLB480 - Senior Seminar** 480-1 Senior Seminar. Reading, writings, discussions and presentations of current research topics in plant biology. Not for graduate credit. Restricted to senior standing or consent of instructor.

**PLB490 - Food Webs and Ecosystems** 490-3 Energetics, Food Webs, and Ecosystems. (Same as ZOOL 490) This course places conservation of particular species into the context of community and ecosystem management. Approaches to quantifying energy needs of individual species will be extended to models of trophic networks among multiple species. Food web structure and function, species interactions, and resilience to species loss species invasions, and environmental changes will be examined in light of landscape processes. Prerequisite: BIOL 307 or consent of instructor.

**PLB492 - Honors in Plant Biology** 492-2 to 6 Honors in Plant Biology. Individual research problems available to qualified juniors and seniors. Special approval needed from the department chair.

**PLB493A - Research Topics PI Biol-Ecology** 493A-1 to 4 Research Topics in Plant Biology-Ecology. Individual laboratory or field research under supervised direction. Does not count for thesis (PLB 599) or dissertation (PLB 600) credit. Special approval needed from the departmental chair.

**PLB493B - Res Topics PI Biol-Systematics** 493B-1 to 4 Research Topics in Plant Biology-Systematics. Individual laboratory or field research under supervised direction. Does not count for thesis (PLB 599) or dissertation (PLB 600) credit. Special approval needed from the departmental chair.

**PLB493C - Res Top PI Biol-Physlgy/Mol Bi** 493C-1 to 4 Research Topics in Plant Biology-Physiology/ Molecular Biology. Individual laboratory or field research under supervised direction. Does not count for thesis (PLB 599) or dissertation (PLB 600) credit. Special approval needed from the departmental chair.


**PLB502B - Scanning Electron Microscp Lab** 502B-2 Research Scanning Electron Microscopy Lab. (See SCI 502B)
PLB520 - Plant Growth & Development 520-3 Plant Growth and Development. (Same as PSAS 520) Physiological control of developmental processes. Emphasis on exogenous growth-regulating compounds and their behavior in plants. Prerequisite: PLB 320 or consent of instructor.

PLB524 - Gene Regulatory Networks 524-3 Gene Regulatory Networks. (Same as PSAS 524) An examination of the integration of genes into networks including developmental, abiotic stress response, metabolic and photoreceptor gene regulatory networks. Includes motif discovery, cis-regulatory elements, discussion of transcription factor families, RNA interference, network theory, feedback loops, cytoplasmic inheritance, maternal effect, post-transcriptional and post-translational regulation. Includes 2 lectures and a 2 hr computational bioinformatics lab per week. Prerequisite: PLB 471 or permission of instructor.

PLB525 - Cell Biology Research Techniques 525-2 to 16 (2 to 4, 2 to 4, 2 to 4, 2 to 4) Cell Biology Research Techniques. A special techniques course designed for graduate students specializing in cell studies. Provides instrumentation training, with emphasis on application of the method to a research project. (a) Quantitative Cytology. (b) Immuno-Labeling and Qualitative Histochemistry. (c) Deep Etching Techniques in Electron Microscopy. (d) Cell Fractionation and Biochemical Techniques. Course fee: $50.

PLB525A - Cell Biology Research Techniques-Quantitative Cytology. A special techniques course designed for graduate students specializing in cell studies. Provides instrumentation training, with emphasis on application of the method to a research project.

PLB525B - Cell Biology Research Techniques-Immuno-Labeling and Qualitative Histochemistry. A special techniques course designed for graduate students specializing in cell studies. Provides instrumentation training, with emphasis on application of the method to a research project.

PLB525C - Cell Biology Research Techniques-Deep Etching Techniques in Electron Microscopy. A special techniques course designed for graduate students specializing in cell studies. Provides instrumentation training, with emphasis on application of the method to a research project.

PLB525D - Cell Biology Research Techniques-Cell Fractionation and Biochemical Techniques. A special techniques course designed for graduate students specializing in cell studies. Provides instrumentation training, with emphasis on application of the method to a research project.

PLB530 - Plant Ecophysiology 530-3 Plant Ecophysiology (Same as PSAS 530) A study of the physiological processes that influence the growth, reproduction, adaptation, and geographic distribution of plants. The ecophysiology of plant stress and plant interactions. Prerequisite: PLB 320 or CSEM 409; BIOL 307.

PLB535 - Energetic Aquatic Ecosystems 535-2 Energetic Aquatic Ecosystems. Special approval needed from the instructor.

PLB545 - Ecosystem Ecology 545-3 Ecosystem Ecology. (Same as ZOOL 545) Fundamentals of and human modification to atmospheric chemistry and cycling of major nutrients in terrestrial ecosystems are covered in the context of global change. Laboratory exercises provide methodology and analytical approaches to studying ecosystem structure and function. Two lectures a week and one four-hour lab alternate weeks.

PLB546 - Nutrient Cycling Methods 546-2 Nutrient Cycling Methods. Research in ecosystem ecology requires a basic understanding of biochemistry. Analytical methodology used to study pools and transformations of major nutrients in terrestrial ecosystems, applicable to freshwater systems, will be the focus of this laboratory course. Three hour laboratory every other week. Prerequisite: PLB 545 or concurrent enrollment. Course fee: $30.

PLB547 - Tropical Studies Costa Rica 547-3 to 8 Tropical Studies in Costa Rica. Credit for field courses taken under the jurisdiction of the Organization for Tropical Studies in Costa Rica. Courses and credits will vary. Prerequisite: approval of OTS Advisory Committee at Southern Illinois University Carbondale.
PLB554 - Evolution Seminar 554-1 to 4 (1,1,1,1) Evolution Seminar. (Same as ANTH 554, MBMB 554) Advanced topics in evolutionary biology including genetics & development, evolutionary ecology, phylogeny, paleontology, biogeography, population genetics, molecular ecology, speciation, molecular evolution, and macroevolution. Topics will vary each semester. Seminar format group discussions and student presentations. Graded S/U. Special approval needed from the instructor.

PLB556 - Phylogenetics 556-3 Phylogenetics. (Same as ANTH 556, MBMB 556, ZOOL 556) An advanced introduction to modern methods of phylogenetic inference, emphasizing both theoretical background concepts and numerical approaches to data analysis. Topics include properties of morphological and molecular characters, models of character evolution, tree estimation procedures, and tree-based testing of evolutionary hypothesis. Special approval needed from the instructor.

PLB557 - Biostatistics 557-4 Biostatistics. (Same as ZOOL 557) Basic biostatistical procedures used by researchers in life sciences and related fields. Topics include descriptive statistics, probability and distributions, statistical models, likelihood methods, experimental design, analysis of variance, regression, correlation, and the use of statistical software.

PLB558 - Advanced Biostatistics 558-4 Advanced Biostatistics. (Same as ZOOL 558) Advanced biostatistical procedures used by researchers in life sciences and related fields. Topics include multiple and logistic regression, randomization tests, jackknife and bootstrap. Mantel tests, BACI designs, MANOVA, repeated measures analysis, and the use of statistical software. Prerequisite: PLB 557 or equivalent, ZOOL 557.

PLB570 - Grad Readings Plant Biology 570-2 to 3 Graduate Readings in Plant Biology. A course of individually assigned readings in botanical literature. Every semester. Special approval needed from the instructor. Graded S/U only.

PLB571 - Genomics Euk: Bioinformatics 571-4 Genomics of Eukaryotes: Bioinformatics. (Same as PSAS 571) Genomics, Proteomics and Bioinformatics are rapidly making important contributions to the Life Science through biotechnology. An appreciation of the genomic tools is important to all in agriculture and biology. The relationships between molecular biology bioinformatics and the biotechnology industry will be explored. Short independent practical projects in genomics, proteomics or bioinformatics will be pursued.

PLB578 - Population Genetics 578-3 Population Genetics. (Same as ZOOL 578) Genetic structure of populations, factors causing changes and principles governing rate and direction of change. Three lectures per week. Prerequisite: BIOL 304 and BIOL 305.

PLB580 - Departmental Seminar 580-1 to 6 Departmental Seminar. Student presentations and critiques of original research, including presentations by occasional invited speakers. Graded S/U only. Required of all graduate students in residence, when offered.

PLB589A - Sem in Plant Biology-Ecology 589A-1 to 12 (1 per topic per semester) Seminars in Plant Biology-Ecology. (Same as ZOOL 576) Discussions of current and historical research and literature in various subject areas of plant biology. Graded S/U only.

PLB589B - Seminar Plb-Molec/Bioc Physl 589B-1 to 12 (1 per topic per semester) Seminars in Plant Biology-Molecular and Biochemical Physiology. Discussions of current and historical research and literature in various subject areas of plant biology. Graded S/U only.

PLB589C - Sem Plb-Systmcs & Biodvrsity 589C-1 to 12 (1 per topic per semester) Seminars in Plant Biology-Systematics and Biodiversity. Discussions of current and historical research and literature in various subject areas of plant biology. Graded S/U only.

PLB590 - Introduction to Research 590-1 Introduction to Research. General introduction to research and graduate program policies. Guest presentations by department faculty. Fall only. Graded S/U only. Required of all graduate students during their first year in residence, when offered.

PLB591A - Research - Anatomy 591A-2 to 9 Research-Anatomy. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.
PLB591B - Research - Bryology 591B-2 to 9 Research-Bryology. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.

PLB591C - Research - Ecology 591C-2 to 9 Research-Ecology. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.

PLB591D - Research - Morphology 591D-2 to 9 Research-Morphology. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.

PLB591E - Research - Mycology 591E-2 to 9 Research-Mycology. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.

PLB591F - Research - Paleobotany 591F-2 to 9 Research-Paleobotany. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.

PLB591G - Research - Pathology 591G-2 to 9 Research-Pathology. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.

PLB591H - Research - Photography 591H-2 to 9 Research-Photography. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.

PLB591I - Research - Phycology 591I-2 to 9 Research-Phycology. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.

PLB591J - Research - Physiology 591J-2 to 9 Research-Physiology. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.

PLB591K - Research - Systematics 591K-2 to 9 Research-Systematics. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Summer only. Graded S/U. Special approval needed from the instructor and the department.


PLB600 - Dissertation 600-1 to 36 (1 to 12 per semester) Dissertation. Course to be taken in the research for and in writing of the doctoral dissertation. Every semester. Graded S/U only. Special approval needed from the instructor.

PLB601 - Continuing Enrollment 601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded S/U or DEF only.

PLB699 - Postdoctoral Research 699-1 Postdoctoral Research. Must be a Postdoctoral Fellow. Concurrent enrollment in any other course is not permitted.

Plant Biology Faculty

Anterola, Aldwin M., Associate Professor, Ph.D., Washington State University, 2001.
Ashby, William C., Professor, Emeritus, Ph.D., University of Chicago, 1950.
Baer, Sara G., Professor, Ph.D., Kansas State University.
Battaglia, Loretta L., Associate Professor, Ph.D., University of Georgia, 1998.
Bozzola, John J., Professor, Emeritus, Ph.D., Southern Illinois University, 1975.
Crandall-Stotler, Barbara C., Professor, Emerita, Ph.D., University of Cincinnati, 1968.
Gage, Karla, Assistant Professor, Ph.D., Southern Illinois University, 2013.
Geisler, Matthew J. B., Associate Professor, Ph.D., The Ohio State University, 1999.
Gibson, David J., Distinguished Professor, Ph.D., University of Wales-Bangor, 1984.
Matten, Lawrence C., Professor, Emeritus, Ph.D., Cornell University, 1965
Mohlenbrock, Robert H., Distinguished Professor, Emeritus, Ph.D., Washington University, 1957.
Neubig, Kurt M., Assistant Professor, Ph.D., University of Florida, 2012.
Nickrent, Daniel L., Professor, Emeritus, Ph.D., Miami University, Ohio, 1984.
Renzaglia, Karen S., Professor, Ph.D., SIUC, 1981.
Richardson, John A., Associate Professor, Emeritus, M.F.A., Ohio University, 1969.
Robertson, Philip A., Professor, Emeritus, Ph.D., Colorado State University, 1968.
Sipes, Sedonia D., Associate Professor, Ph.D., Utah State University, 2001.
Tindall, Donald R., Professor, Emeritus, Ph.D., University of Louisville, 1966.
Vitt, Dale H., Distinguished Professor, Emeritus, Ph.D., University of Michigan, 1970.
Wood, Andrew J., Professor, Ph.D., Purdue University, 1994.
Yopp, John H., Professor, Emeritus, Ph.D., University of Louisville, 1969.

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