degree cannot be completed. The student's advisory committee decides whether the master's degree is an appropriate alternative to the Ph.D. degree. This decision may be made at the end of the student's first year of residence or at other times in the student's career, particularly at the time of the qualifying examination.

Course Descriptions

All Biomedical Sciences courses are listed and described under Biomedical Sciences.

Further information regarding graduate studies in Biomedical Sciences may be obtained from the Division of Biomedical Sciences.

Botany and Plant Sciences

Subject abbreviation: BPSC
College of Natural and Agricultural Sciences

Mikeal L. Roose, Ph.D., Chair
Department Office, 2132 Batchelor Hall
Graduate Student Affairs (800) 735-0717 or (951) 827-5688
Undergraduate Advising Center

(951) 827-3579; **plantbiology.ucr.edu**

Professors
Edith B. Allen, Ph.D. *Community/Restoration Ecology*
Julia N. Bailey-Serres, Ph.D. *Genetics*
Xuemei Chen, Ph.D. *Plant Cell and Molecular Biology*
Timothy J. Close, Ph.D. *Genetics*
Norman C. Ellstrand, Ph.D. *Genetics*
Exequiel Ezcurra, Ph.D. *Ecology*
Jodie S. Holt, Ph.D. *Plant Physiology*
Anthony H. C. Huang, Ph.D. *Plant Cell and Molecular Biology*
Bai-Lian "Larry" Li, Ph.D. *Ecology*
Carol J. Lovatt, Ph.D. *Plant Physiology*
Adam J. Lukaszewski, Ph.D. *Genetics*
Eugene A. Nothnagel, Ph.D. *Plant Physiology*
Natasha Raikhel, Ph.D., *Distinguished Professor of Plant Cell Biology; Ernst and Helen Leibacher Chair; Plant Cell Biology*
Mikeal L. Roose, Ph.D. *Genetics*
J. Giles Waines, Ph.D. *Genetics*
Linda L. Walling, Ph.D. *Genetics*
Susan Wessler, Ph.D. *Distinguished Professor of Genetics*
Shizhong Xu, Ph.D. *Genetics*
Zhenbiao Yang, Ph.D. *Plant Biology*

Professors Emeriti
Charles W. Coggins, Jr., Ph.D.
Darleen A. DeMason, Ph.D. *Botany*
Arturo Gómez-Pompa, Ph.D.
Anthony E. Hall, Ph.D.
Robert L. Heath, Ph.D. *Plant Physiology and Biophysics*
Charles K. Labanauskas, Ph.D.
Elizabeth M. Lord, Ph.D. *Botany/Developmental Biology*
Rainer W. Scora, Ph.D.
William W. Thomson, Ph.D.
Irwin P. Ting, Ph.D.

Associate Professors
Sean Cutler, Ph.D. *Plant Cell Biology*
Thomas A. Eulgem, Ph.D. *Plant Cell Biology*
Thomas Girke, Ph.D. *Bioinformatics*
Venugopala R. Gonehal, Ph.D. *Plant Cell Biology*
Darrel Jenerette, Ph.D. *Landscape Ecology*
Louis Santiago, Ph.D. *Physiological Ecosystems*
Patricia S. Springer, Ph.D. *Genetics*

Assistant Professors
Jeffrey Diez, Ph.D. *Community Ecology*
Renyi Liu, Ph.D. *Evolutionary Genomics*
**

Lecturers
Mary Lu Arpaia, Ph.D. *Subtropical Horticulture*
James Baird, Ph.D. *Turfgrass Horticulture*
David A. Grantz, Ph.D. *Agronomy and Plant Physiology*
Peggy A. Mauk, Ph.D., *Subtropical Horticulture*
Milton E. McGiffen, Jr., Ph.D. *Vegetable Crops/ Plant Physiology*
Alan McHughen, Ph.D. *Plant Biotechnology*
Donald J. Merhaut, Ph.D. *Horticulture and Floriculture*

Affiliated Emeritus
Junji Kumamoto, Ph.D. (Chemist Emeritus)

Cooperating Faculty
Michael Allen, Ph.D., (Plant Pathology and Microbiology)
Hailing Jin, Ph.D (Plant Pathology and Microbiology)
Isgouhi Kaloshian, Ph.D. (Nematology)
Joel Sachs, Ph.D. (Biology)

Major

The mission of the interdepartmental Undergraduate Program in Plant Biology is to provide students with a solid background in modern principles and research practices of basic Plant Biology and in their area of specialization.

Courses prerequisite to the major, courses used to satisfy major requirements, and the 16 units (for B.S. degree) related to the major must be taken for letter grades. Students may elect to take other courses on a Satisfactory (S)/ No Credit (NC) basis. Refer to the Academic Regulations section of this catalog for additional information on "S/NC" grading.

Information about this program is available from the CNAS Academic Advising Center (1223 Pierce Hall, Monday through Friday, 9 a.m. to noon and 1 to 4 p.m., [951] 827-7294).

Transfer Students

Students planning to transfer to UCR with a major in Plant Biology must have a minimum GPA of 2.7 in transferable college courses and "C" or higher grades in a year sequence of general chemistry and in courses equivalent to our BIOL 005A, BIOL 005B. We also recommend that transfer students complete a year of college calculus before admission. Exceptions may be granted by the faculty advisor.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

Major Requirements

The major requirements for the B.S. and B.A. degrees in Plant Biology are as follows:

1. Life Sciences core requirements (68-72 units)

   Students must complete all required courses with a grade of "C-" or better and with a cumulative GPA in the core courses of at least 2.0. Grades of "D" or "F" in two core courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.

   a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C

   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, CHEM 112A, CHEM 112B, CHEM 112C

   c) MATH 008B or MATH 009A, MATH 009B (MATH 009C recommended)

   d) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC

   e) STAT 100A

   f) BCH 100 or BCH 110A (BCH 110A is strongly recommended)

   Note for the B.S. degree, courses in Statistics and Biochemistry taken as part of the core may count toward the 16 units from an area of specialization. For the B.A. degree, courses in Statistics and Biochemistry taken as part of the core may not count toward the 12 units required from an area of specialization.

2. Upper-division requirements (40–52 units)

   A GPA of at least 2.0 in upper-division courses taken in the field of the major is a graduation requirement. A student is subject to discontinuation from the major whenever the GPA in upper-division course work is below 2.0. Students finding themselves in this circumstance must meet with an advisor.

   a) BIOL 102

   b) BPSC 104/BIOL 104 (may be waived with consent of the faculty advisor)

   c) BIOL 132/BPSC 132, BIOL 143/BPSC 143, BPSC 133

   d) At least 8 units for B.S. or 4 for B.A. from the following:
   BIOL 100/ENTM 100, BIOL 120/MCBL 120/PLPA 120, BIOL 120L/MCBL 120L/ PLPA 120L, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 123/MCBL 123/ PLPA 123, BIOL 124/MCBL 124, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L, BIOL 159/NEM 159, BPSC 134/ENSC 134, ENSC 120/NEM 120, ENTM 124

   e) Two (2) units of BPSC 195H, BPSC 197, BPSC 198-I, or BPSC 199

   f) BPSC 193 with a grade of C- or better

   g) **For the B.S.** 16 additional units from one of the four areas of specialization (consult with a faculty advisor) and additional upper-division courses in biological sciences and related areas from any of the areas of specialization lists, and students may apply a maximum of 6 units of BPSC 190 and/or BPSC 195H and/ or BPSC 197 and/or BPSC 198-I and/or BPSC 199. Requirements a) through g) must be at least 52 units in total.

   For the B.A. 12 additional units from one

of the four areas of specialization (consult with a faculty advisor).

Note Students planning a B.A. degree should schedule the required language courses in place of a series of electives.

Areas of Specialization

Individual student career goals may be achieved by selecting an area of specialization within the diverse disciplines of botany and plant sciences. Adjustments within these programs can be made to accommodate students' interests. Students must consult with a faculty advisor to clarify educational goals and to plan a program of study.

1. Plant Cellular, Molecular, and Developmental Biology
   a) BPSC 135
   b) Additional units from the following to meet either the B.S. or B.A. requirement: BCH 102,BCH 110B, BCH 110C or BIOL 107A, BCH 153/BIOL 153/BPSC 153, BCH 162, BCH 183/BPSC 183, BIOL 107B, BIOL 113, BIOL 114, BIOL 121/ MCBL 121, BIOL 121L/MCBL 121L, BIOL 123/MCBL 123/PLPA 123, BIOL 155/ BPSC 155, BIOL 168, BPSC 138/BIOL 138, BPSC 185, CBNS 101, CBNS 108
2. Plant Genetics, Breeding, and Biotechnology
   a) BPSC 150
   b) Additional units from the following to meet either the B.S. or B.A. requirement: BCH 153/BIOL 153/BPSC 153, BIOL 105, BIOL 107A, BIOL 107B, BIOL 108, BIOL 119, BIOL 148/BPSC 148, BIOL 155/ BPSC 155, BPSC 135, BPSC 158, BPSC 185, CBNS 108, STAT 100B
3. Ecology, Evolution, and Systematics
   a) BPSC 146
   b) Additional units from the following to meet either the B.S. or B.A. requirement: ANTH 170/BPSC 170, BIOL 105, BIOL 108, BIOL 112/BPSC 112/ENTM 112, BIOL 116, BIOL 116L, BIOL 138/BPSC 138, BIOL 165/BPSC 165, BPSC 134/ ENSC 134, BPSC 158, BPSC 166, BPSC 185, ENSC 100, GEO 151, GEO 153, GEO 169
4. Plant Pathology, Nematology, and Pest Management
   a) BIOL 120/MCBL 120/PLPA 120
   b) Additional units from the following to meet either the B.S. or B.A. requirement: BCH 183/BPSC 183, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 124/ MCBL 124, BPSC 146, BPSC 150, BPSC 158, BPSC 166, ENSC 134/BPSC 134, ENTM 100/BIOL 100, ENTM 109, ENTM 124, ENTM 127/BIOL 127, ENTM 129, ENTM 129L, ENSC 100, ENSC 120/NEM 120, NEM 159/BIOL 159, PLPA 120L/ BIOL 120L/MCBL 120L, PLPA 123/BIOL 123/MCBL 123, PLPA 134/BIOL 134, PLPA 134L/BIOL 134L, ENSC 104

Minor

The minor in Plant Biology allows students majoring in other departments to obtain in-depth training in Plant Biology.

Requirements for the minor in Plant Biology are as follows:

1. BIOL 104/BPSC 104 (4 units)
2. One course (4–5 units) from the following: BIOL 132/BPSC 132, BIOL 138/ BPSC 138, BIOL 143/BPSC 143, BPSC 133
3. Twelve (12) to 20 units from the following: ANTH 170/BPSC 170, BCH 153/BIOL 153/ BPSC 153, BCH 183/BPSC 183, BIOL 132/ BPSC 132, BIOL 138/BPSC 138, BIOL 143/ BPSC 143, BIOL 148/BPSC 148, BIOL 155/ BPSC 155, BIOL 165/BPSC 165, BPSC 133, BPSC 134/ENSC 134, BPSC 135, BPSC 146, BPSC 150, BPSC 158, BPSC 166, BPSC 190, BPSC 195H, BPSC 197, BPSC 198-I, BPSC 199, PLPA 120/BIOL 120/MCBL 120

Note No more than 4 units of BPSC 190–199 may be used to fulfill this requirement. The course used to fulfill the requirement in 2. cannot also be used to fulfill the requirement in 3.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Graduate Program

The Department of Botany and Plant Sciences offers programs leading to the M.S. degree in Plant Biology with two tracks, Botany or Plant Science, and a program leading to Ph.D. degrees in Plant Biology or Plant Biology (Plant Genetics)*. Research in these programs can focus on basic and/or applied questions.

Admission Applicants who have a baccalaureate degree and who satisfy the general requirements of the university listed in the Graduate Studies section of this catalog are considered for admission to graduate status. Students applying to the Ph.D. program and domestic applicants to the M.S. program must submit GRE General Test scores (verbal, quantitative, and analytical).

Regardless of the area of their major for the baccalaureate degree, students must have had, or complete soon after entering graduate school the following:

1. A year of course work in general biology and general chemistry
2. A course in genetics, biochemistry, and calculus
3. Two courses in physics and/or statistics.

Credit from these courses does not count toward the graduate degree.

Immediately after being admitted, each student should identify a faculty advisor and consult with that advisor or the graduate advisor regarding educational goals; scheduling initial course work and possible lab rotations; and forming a guidance committee. Further guidance on these matters is provided in the Botany and Plant Sciences Graduate Student Handbook.

Master's Degree

The Department of Botany and Plant Sciences offers programs leading to the M.S. degree in Plant Biology with tracks in Botany or Plant Science.

The master's degree may be earned under Plan I (Thesis) or Plan II (Comprehensive Examination). Students must meet all general requirements of the Graduate Division. The detailed course program is determined by the guidance committee after considering the specific interests of the student. Department requirements are as follows:

Plan I (Thesis)

1. Three courses from Section I of either the Botany track or the Plant Science track M.S. list
2. Two courses from Section II. In fulfilling the Section II requirement, students may use no more than one course cross-listed by Botany and Plant Sciences and another program. If such a cross-listed course is used toward fulfilling the Section II requirement, the same course may not be used toward fulfilling the Section I or III requirements.
3. At least 6 units from Section III of either the Botany track or Plant Science track M.S. list
4. Preparation of a thesis (not more than 12 units from Section V may apply toward the degree)

If the student takes research courses from Section IV, not more than 6 units may be applied toward the degree. Students who have taken courses comparable to those in Section I during their baccalaureate training may have a portion or all of this section waived. In such instances, however, it is expected that their programs include increased units in courses from Sections II, III, and/or IV. Recommendations for waivers should specify alternative courses and should be sent to the department educational advisory committee for approval.

Plan II (Comprehensive Examination)

1. Three courses from Section I of either the Botany track or Plant Science track M.S. list
2. Two courses from Section II. In fulfilling the Section II requirement, students may use no more than one course cross-listed by Botany and Plant Sciences and another program. If such a cross-listed course is used toward fulfilling the Section II requirement, the same course may not be used toward fulfilling the Section I or III requirements.
3. At least 12 units from Section III of either the Botany track or Plant Science track M.S. list
4. At least 6 units from Section IV for a research project or literature review, which should be described in a report to be submitted for evaluation by the comprehensive examination committee
5. Comprehensive written and oral examinations

Students who have taken courses comparable to those in Section I during their baccalaureate training may have a portion or all of this section waived. In such instances, however, it is expected that their programs include increased units in courses from Section II and/or III. Recommendations for waivers should specify alternative courses and should be sent to the educational advisory committee for approval.

Seminar Requirement All full-time students must enroll in the BPSC 250 seminar during each quarter in which it is offered. Part-time students must take one BPSC 250 seminar for every 12 units of courses. One quarter per year, students may enroll in an equivalent seminar course as a replacement for the BPSC 250 seminar course. All students must present at least one BPSC 250 seminar and complete at least two quarters of BPSC 240 (or equivalent).

Courses available for fulfilling the requirement for the M.S. degree:

Section I — Upper-division undergraduate courses:

Botany track ANTH 170/BPSC 170, BCH 153/BIOL 153/BPSC 153, BCH 183/BPSC 183, BIOL 104/BPSC 104, BIOL 112/BPSC 112/ENTM 112, BIOL 120/MCBL 120/PLPA 120, BIOL 132/BPSC 132, BIOL 134/PLPA 134, BIOL 138/BPSC 138, BIOL 143/BPSC 143, BIOL 155/BPSC 155, BIOL 165/BPSC 165, BPSC 133, BPSC 134/ENSC 134/, BPSC 135, BPSC 146, BPSC 148, BPSC 166

Plant Science track ANTH 170/BPSC 170, BCH 153/BIOL 153/BPSC 153, BCH 183/BPSC 183, BIOL 104/BPSC 104, BIOL 112/BPSC 112/ENTM 112, BIOL 120/MCBL 120/PLPA 120, BIOL 132/BPSC 132, BIOL 134/PLPA 134, BIOL 138/BPSC 138, BIOL 143/BPSC 143, BIOL 148/BPSC 148, BPSC 150, BIOL 155/BPSC 155, BIOL 165/BPSC 165, BPSC 133, BPSC 134/ENSC 134, BPSC 135, BPSC 146, BPSC 158, BPSC 166

Section II — Graduate and upper-division undergraduate courses in related departments or programs and professional development courses (i.e., BPSC 200A - BPSC 200B).Applicable courses are approved by the Graduate Educational Advisory Committee. A minimum of 6 units of course work is required. No more than 4 units may be from professional development classes.

Section III —

Botany track BCH 205/BPSC 205/CMDB 205/GEN 205/MCBL 205/PLPA 205, BCH 231/BPSC 231, BPSC 201 (E-Z) (for a maximum of 2 units), BPSC 210, BPSC 230, BPSC 232, BPSC 234, BPSC 237, BPSC 239, BPSC 240 (only if taken in addition to the required seminar units; see seminar requirement), BPSC 243, BPSC 245, BPSC 247

Plant Science track BCH 205/BPSC 205/CMDB 205/GEN 205/MCBL 205/PLPA 205, BCH 231/BPSC 231, BPSC 201 (E-Z) (for a maximum of 2 units), BPSC 221, BPSC 222, BPSC 232, BPSC 234, BPSC 237, BPSC 239, BPSC 240 (only if taken in addition to the required seminar units; see seminar requirement), BPSC 243, BPSC 245, BPSC 247

Section IV — Research courses: BPSC 290 and BPSC 297

Section V — Thesis research: BPSC 299, Thesis for Plan I

Normative Time to Degree 7 quarters

Doctoral Degree

The Department of Botany and Plant Sciences offers programs leading to the Ph.D. degree in Plant Biology.

The student must meet the general requirements of the Graduate Division.

Admission Either prior to entering the graduate program or before advancement to candidacy, students must have completed the equivalent of BPSC 104 and one other course from the core plant biology courses (BIOL 107A, BPSC 132, BPSC 135, BPSC 138, BPSC 143, BPSC 146). Course requirements for each student are determined by individual guidance committees and by the educational advisory committee. No later than the second quarter in residence, students meet with a guidance committee to (1) determine a course program to be submitted to the educational advisory committee,and (2) choose a major area of specialization and two minor areas.

Course Work Guidance committees and students should design individual course programs that meet the specific needs of the student and the requirements of the Ph.D. program. Course programs should prepare students for the qualifying examination and dissertation research. All first-year students must enroll in BPSC 200A and 200B during their first Fall and Spring quarters. Students must take a minimum of 12 additional graduate-level units relevant to the specialization. Graduate courses taken previously may be considered towards fulfilling this requirement. Students' course programs must be approved by the educational advisory committee. At the time of submission of course programs to the educational advisory committee, the area of specialization and two minor areas to be covered on the qualifying examination should be specified. Students may petition to change the course program, area of specialization, or minor areas at any time.

Students entering the Plant Biology Ph.D. program have four choices, as listed below. Students with a general interest in plant biology and/or evolution are encouraged to choose the first.

Ph.D. in Plant Biology Students who choose to obtain a Ph.D. in Plant Biology without one of the following concentrations are encouraged to – with the advice and consent of their Major Professor and Guidance Committee – create a set of coursework that is specifically tailored to their individual research interests and career objectives.

Students can also choose from one of three concentrations:

Ph.D. in Plant Biology (Concentration in Plant Cell, Molecular, and Developmental Biology) To earn the concentration in Plant Cell, Molecular, and Developmental Biology (appears on the transcript only), students must complete BPSC 231, BPSC 232, and BPSC 237. In addition, the required BPSC 240 course must be on a topic related to the concentration.

Ph.D. in Plant Biology (Concentration in Plant Ecology) To earn the concentration in Plant Ecology (appears on the transcript only), students must complete BPSC 245, and 8 additional units from the following list: EEOB 211, EEOB 212, EEOB 217, EEOB 230, BPSC 225J, BPSC 243, BPSC 247, ENTM 241, ENSC 218, ENSC 232, GEO 260, and GEO 268. In addition, the required BPSC 240 course must be on a topic related to the concentration.

Ph.D. in Plant Biology (Concentration in Plant Genetics) To earn the concentration in Plant Genetics (appears on the transcript only), students must complete 12 graduate-level units relating to Genetics. Required courses must include two courses from the following list: BPSC 221, BPSC 222, BPSC 225K, BPSC 231, BPSC 234, EEOB 214, BIOL 221/MCBL 221/PLPA 226, GEN 240A. The additional units can be chosen in an area that supports the concentration. In addition, the required BPSC 240 course must be on a topic related to the concentration.

Written and Oral Qualifying Examinations Advancement to candidacy depends on the student passing written and oral qualifying examinations. The qualifying examination covers the student's area of specialization and two minor areas. Granting of the degree is contingent upon acceptance of the dissertation by the candidate's dissertation committee and satisfactory oral defense of the dissertation.

Seminar Requirement All candidates must enroll in the BPSC 250 seminar during each quarter in which it is offered. The dissertation defense is normally presented in the BPSC 250 seminar series; however, if necessary, a special seminar may be scheduled for the defense. Also, students must present at least one BPSC 250 seminar in addition to the defense of the dissertation. All students must complete at least one quarter of BPSC 240 (or approved similar equivalent that involves substantial student presentations) during the Ph.D. program.

Professional Development Training Ph.D. graduate students must enroll in BPSC 200A and BPSC 200B to fulfill their professional development training requirement.

Foreign Language Requirement None

Teaching Requirement Students must obtain at least one quarter of teaching experience.

Normative Time to Degree 15 quarters

Normative Time to Candidacy 2 years

Lower-Division Courses

BPSC 011 Plants and Human Affairs (4) F Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction for nonscience and non-Botany majors to the importance of plants and plant products in the shaping of human affairs and civilization. Covers the origin and practice of agriculture; the utilization of plant products; the latest agricultural advances, including genetic engineering; and the current agricultural and social issues. Plants and plant products are examined during class demonstrations and exercises. **Close, Huang**

BPSC 021 California's Cornucopia: Food from the Field to Your Table (5) S Lecture, 3 hours; discussion, 1 hour; outside activities, 30 hours per quarter. Prerequisite(s): none. Examines California's diverse agricultural products. Addresses related contemporary issues such as crop improvement by biotechnology, climate change, pollution, resource use, and nutrition. Also examines how the interplay of geography, history, and culture shapes the cuisine of a region. **Ellstrand**

BPSC 031 Spring Wildflowers (4) S Lecture, 3 hours; laboratory, 3 hours; one saturday field trip. Prerequisite(s): none. General approach to the study of vegetative and floral features of plants as a means of identification and botanical classification of major plant families in Southern California. Secondary emphasis on the field biology of flowering plants. **Ezcurra**

BPSC 050 The Evidence for Evolution (4) W Lecture, 3 hours; extra reading, 3 hours. Introduces and explores the extensive evidence supporting evolution as the driver of biological diversity. Designed for non-science majors and/or those with limited prior knowledge about biology. Includes the scientific method, paleontology, natural selection, genetics, speciation, and the importance of sex. Addresses the broader need for scientific literacy in society. Letter Grade or Satisfactory/No Credit (S/NC); no petition required. Cross-listed with ENTM 050. **Ellstrand, White**

BPSC 097 Lower-Division Research (1-4) Individual study, 3-12 hours. Prerequisite(s): consent of instructor. Involves special research projects in plant biology performed under faculty supervision. Requires a final written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

Upper-Division Courses

BPSC 104 Foundations of Plant Biology (4) F, S Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C. A study of the plant world from cells to ecosystems. Examines the structure and function of organisms from the major plant groups and their role in the biosphere. The laboratory explores the unique properties of plants. Cross-listed with BIOL 104.

BPSC 112 Systematics (4) F Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C or equivalent. Principles and philosophy of classification. Topics include phylogenetic and phenetic methods, species concepts, taxonomic characters, evolution, hierarchy of categories, and nomenclature. Cross-listed with BIOL 112 and ENTM 112.

BPSC 132 Plant Anatomy (4) W Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A and BIOL 005B, or consent of instructor. Functional and developmental aspects of plant cell, tissue, and organ structure. Covers all aspects of the flowering plant life cycle from germination to pollination and fruit and seed development. Cross-listed with BIOL 132. **Springer**

BPSC 133 Taxonomy of Flowering Plants (5) S Lecture, 3 hours; laboratory, 3 hours; three 1-day saturday field trips. Prerequisite(s): BIOL 005C. Introduces the principles and methods of identifying, naming, and classifying flowering plants. Surveys selected flowering plant families in California and shows their interrelationships. **Waines**

BPSC 134 Soil Conditions and Plant Growth (4) W Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104 or ENSC 100; or consent of instructor. A study of the chemical, physical, and biological properties of soils and their influence on plant growth and development. Topics include soil-plant water relations; fundamentals of plant mineral nutrition; soil nutrient pools and cycles; soil acidity, alkalinity, salinity, and sodicity; root symbioses; and rhizosphere processes. Cross-listed with ENSC 134. **Crowley**

BPSC 135 Plant Cell Biology (4) W Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BCH 100 or BCH 110A; or consent of instructor. Explores concepts of dynamic plant cell structures and functions as revealed by modern technologies such as genetic manipulation and live-imaging of cellular structures and molecules. **Yang**

BPSC 138 Plant Developmental Morphology (4) Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BIOL 005C, CHEM 112C, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently), PHYS 002C, PHYS 002LC; or consent of instructor. Introduces the key areas of research in plant morphology and developmental biology. Emphasizes flowering plants (angiosperms). Cross-listed with BIOL 138. **Springer**

BPSC 143 Plant Physiology (4) F Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently), BIOL 104/BPSC 104; or consent of instructor. A survey of the fundamental principles of plant physiology including photosynthesis, respiration, water relations, mineral nutrition, growth, morphogenesis, plant hormones, dormancy, and senescence. Cross-listed with BIOL 143. **Santiago**

BPSC 146 Plant Ecology (4) F Lecture, 3 hours; laboratory, 18 hours per quarter; field trip, 12 hours per quarter. Prerequisite(s): BIOL 104/BPSC 104 or BIOL 116; STAT 100A; or consent of instructor. A study of the fundamentals of plant ecology. Emphasizes community ecology, environment, life histories, population dynamics, species interactions, succession, ecosystem and landscape ecology, and plant conservation ecology. **Allen**

BPSC 148 Quantitative Genetics (4) W Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C, BIOL 102, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A, STAT 100B; or consent of instructor. Examines approaches to studying the genetic basis of polygenic, metric traits. Includes types of gene action, partitioning of variance, response to selection, and inferring the number and location of quantitative trait loci. Cross-listed with BIOL 148. **Xu**

BPSC 150 Genes, Selection, and Populations (4) S Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102 with a grade of "C-" or better, upper-division standing; or consent of instructor. Considers the conscious manipulation of allelic frequencies in populations as the basis for domestication of crop and animal species. Examines the genetic basis and standard strategies for the improvement of targeted characteristics in populations of plants and animals through selection and introgression of specific genes and gene constructs. **Close, Lukaszewski**

BPSC 153 Plant Genomics and Biotechnology Laboratory (4) F, Even Years Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): BCH 110C or BIOL 107A; upper-division standing; consent of instructor. A study of modern techniques in plant genome modification. Topics include nucleic acid cloning and sequencing; plant tissue culture and genetic transformation; controlled-environment plant growth; gene mapping; and germplasm collections. Also explores the history of plant biotechnology; economic, agricultural, nutritional, medicinal, and societal relevance; and regulatory issues. Cross-listed with BCH 153 and BIOL 153.

BPSC 155 Chromosomes (4) S Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 02LC, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently); or consent of instructor. An examination of the structure, function, and behavior of eukaryotic chromosomes. Cross-listed with BIOL 155. **Lukaszewski**

BPSC 158 Subtropical and Tropical Horticulture (4) F, Even Years Lecture, 4 hours; occasional field trips. Prerequisite(s): BIOL 005C or BIOL 104/BPSC 104 or consent of instructor. Studies the important subtropical and tropical crops of the world, emphasizing fruits, including citrus and avocado, with special reference to their botany, germplasm resources, climatic adaptation, and culture. **Waines**

BPSC 165 Restoration Ecology (4) W Lecture, 3 hours; two 1-day field trips; three half-day field trips. Prerequisite(s): BIOL 104/BPSC 104 or BIOL 116 or ENSC 100; CHEM 112A; STAT 100A (STAT 100A may be taken concurrently); or consent of instructor. BIOL 102 and CHEM 112C are recommended. An examination of the basic ecological principles related to land restoration. Topics include enhanced succession, plant establishment, plant adaptations, ecotypes, weed colonization and competition, nutrient cycling, functions and reintroduction of soil microorganisms, restoration for wildlife, and the determination of successful restoration. Includes field trips to restored sites. Cross-listed with BIOL 165. **Allen**

BPSC 166 Plant Physiological Ecology (4) Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C or consent of instructor; university-level courses in mathematics, physics, and chemistry are recommended. Topics include plant responses to light, temperature, evaporative demand, and limiting soil conditions. Explores photosynthesis, plant-water relations, and plant-temperature relations. Gives attention to plant adaptation to climates with varying aridity and temperature extremes. **Santiago**

BPSC 170 Ethnobotany (4) Lecture, 2 hours; seminar, 1 hour; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104 or consent of instructor. Introduces students to ethnobotanical research by reviewing selected ethnobotanical studies. Topics covered by lectures include fundamental principles of ethnobotany, the search for new medicines and other products made from plants, the role of humans in plant evolution, and the impact of plants on human cultures. Discussions focus on the past and present role of humans in plant conservation and the search for sustainable management practices in agriculture and forestry. Seminars by invited guests and enrolled students present selected topics in ethnobotany. Cross-listed with ANTH 170.

BPSC 183 Plant Biochemistry and Pharmacology of Plant Metabolites (3) F Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B; or BCH 100; or consent of instructor. Explores plant biochemistry and the significance of plant metabolites in medicine and pharmacology. Focuses on biotechnology, medicinal plants, and plant-derived drugs as well as the biochemical and pharmacological mode-of-action of secondary plant metabolites. Also addresses plant-specific biochemical processes such as photosynthesis. Cross-listed with BCH 183. **Eulgem**

BPSC 185 Molecular Evolution (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 105 or BIOL 107A or consent of instructor; BIOL 108 is recommended. Explores the evolution of genes, proteins, and genomes at the molecular level. Focuses on the processes that drive molecular evolutionary change. Covers basic methodological tools for comparative and phylogenetic analyses of molecular data from an evolutionary perspective.

BPSC 190 Special Studies (1-5) F, W, S variable hours. Library, laboratory or field work designed to meet special curricular needs. A written proposal signed by the supervising faculty member must be approved by the major advisor and the Department Vice Chair. A written report must be filed. Course is repeatable, but total credit toward graduation may not exceed 6 units.

BPSC 193 Senior Seminar (2) W Seminar, 1 hour; lecture, 1 hour. Prerequisite(s): senior standing in Plant Biology. Emphasizes thinking across hierarchical levels and understanding structure-function relationships in plant biology. Includes lectures by instructors and presentation of classical or landmark papers by students. Satisfactory (S) or No Credit (NC) grading is not available. **Allen, Roose**

BPSC 195H Senior Honors Thesis (1-4) Thesis, 3-12 hours. Prerequisite(s): upper division standing; admission to the University Honors Program or consent of instructor. Directed research and completion of a senior Honors thesis under the supervision of a faculty member. Course is repeatable to a maximum of 12 units.

BPSC 197 Research for Undergraduates (1-4) F, W, S Outside research, 3-12 hours. Prerequisite(s): upper-division standing; consent of instructor. Individual research conducted under the direction of a Botany and Plant Sciences faculty member. A written proposal must be approved by the supervising faculty member and undergraduate advisor. A written report must be filed with the supervising faculty member at the end of the quarter. Course is repeatable.

BPSC 198-I Individual Internship in Botany and Plant Sciences (1-12) Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): upper-division standing; consent of instructor. An off-campus internship related to plant biology. The student conducts the internship in the public or private sector but is jointly supervised by an off-campus sponsor and a faculty member in Botany and Plant Sciences. Requires an initial written proposal and a final written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

BPSC 199 Senior Research (2-4) F, W, S Laboratory, 6-12 hours. Prerequisite(s): senior status; a GPA of 3.2 or better in upper-division courses in Botany/Plant Science and Biology; or consent of instructor. Individual research on a problem relating to Botany/Plant Science. A written proposal signed by the supervising faculty member must be approved by the major advisor and the Department Vice Chair. A written report must be filed with the supervising faculty member. Course is repeatable, but total credit toward graduation may not exceed 9 units.

Graduate Courses

BPSC 200A Plant Biology Core (2) F Lecture, 1 hour; practicum, 3 hours. Prerequisite(s): graduate standing in Plant Biology or consent of instructor. Explores plant biology research approaches. Emphasizes critical thinking and advanced planning of hypothesis testing, as well as experimental/descriptive/theoretical caveats, trade-offs, and options. Presents topics in a case-study approach. Also addresses professional development. Graded Satisfactory (S) or No Credit (NC). **Walling**

BPSC 200B Plant Biology Core (2) S Lecture, 1 hour; practicum, 3 hours. Prerequisite(s): BPSC 200A. Builds on material covered in BPSC 200A. Focuses on creating complete grant proposals based upon the guidelines of an actual funding source. Presents topics in a case-study approach. Includes peer review of completed proposals. **Walling**

BPSC 201 (E-Z) Methods in Plant Biology (1-2) F, S, W Laboratory, 3-6 hours. Prerequisite(s): consent of instructor. Explores the theory and principles of instruments and laboratory techniques applicable to research in the plant sciences. Experiments provide experience in the use of laboratory instruments and techniques including applications and limitations. E. Plant Molecular Biology; F. Plant Ecology; G. Plant Systematics; I. Plant Microscopy; J. Plant Physiology; K. Plant Genetics; M. Plant Cell Biology; N. Plant Cytogenetics. Segments are repeatable as content changes.

BPSC 205 Signal Transduction Pathways in Microbes and Plants (4) S Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in the biological sciences, BIOL 107A or BIOL 113 or BIOL 114 or CBNS 101; or consent of instructor. Advanced topics in signal transduction pathways that regulate growth and development in plants and prokaryotic and eukaryotic microbes. Areas covered include two-component regulatory systems; quorum sensing; signaling via small and heterotrimeric G proteins; mitogen-activated protein kinase cascades; cAMP signaling; photoreceptors; plant hormone signaling; responses to low-oxygen stress; calcium signaling; and plant pathogenesis. Cross-listed with BCH 205, CMDB 205, GEN 205, MCBL 205, and PLPA 205.

BPSC 210 Methods In Arabidopsis Research (4) Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102; consent of instructor. A study of modern techniques used in Arabidopsis research. Topics include plant growth conditions, pest control, genetic crosses, chemical and insertional mutagenesis, genetic mapping techniques, nucleic acid isolation and manipulation, transformation, and internet resources.

BPSC 221 Advanced Plant Breeding (4) S, Even Years Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 148/BPSC 148 or consent of instructor; BPSC 150. Advanced treatment of plant breeding theory and practice including development and use of information on inheritance of traits; choice of breeding plans; breeding for yield, quality, and disease and stress resistance; and use of biotechnology. **Roose**

BPSC 222 Origins of Agriculture and Crop Evolution (3) W, Odd Years Lecture, 3 hours. Prerequisite(s): BIOL 102, BIOL 104/BPSC 104; or consent of instructor. Analysis of origins of agriculture in the Near East, China, the New World, and Africa. Survey of domestication and evolution of major crop plants and animals. **Waines**

BPSC 225 (E-Z) Advanced Topics in Plant Biology (2) F, W, S Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An in-depth examination of selected topics in plant biology. E. Agricultural Plant Biology; F. Plant Cell Biology; G. Plant Development; I. Plant Evolution and Systematics; J. Plant Ecology; K. Plant Genetics; M. Plant Molecular Biology; N. Plant Biochemistry and Physiology Each segment is repeatable as its content changes. **Springer**

BPSC 230 Molecular Plant-Microbial Interactions (3) F Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 120/MCBL 120/PLPA 120, or equivalents. A study of the physiology of host-pathogen interactions with emphasis on the metabolism of diseased plants, nature of pathogenicity, and defense mechanisms in plants. Cross-listed with CMDB 230, GEN 230, and PLPA 230.

BPSC 231 The Plant Genome (4) W Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 107A; or BCH 110A, BCH 110B, BCH 110C; or consent of instructor. Gives students an appreciation for the structure of the plant nuclear, chloroplast, and mitochondrial genomes. Gene structure, regulation of gene expression, transposons, and methods of gene introduction are also emphasized. Cross-listed with BCH 231. **Bailey-Serres, Eulgem, Walling**

BPSC 232 Plant Development (4) S Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102; BIOL 104/BPSC 104; or consent of instructor. An examination of plant development, with emphasis on the genetic mechanisms used in patterning plant forms. Topics are taken from current literature and focus on molecular and cellular mechanisms. **Gonehal**

BPSC 234 Statistical Genomics (4) F, Even Years Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102, STAT 231B; or consent of instructor. Examines statistical methods of genome analysis. Topics include screening for genetic markers, linkage analysis, linkage disequilibrium, and mapping genes for complex diseases and quantitative traits. Covers statistical techniques, including analysis of least squares and maximum likelihood, Bayesian analysis, and Markov chain Monte Carlo algorithm. **Xu**

BPSC 237 Plant Cell Biology (4) F Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 107A or BIOL 143/BPSC 143 or BCH 100 or CBNS 101 or their equivalents, or consent of instructor. Studies the structure, function, and dynamics of plant cell division, expansion, and specialization. Emphasis on aspects unique to plants including cytoskeletal and cell plate dynamics during cytokinesis; intracellular trafficking and wall-dynamics during expansion; and targeting to chloroplasts and vacuoles during specialization. **Raikhel, Yang**

BPSC 239 Advanced Plant Physiology (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 143/BPSC 143 or consent of instructor. Examines advances in plant physiology, with emphasis on carbon and nitrogen metabolism, mineral nutrition, solute transport and phloem translocation, plant growth regulators, and secondary compounds in relation to growth and development. **Lovatt**

BPSC 240 Special Topics in Plant Biology (2) F, W, S Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of current literature within special areas of plant science. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPSC 243 Plant Physiological Ecology (4) S Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 143/BPSC 143; BPSC 146 or equivalent; or consent of instructor. Analyzes adaptations and responses of plants to their environment, with emphasis on the physical environment, photosynthesis, temperature and water relations, growth and allocation, and plant interactions. **Santiago**

BPSC 245 Advanced Plant Ecology (4) F Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC; STAT 100B or equivalent; an undergraduate course in ecology; or consent of instructor. Explores the fundamental ecological concepts, theoretical developments, quantitative methods, and experimental results involved in multiscale plant ecological studies. Emphasizes plant strategies, vegetation processes, ecosystem properties, and terrestrial landscapes and their interaction with environmental change and human land use. **Li**

BPSC 246 Landscape Ecology (4) W, Even Years Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 116 or BPSC 146; STAT 100A; or consent of instructor. Introduces landscape ecology both as a sub-discipline of ecology and an interdisciplinary approach for environmental research. Includes identification of spatial patterns, pattern-process relationships, and scaling. Analyzes population, community, and ecosystem dynamics in connection with landscape functioning. Evaluates landscape theory and methods for applications in species conservation, pollution, and climate changes. **Jenerette**

BPSC 247 Ecological Theory and Modeling (4) Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): MATH 009C or MATH 09HC; STAT 100B or equivalent; an undergraduate course in ecology; or consent of instructor. Explores the fundamental ecological theory and modeling methodology with emphasis on the ecosystem and landscape levels. Synthesizes current research developments in the context of their classic works. **Li**

BPSC 250 Seminar in Plant Biology (1) F, W, S Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Intensive study of selected topics in plant biology. Includes lectures by students, faculty, and invited scholars on subjects related to the principles of plant biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BPSC 252 Special Topics in Botany/Plant Science (1) F, W, S Seminar, 1 hour. Prerequisite(s): graduate standing and consent of instructor. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each staff member. Course content will emphasize recent advances in the special topic area and will vary accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPSC 260 Seminar in Plant Physiology, Botany, or Genetics (1) W Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Lectures, discussions, and demonstrations by students, faculty, and invited scholars on selected subjects concerned with the principles of plant physiology, botany, or genetics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPSC 261 Seminar in Genetics, Genomics, and Bioinformatics (1) W, S Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, ENTM 261, GEN 261, and PLPA 261.

BPSC 290 Directed Studies (1-6) F, W, S Individual study, 3-18 hours. Prerequisite(s): consent of instructor. Library, laboratory, or field studies conducted under the direction of a faculty member. Designed to meet specific curricular needs in areas of plant biology not covered by formal course work and outside of required directed dissertation or thesis research. Not intended to replace BPSC 297 or BPSC 299. Students who complete assigned extra work receive letter grades; other students receive Satisfactory (S) or No Credit (NC) grades. Course is repeatable to a maximum of 42 units.

BPSC 291 Individual Study in Coordinated Areas (1-6) F, W, S Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for examinations. Up to 6 units may be taken prior to the master's degree. Up to 12 units may be taken prior to advancement to candidacy for the Ph.D. Graded Satisfactory (S) or No Credit (NC). Course is repeatable upon recommendation of the instructor.

BPSC 292 Concurrent and Advanced Studies in Botany and Plant Sciences (1-4) F, W, S Outside research, 3-12 hours. Prerequisite(s): consent of instructor. Elected concurrently with an appropriate undergraduate course, but on an individual basis. Devoted to one or more graduate projects based on research and criticism related to the course. Faculty guidance and evaluation is provided throughout the quarter. Course is repeatable.

BPSC 297 Directed Research (1-6) F, W, S Outside research, 3-18 hours. Prerequisite(s): graduate standing or consent of instructor. Individual research conducted under the direction of a Botany and Plant Sciences faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPSC 299 Research for Thesis or Dissertation (1-12) F, W, S Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

BPSC 302 Teaching Practicum (1-4) F, W, S Prerequisite(s): graduate standing and appointment as Teaching Assistant. Supervised teaching of Botany/Plant Science courses including laboratory and/or discussion sections. Graded Satisfactory (S) or No Credit (NC). Course is repeatable for credit, but units not applicable toward degree unit requirements.

Business Administration

Subject abbreviation: BUS
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Waymond Rodgers, Ph.D. (Accounting)
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Professors Emeriti
David Mayers, Ph.D. (Finance)
Kathleen Montgomery, Ph.D. (Organizations and Management)
David Stewart, Ph.D. *Distinguished Professor* (Marketing)

Associate Professor
Jorge Silva-Risso, Ph.D. (Marketing)

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Ye Li, Ph.D. (Management)
Yun Liu, Ph.D. (Finance)
Xing Pan, Ph.D. (Marketing)
Elaine Wong, Ph.D. (Management)

Majors

The B.S. in Business Administration is a two-year upper-division major offered by the School of Business Administration (SoBA). Students can enroll in a Pre-Business status and are advised in CHASS during their freshman and sophomore years. The Pre-Business curriculum includes the prerequisites to the major and the college breadth requirements. After admission to the major, students are advised by the SoBA through its Office of Undergraduate Programs located at 2340 Olmsted Hall. The B.S. degree in Business Administration is conferred by the SoBA.

The program is accredited by the AACSB International - The Association to Advance Collegiate Schools of Business.

Admission A limited number of students are accepted into the Business Administration major, chosen according to overall GPA. Students must apply for the major when they have completed not fewer than 75 and not more than 100 quarter units of college work. Final acceptance into the major is based on completion of all prerequisites and breadth requirements within a 100-quarter-unit limit, a GPA above 2.50 in major prerequisites, and cumulative GPA of at least 2.70. (Students who have not completed the foreign language breadth requirement may be accepted into the program, but they must complete the requirement before graduation.) Exceptions to the 100-quarter-unit maximum must be requested by petition.

UCR Students (excluding Pre-Business students) interested in changing major to Business Administration will be admissible to the Business Preparatory (BSPR), (which is not a major in UCR, but a holding group of transfer students who appear to be qualified for admission into business administration, but have some deficiencies which need to be completed before admission into business administration) status only if they can complete their deficiencies in breadth and/or major prerequisites within one quarter (the first quarter after admission into Bus-Preparatory).

The same rule will apply to students transferring in from a community college or a four-year school. In the event these students fail to meet this one quarter requirement, they will not be admitted into the BSPR category, and will be advised to find another major at UCR.

Students are encouraged to participate in at least one internship during their junior or senior year. Students interested in international business are encouraged to consider opportunities for study through the Education Abroad Program, which has centers affiliated with more than 150 institutions in 35 countries worldwide. For further details, visit UCR's Off Campus Academic Experiences at **eapoap.ucr.edu** or call (951) 827-2508.

Outstanding academic achievement is recognized by the awarding of the Delta Sigma Pi Scholarship Key to a graduating senior. Other awards, presented on an annual basis, include the Bank of America Business Leaders Scholarship, Deloitte and Touche Scholarship, Gordon Blunden/Provident Savings Bank Business Scholarship, and the Ernst & Young Scholarship.

Graduating seniors are also eligible for the School of Business Administration Award for Academic and Service Excellence, and also the SoBA Concentration Area Awards, which recognizes the student with the best overall performance in each concentration area.

University Requirements

See Undergraduate Studies section.

College Requirements

Students must fulfill all breadth requirements of the College of Humanities, Arts, and Social