

## BIOLOGICAL SCIENCES

*Head of the Department:* Professor Sever

*Professors:* Bond, Childers, Crother, Font, Guidroz, Keddy, Nelson, Norton, Sever, Shaffer, White

*Associate Professors:* Bancroft, Bossart, Dardis, Dunn, Howard, Miller, Piller, O'Reilly, Shockett

*Assistant Professors:* Guedry, Pendarvis, Stiller, Valverde, Watson

*Instructors:* Broussard, Campo, Fontenot, Gray, Harper

### BOTANY (BOT & BOTL)

**205. Introduction to Botany.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent. The biology of plants, emphasizing the ecology, evolution, morphology, and systematics of flowering plants. Two hours of lecture and four hours of laboratory per week.

**347. Vascular Plant Systematics.** Credit 4 hours. Prerequisites: GBIO 153 and BIOL 154 or equivalent and Sophomore standing, or permission of the Department Head. An introduction to the identification, naming, classification and evolution of vascular plants. Two hours of lecture and 4 hours of laboratory per week.

**401/501. Plant Pathology.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent and Junior standing or permission of the Department Head. A study of the nature and causes of disease in plants, emphasizing the principal diseases in Louisiana crops. Two hours of lecture and four hours of laboratory per week.

**426/526. Plant Physiology.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent, Chemistry 101/121-102/122 or equivalent and Junior standing permission of the Department Head. A study of the life processes of plants emphasizing plant water relations, photosynthesis, transport process, and interactions with the environment. Three hours of lecture and three hours of laboratory per week.

**427/527. Plant Stress Ecophysiology.** Credit 4 hours. Prerequisite: Botany 426/526 or equivalent and Junior standing or permission of the Department Head. An advanced course in plant physiology with emphasis on the stress physiology of plants in coastal and changing environments. Topics include non-destructive indicators of plant growth, nutrient stress, drought stress, salt stress, flooding stress, and plant responses to global change, such as increased carbon dioxide concentrations and temperature stress. Three hours of lecture and three hours of laboratory per week.

**433/533. Phycology.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent and Junior standing or permission of the Department Head. A study of the freshwater algae of southeastern Louisiana, emphasizing the ecology, taxonomy, and morphology of natural collections. Two hours of lecture and four hours of laboratory per week.

**458/558. General Mycology.** Credit 3 hours. Prerequisite: GBIO 153 and BIOL 154 and Junior standing or permission of the Department Head. A study of the morphology, taxonomy, and physiology of fungi. Two hours of lecture and two hours of laboratory per week.

**481/581 [382]. Plant Ecology.** Credit 4 hours. Prerequisites: GBIO 153 and BIOL 154 and Junior standing or permission of the Department Head. A study of plants in relationship to their environments, with examples from recent publications in autecology, physiological ecology, population biology and plant community ecology, and with experience in the vegetation and habitats of Louisiana. Two hours of lecture and four hours of laboratory per week.

**482/582. Plant Anatomy.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent and Junior standing or permission of the Department Head. A study of the anatomy and morphology of seed plants. Two hours of lecture and four hours of laboratory per week.

**671. Advanced Plant Taxonomy.** Credit 4 hours. A study of plant systematics with attention to the evolutionary development of plant groups. Two hour of lecture and four hours of laboratory per week.

### GENERAL BIOLOGY (GBIO & BIOL)

**106. Introduction to Biological Principles I.** Credit 3 hours. A survey of the fundamental principles and concepts of biology including biochemistry, cell biology, metabolism, photosynthesis, cell division, reproduction, genetics, molecular biology, development, evolution, and ecology. This would be the first course in a sequence which satisfies the General Education Sequence requirement in the Natural Sciences. Three hours of lecture per week. Persons majoring in Biology may not use this course to fulfill their major requirements. However, it may be used to fulfill an elective requirement and in calculating cumulative averages.

**107. Introduction to Biological Principles II.** Credit 3 hours. Prerequisites: GBIO 106 [111] or permission of the Department Head. A course which relates to the broad biological principles covered in GBIO 106 to specific groups of organisms. Emphasis will be placed on taxonomy, diversity, systems and architecture of these organisms. Three hours of lecture per week. Persons majoring in Biology may not use this course to fulfill their major requirements. However, it may be used to fulfill an elective requirement and in calculating cumulative averages.

**151. General Biology I.** Credit 3 hours. Prerequisites: Must be eligible to enroll in ENGL 101 and MATH 155 or 161. Principles of biology from the cellular level including biochemistry, cell biology, metabolism, photosynthesis, molecular biology, and genetics. This course is designed for students planning to major in biology or related discipline. Three hours lecture per week.

**151H. General Biology I Honors.** Credit 3 hours. Prerequisites: Must be eligible to enroll in ENGL 101, and authorization by the Director of the Honors Program. Principles of biology from the cellular level including biochemistry, cell biology,

metabolism, photosynthesis, molecular biology, and genetics. This course is designed for students planning to major in biology or related disciplines. Three hours lecture per week.

**152. General Biology Laboratory I.** Credit 1 hour. Prerequisite: Registration in or prior credit for GBIO 106 or GBIO 151. Laboratory exercises for studying the principles of biology from the cellular level including biochemistry, cell biology, molecular biology, and genetics. Two hours of laboratory per week.

**153. General Biology II.** Credit 3 hours. Prerequisite: Completion of GBIO 151 with a "C" or better. A systematic study of the structure, function, evolution, ecology and relationships of organisms including viruses, bacteria, protists, fungi, plants, and animals. This course is designed for students planning to major in biology or related disciplines. Three hours lecture per week.

**153H. General Biology II Honors.** Credit 3 hours. Prerequisite: Completion of GBIO 151H and authorization by the Director of the Honors Program. A systematic study of the structure, function, evolution, ecology and relationships of organisms including viruses, bacteria, protists, fungi, plants, and animals. This course is designed for students planning to major in biology or related disciplines. Three hours lecture per week.

**154. General Biology Laboratory II.** Credit 1 hour. Prerequisite: Registration in or prior credit for GBIO 107 or GBIO 153. Laboratory exercises for systematically studying the structure, function, evolution, ecology, and relationships of organisms including protists, fungi, plants and animals. Two hours of laboratory per week.

**200. Cell Biology.** Credit 3 hours. Prerequisites: GBIO 153, BIOL 154, and CHEM 122, or permission of the Department Head. A basic course emphasizing the study of the energetics of biological systems, including the manner in which cells obtain and expend energy: the synthesis and degradation of macromolecules with emphasis on proteins and nucleic acids. Three hours of lecture per week.

**203. Selected Topics in Biology.** Variable credit 1-4 hours. Prerequisite: Permission of the Department Head. Selected topics in biology that are new or unique and are not covered in existing courses. May be taken more than once for credit.

**241. The Profession of Biology or Getting What You Came For.** Credit 1 hour. Prerequisite: Major in Biology and credits for GBIO 151, 153 and BIOL 152. An Internet-based course designed to guide students in making appropriate and informed career plans in the biological sciences. Two hour of Internet learning per week. The course is graded pass/fail.

**281. Environmental Awareness.** Credit 3 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent. A broad spectrum study of the ecological problems of our society. Three hours of lecture per week.

**312. Genetics.** Credit 3 hours. Prerequisite: GBIO 200 or permission of the Department Head. Recommend: Completion of Math 161 or 164 and 162 and one course of Organic Chemistry. A study of fundamental hereditary mechanisms and relationships. Emphasis is placed on nucleic acids and the molecular and cytological roles by which genes are distributed and expressed.

**314. Genetics Laboratory.** Credit 2 hours. Prerequisite: Registration in or prior credit for General Biology 312. A series of experiments designed to illustrate the principles of genetics. Four hours of laboratory per week.

**341. Professional Aspects of Biology.** Credit 1 hour. Prerequisite, Major in Biology, Junior status or permission of Department Head. An introduction to learning in biological sciences beyond the usual classroom or laboratory setting. Specific sections may allow students to gain experience in conducting research in designated specialties or focus on aspects of the philosophy, ethics, and history of scientific research. May be repeated for up to two credits. Two hours of field learning per week.

**377. Applied Biostatistics.** Credit 4 hours. Prerequisite: Mathematics 161 or consent of the Department Head. Basic concepts of biostatistics and sampling strategy; measures of central tendency and dispersion; Z, t, chi-square, and F distributions; test of hypothesis, error rates, and maximizing power; analysis of variance and regression. Strong emphasis on, and many examples of, field and laboratory oriented biological research problems. Three hours of lecture and two hours of laboratory per week.

**395. General Ecology.** Credit 3 hours. Prerequisite: GBIO 153, BIOL 154, or permission of the Department Head. Biology majors must additionally be concurrently registered in GBIO 397. The biology of ecosystems: energy, patterns of ecosystems, and populations, interspecies interactions, diversity and development. Three hours of lecture per week.

**397. General Ecology Laboratory.** Credit 2 hours. Prerequisite: Registration in or prior credit for GBIO 395. A series of activities and exercises designed to illustrate ecological concepts and to introduce students to ecology as a scientific discipline. The course will include class excursions to natural habitats both on and off campus. Four hours of laboratory per week.

**404/504. Ecological Methods.** Credit 3 hours. Prerequisite: GBIO 377 and GBIO 395, or permission of the Department Head. An introduction to exploratory and experimental ecology with an emphasis on experimental design, sampling strategy, ecological indices, population dynamics, and simulation modeling. Two hours of lecture and two hours of laboratory per week.

**405/505. Evolutionary Biology.** Credit 4 hours. Prerequisite: GBIO 153, BIOL 154, and Junior Standing or permission of the Department Head. Knowledge of evolutionary concepts is fundamental to the understanding of biology. The theory of evolution unifies all of the disparate disciplines included within the life sciences. Microevolution explores processes occurring at or below the level of species, including mechanisms of inheritance, reproductive isolation, and speciation. Macroevolutionary concepts operating above the species level include palaeontology, biogeography, systematics, phylogeny, and an understanding of human origins. Four hours of lecture per week.

**406/506. Wetland Ecology.** Credit 4 hours. Prerequisite: GBIO 153, BIOL 154, and Junior standing, or permission of the Department Head. A study of wetland ecosystems considering productivity and salinity variations with an emphasis on the interface of aquatic and terrestrial environments. Two hours of lecture and four hours of laboratory per week.

**407/507. Forensic Biology.** Credit 4 hours. Prerequisite: GBIO 151 and GBIO 153, or permission of the department Head. An introduction to the use of biological information in civil and criminal in civil and criminal investigations of deceased humans and wildlife. Topics will include basic principles of human decomposition, forensic anthropology, botany, entomology, odontology, and pathology. Laboratory component will include mock crime scene scenarios, emphasizing methods and procedures for recovery of crime scene evidence, forensic entomology, and decompositions rates. Three hours of lecture and three hours of laboratory per week.

**409. Internship.** Credit 1-3. Prerequisites: Junior/Senior standing and permission of the Department Head. This course is designed to give students practical experience working with professionals in their chosen field. The student is responsible

for finding a sponsoring/professor and a professional with whom to work. Students earn one credit for 3 hours internship per week averaged over the term, up to a maximum of 3 credits for 9 averaged hours per week. Means of evaluation is determined by the sponsoring professor and the professional.

**418/518. Community Ecology.** Credit 4 hours. Prerequisite: GBIO 395. The study of ecological communities and the interactions of species that co-occur in time and space. The course will include the history of ideas, important examples, methods for data analysis, and casual factors associated with communities. Other topics covered will include succession, ordination, classification, competition, predation and mutualism. Three hours of lecture and three hours of laboratory per week.

**439/539. Introduction to Fresh Water and Estuarine Biology.** Credit 4 hours. Prerequisites: GBIO 153 and BIOL 154 or equivalent and Junior standing or consent of the Department Head. A consideration of fresh water lakes and streams and estuaries as biological habitats and of the organisms which inhabit these environments. Attention will be given to limnology and the ecology of these areas. Two hours of lecture and one four-hour laboratory per week.

**441. Biology Seminar.** Credit 1 hour. Prerequisite: Senior standing in Biology. A review of important concepts and current events in biological sciences. May be repeated for maximum credit of two hours. Additional hours will not be counted towards student's major or in the cumulative GPA average.

**442/542. Marine Biology.** Credit 4 hours. Prerequisites: GBIO 153 and BIOL 154 or equivalent and Junior standing or consent of the Department Head. A consideration of the sea as a biological environment, of the organisms which inhabit the sea, and of the interrelationships existing between marine organisms and the physical, chemical, and biological aspects of their environments. Two hours of lecture and four hours of laboratory per week.

**450. Research Problems.** Credit 1 to 4 hours. Prerequisite: Junior standing in Biology. May be repeated for maximum credit four hours. Additional hours will not be counted towards student's major or in the cumulative GPA average.

**481/581 Biogeography.** Credit 3 hours. Prerequisites: GBIO 153, BIOL 154, and Junior standing or permission of the Department Head. Examines the distribution of organisms. A study of the patterns and processes of organism distribution from theoretical and empirical perspectives. Three hours of lecture per week.

**485/585. Conservation Biology.** Credit 4 hours. Prerequisites: GBIO 153 and BIOL 154. Recommended: General Biology 312 and 395. An examination of threats and disruptions to biological systems from the level of populations through ecosystems to global systems. Emphasis on basic principles of ecology, evolution, and genetics as they apply to conservation theory and practice. Consideration will also be given to social, economic, and political aspects of biodiversity conservation and the role of various governmental and non-governmental organizations and research institutions. Three hours of lecture and three hours of laboratory per week.

**492/592. History of Biology.** Credit 3 hours. Prerequisite: GBIO 153, BIOL 154, and Junior Standing, or permission of the Department Head. A general survey of the historical development theories of biological sciences from early man to the present.

**493/593. Special Topics in Biology.** Credit variable, 2-4 hours. Selected topics in Biology that are new or unique and are not covered in existing courses. This course may be repeated for credit if different topics are studied.

**495/595. Biological Electron Microscopy.** Credit 4 hours. Prerequisite: Junior standing and consent of the Department Head. Methods of studying biological material with transmission electron microscopes; fixation, ultramicrotomy and cytochemistry; replica and shadowing; and other biological related procedures. Two hours of lecture and four hours of laboratory per week.

**498/598. Biological Science for Teachers.** Credit 3 hours. A course designed for secondary and/or primary school teachers. Emphasis will be placed on developing the underlying scientific principles being presented in the classroom. Three hours of lectures and demonstrations per week. Persons majoring in Biology may not use this course to fulfill their major requirements; however, it may be used to fulfill an elective requirement.

**603. Population Biology.** Credit 4 hours. A synthesis of population ecology, population genetics and evolution. Two hours of lecture and four hours of laboratory per week.

**609. Estuarine Ecology.** Credit 4 hours. A study of the estuary as an ecosystem with emphasis on the recent scientific literature on estuaries. Field studies on the Lake Maurepas/Lake Pontchartrain estuary. Two hours of lecture and four hours of laboratory per week.

**610. Biostatistics.** Credit 4 hours. Prerequisites: Math 161 or permission of the Department Head. An introductory course in the concept of biostatistics and sampling strategy. Topics covered include measures of central tendency and dispersion; Z, t, chi-square, and F distributions; experimental design, partitioning of variance, test of hypotheses, and maximizing power; analysis of variance and regression. Emphasis on field and laboratory research problems. Three hours of lecture and two hours of laboratory per week.

**611. Advanced Biostatistics.** Credit 4 hours. Prerequisites: GBIO 377 or 610 or permission of the Department Head. An advanced course in biostatistics that applies concepts, terminology, and notation from basic methods course(s) to advanced statistical techniques. Students will learn the major applications of experimental design, treatment arrangements analysis of covariance multiple regression, factor analysis, discriminant analysis, cluster analysis, and system modeling. Additional concepts will be developed such as blocking, covariables, nesting, pseudoreplication, confounding, repeated measures, types of sums of squares, and optimization. Three hours of lecture and two hours of laboratory per week.

**612. Limnological Methods.** Credit 3 hours. Prerequisites: GBIO 153 and BIOL 154 or equivalent, and Chemistry 122/124, permission of the Department Head. A course designed to acquaint the student with the methods and techniques for the collection and analysis of aquatic and microbiological samples. One hour of lecture and three hours of laboratory per week.

**615. Systematics.** Credit 3 hours. Prerequisites: Must be admitted to Master of Science Program, or permission of the Department Head. Studies in philosophy, theory, and methods employed in studying biodiversity. Phylogenetics is emphasized but alternatives are examined. Extensive computer time is required for the course. Three hours of lecture per week.

**616. Historical Ecology.** Credit 3 hours. Prerequisites: Graduate standing in biological sciences or permission of the Department Head. Currently active behavioral and ecological processes and systems all have a historical component. The historical component obfuscates the study of these processes and systems. This course examines the problem of history in studying contemporary processes and shows how to identify history by several methods. Three hours of lecture per week.

**652. Molecular Biology.** Credit 4 hours. Prerequisites: One year of organic chemistry, General Biology 200 and 312. A study of recent techniques and findings in the field of molecular biology. Practical experience is emphasized. Three hours of lecture and two hours of laboratory per week.

**655. Island Ecology.** Credit 3 hours. A study of oceanic islands as natural laboratories for ecology and evolution. Topics will include the relationships of plants and animals with their environment on continental and volcanic islands and the biological characteristics of species that permit or constrain colonization of islands. Establishment, adaptation, speciation, and extinction on islands are examined. Also included will be a discussion of biogeographic principles and taxonomic patterns of island biota. Three hours lecture per week.

**660. Graduate Research Problems.** Credit 1-2 hours per semester. Maximum credit two hours for thesis students. Additional hours will be graded on "Pass/Fail" basis and will not be counted toward student's major or in the cumulative GPA average. This course cannot be used for credit in the non-thesis option.

**661. Non-Thesis Graduate Research Problems.** Credit 1-4 hours. Research project for non-thesis graduate students. This course is required for all non-thesis graduate students. The course may be taken for variable credit in different semesters, but must be taken until the required four credits hours are earned. Requires prior approval of the Non-Thesis Research Agreement Form by the student's Graduate Faculty advisor and the Non-Thesis Committee.

**690. Special Topics in Biology.** Credit variable, 2-4 hours. Selected topics in Biology that are new or unique and are not covered in existing courses. This course may be repeated for credit if different topics are studied.

**691. Graduate Seminar.** Credit 1 hour. May be repeated for maximum credit of four hours. Additional hours will not be counted toward student's major or in the cumulative GPA average. One-two hours of seminar per week.

**770. Thesis.** Credit 1-6 hours each semester, with 6 hours needed for graduation. The student must enroll in the thesis course each semester the thesis is in progress. The thesis is graded Pass-Fail.

## MICROBIOLOGY (MIC & MICL)

**205. General Microbiology.** Credit 3 hours. Prerequisites: GBIO 151 and 153 or permission of Department Head and registration for or prior credit for Microbiology 207. A survey of the fundamental principles and concepts of the biology of microorganisms including biochemistry, cell biology, metabolism, photosynthesis, cell division, reproduction, genetics, molecular biology, development, evolution, ecology, and diversity as well as a survey of microbial infections and immunity to infectious diseases. For students majoring or minoring in Biology credit toward the degree will not be granted for both MIC 205 and 223. Three hours of lecture per week.

**207. General Microbiology Laboratory.** Credit 1 hour. Prerequisite: Registration for or prior credit for Microbiology 205 [105]. A survey of laboratory techniques used to study cellular morphology, growth, metabolism, and identification of bacteria. For students majoring or minoring in Biology credit toward the degree will not be granted for both Microbiology 207 and 224. Two hours of laboratory per week.

**223. Medical Microbiology.** Credit 3 hours. Prerequisite: GBIO 151 and BIOL 152 or permission of Department Head and registration in or prior credit for Microbiology 224. An introductory course in microbiology with emphasis on the medically important microorganisms and their relationship to disease and immunity. This course is designed primarily for students in Nursing and Allied Health curricula. For students majoring or minoring in Biology credit toward the degree will not be granted for both Microbiology 205 and 223. Additional hours will not be counted toward student's major or in cumulative GPA average. Three hours lecture per week.

**224. Medical Microbiology Laboratory.** Credit 1 hour. Prerequisite: Registration in or prior credit for Microbiology 223. A series of laboratory exercises designed to illustrate the material studied in Microbiology 223. For students majoring or minoring in Biology credit toward the degree will not be granted for both Microbiology 107 and 224. Two hours of laboratory per week.

**313. Microbial Ecology.** Credit 3 hours. Prerequisite: Microbiology 205 or permission of the Department Head. A study of the role of microorganisms in the flow of materials and energy through global ecosystems, and in transformation of organic and inorganic materials. The role of microorganisms in the major biogeochemical cycles, carbon, nitrogen, sulfur, and phosphorus will be covered. Three hours of lecture per week.

**325. Advanced General Microbiology.** Credit 4 hours. Prerequisite: Microbiology 205-207 or 223-224 or permission of Department Head. Advanced microbiological techniques; practices used in determinative microbiology. Two hours of lecture and four hours of laboratory per week.

**423/523. Environmental Microbiology.** Credit 4 hours. Prerequisite: Microbiology 205 or permission of the Department Head. A study of the application of modern microbiological concepts to water pollution, contamination of soil and atmosphere with the intent of understanding the complex microbial processes underlying environmental deterioration, its control and prevention. A major emphasis will be placed on water and wastewater management. Two hours of lecture and four hours laboratory per week.

**436/536. Pathogenic Bacteria.** Credit 4 hours. Prerequisite: Microbiology 205-207 or 223-224 and Junior standing or permission of the Department Head. A study of the major bacterial pathogens and their relationship to disease and immunity. The laboratory stresses techniques used in the isolation and identification of pathogenic bacteria. Two hours of lecture and four hours of laboratory per week.

**438/538. Soil Microbiology.** Credit 4 hours. Prerequisite: 205-207 or 223-224 and Junior standing. A study of soil microorganisms, the impact of environmental factors, and survey of the major nutrient transformations occurring in soil. Two hours of lecture and four hours of laboratory per week.

**457/557. Dairy and Food Microbiology.** Credit 4 hours. Prerequisite: Microbiology 325 or permission of Department Head. A study of beneficial, pathogenic and spoilage microorganisms associated with dairy and food microbiology. Two hours of lecture and four hours of laboratory per week.

**460/560. Immunology.** Credit 4 hours. Prerequisites: Microbiology 205-207 and GBIO 200. GBIO 312 recommended. An introduction to the biology of the immune system, including the genes, molecules, cells, and mechanisms that mediate immune recognition and response. Topics covered include innate and adaptive immunity, humoral and cellular components, lymphocyte development and activation, and immune effector mechanisms. A portion of the course will be devoted to the immune system in health and disease and will cover immune responses to infection, evasion strategies of various pathogens, vaccination, immune deficiency diseases (including AIDS), autoimmunity, and cancer. Emphasis will be placed on understanding the experimental basis of the field of immunology. Three hours of lecture and three hours of laboratory per week.

**461/561. Bacterial Metabolism.** Credit 4 hours. Prerequisite: Microbiology 205 or 223, or CHEM 265, and junior standing or permission of Department Head. A study of the metabolism as related to growth and energetics of eubacteria and archaeobacteria. Two hours of lecture and four hours of laboratory per week.

**463/563. Virology.** Credit 4 hours. Prerequisite: Microbiology 205-207, and GBIO 200. Introduction to molecular and cellular mechanisms mediating virus infection in bacteria, animals, and plants. Topics include specific virus life cycles, cellular and immune responses, evasion strategies, subviral entities, and viral evolution. Seminar component focuses on reading/discussion of classic and current virology research papers. Three hours of lecture and three hours of seminar per week.

**465/565. Recombinant DNA Techniques.** Credit 4 hours. Prerequisite: MIC 205 or 223, or CHEM 265, or GBIO 312, and junior standing or permission of Department Head. A study of the concepts and techniques involved in recombinant DNA research and their application to genetic analysis in bacterial model systems. Laboratories and designed to compliment and reinforce the lecture. Two hours of lecture and four hours of laboratory per week.

**610. Industrial Microbiology.** Credit 4 hours. Prerequisite: Microbiology 461/561 or equivalent. The use of microbes in industrial processes such as production of antibiotics, vitamins, and chemicals. Two hours of lecture and four hours of laboratory per week.

**615. Determinative Microbiology.** Credit 4 hours. Prerequisite: Microbiology 461/561 or consent of the Department Head. A study of the classification, identification and nomenclature of the 19 groups of bacteria. One hour of lecture and six hours of laboratory per week.

**640. Microbial Physiology.** Credit 4 hours. Prerequisite: Microbiology 461/561 or equivalent. A study of the relationships between structure and function of bacteria and allied organisms. Two hours of lecture and four hours of laboratory per week.

**650. Microbial Genetics.** Credit 3 hours. Prerequisite: Microbiology 461/561 or equivalent. The genetics of microorganisms with special emphasis on the molecular level.

## ZOOLOGY (ZOO & ZOOL)

**241. Human Physiology.** Credit 4 hours. Prerequisite: GBIO 151 and BIOL 152 or equivalent. A general study of functions in organ systems of the human. Three hours of lecture and two hours of laboratory per week. Persons majoring in Biology may not use this course to fulfill their major requirements; however, it may be used to fulfill an elective requirement.

**242. Principles of Human Biology.** Credit 4 hours. Prerequisite: GBIO 151 and BIOL 152 or equivalent. Principles of Human Biology has been primarily designed for students pursuing careers with curricula that require a single semester of human biology such as Kinesiology. The major areas of subject concentration are the muscular, cardiovascular, respiratory, nervous, and sensory systems. Biology majors may not use this course to fulfill their major requirements. However, it may be used to fulfill an elective requirement and in calculating cumulative and major averages. Three hours of lecture and two hours of laboratory per week.

**250. Human Anatomy and Physiology Lecture I.** Credit 3 hours. Prerequisites: GBIO 151 and BIOL 152 and registration in or prior credit for Zoology 252 or permission of the Department Head. Topics covered include: anatomical terminology and the structure and function of molecules, cells, tissues, and the integumentary, skeletal, muscular, nervous, and endocrine systems. Three hours of lecture per week. This course can not be used as a concentration elective for Biology majors; however, it may be used as a general elective.

**251. Human Anatomy and Physiology Lecture II.** Credit 3 hours. Prerequisites: ZOO 250 and registration in or prior credit for Zoology 253 or permission of the Department Head. Topics covered include: the structure and function of the cardiovascular, digestive, reproductive, respiratory, lymphatic, urinary, and excretory systems, energy & metabolism, and water & ion homeostasis. Three hours of lecture per week. This course can not be used as a concentration elective for Biology majors; however, it may be used as a general elective.

**252. Anatomy and Physiology Laboratory I.** Credit 1 hour. Prerequisites: Registration in or prior credit for Zoology 250. A series of laboratory exercises designed to illustrate the course material in Zoology 250. Two hours of laboratory per week. Persons majoring in Biology may not use this course to fulfill their major requirements; however, it may be used to fulfill an elective requirement.

**253. Anatomy and Physiology Laboratory II.** Credit 1 hour. Prerequisites: Registration in or prior credit for Zoology 251. A series of laboratory exercises designed to illustrate the course material in Zoology 251. Two hours of laboratory per week. Persons majoring in Biology may not use this course to fulfill their major requirements; however, it may be used to fulfill an elective requirement.

**301. Invertebrate Zoology.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent. A general study of the principal forms of invertebrate animals. Two hours of lecture and four hours of laboratory per week.

**302. Comparative Anatomy of the Vertebrates.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent. A comparative study of the anatomy of representative vertebrate animals. Three hours of lecture and three hours of laboratory per week.

**331. Embryology.** Credit 4 hours. Prerequisites: Zoology 301 and GBIO 200. A comparative study of the embryology of invertebrates and vertebrates. Three hours of lecture and three hours of laboratory per week.

**332. Animal Histology.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent and Junior standing or consent of the Department Head. A study of normal animal microscopic anatomy; correlations with cellular and tissue function are given. Two hours of lecture and four hours of laboratory per week.

**352. Field Zoology.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent and Junior standing or consent of the Department Head. A laboratory course designed to acquaint the student with the methods of collecting and identifying the common species of vertebrate animals found in Louisiana. One hour of lecture and six hours of laboratory per week.

**392. Animal Physiology.** Credit 4 hours. Prerequisite: GBIO 200 or consent of the Department Head. A comparative approach to study the fundamental mechanisms which underlie the basic physiological processes in animals. Laboratory will involve research experiments emphasizing hands-on instrumentation and computer usage, data analysis and scientific written reports. Three hours of lecture and three hours of laboratory per week.

**409/509. General Entomology.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent and Junior standing or consent of the Department Head. A general study of the earth's most diverse group of animals, the insects. Lecture will emphasize insect diversity, physiology, structure, and life history. Laboratory will focus on collection and identification of insects. Creation of an insect collection is a major component of the laboratory. Three hours of lecture and three hours of laboratory per week.

**428/528. Waterfowl Management.** Credit 3 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent and Junior standing or consent of the Department Head. A study of the principles, practices, and problems of waterfowl management, with an introduction to current research methods and pertinent literature. A two-hour laboratory stresses habitat evaluation with trips to waterfowl refuges. Waterfowl identification and aquatic plant identification are other laboratory objectives. Two hours of lecture and two hours of laboratory per week.

**438/538. Mammalogy.** Credit 4 hours. Prerequisites: Zoology 302 and 352 or consent of the Department Head. A study of the life history, distribution, systematics, evolution, and adaptations of mammals. Two hours of lecture and four hours of laboratory per week.

**453/553. Ecological Parasitology.** Credit 4 hours. Prerequisite: GBIO 153, BIOL 154, and Junior standing or permission of the Department Head. Survey of the major parasitic taxa, including microparasites (protists) and macroparasites (helminths). Ecological aspects of host-parasite relationships, parasite life histories, and methods of transmission. Topics in the evolutionary ecology of parasites will focus on origins and evolution of complex life cycles, host specificity, and strategies of host exploitation. Patterns and processes of parasite aggregation, population dynamics, and community structure are analyzed. Four hours of lecture per week.

**455/555. Medical Parasitology.** Credit 4 hours. Prerequisite: GBIO 153, BIOL 154, and Junior standing or permission of the Department Head. A study of human parasites of significant medical importance. Two hours of lecture and four hours of laboratory per week.

**456/556. Ichthyology.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent and Junior standing or permission of the Department Head. A study of the classification, structure, and life history of fishes, both freshwater and marine. Two hours of lecture and one four-hour laboratory per week.

**457/557. Invertebrate Ecology.** Credit 4 hours. Prerequisite: Zoology 301 or equivalent or permission of the Department Head. Field and laboratory study of ecological relationships of invertebrate animals. Observation and collection of invertebrates in terrestrial, marine, estuarine, and freshwater environments. Identification and preservation of specimens in the laboratory. Two Saturday field trips. Two hours of lecture and four hours of laboratory per week.

**458/558. Fisheries Ecology and Management.** Credit 4 hours. Prerequisites: GBIO 151, GBIO 153, and Junior standing or permission of Department Head. An evaluation of the theory and practice of fisheries ecology and management emphasizing management techniques and principles, including sampling and assessment methods, stocking, population and habitat manipulation, and regulations. The laboratory will focus on the use of sampling gears and data analysis. Two hours of lecture and four hours of lab per week.

**465/565. Animal Development.** Credit 4 hours. Prerequisite: GBIO 200. Credit for or enrollment in GBIO 312 also recommended. A study of the major patterns of animal development and the mechanisms responsible for cell differentiation during development. Three hours of lecture and three hours of lab per week.

**470/570. Ornithology.** Credit 4 hours. Prerequisites: Zoology 302 and 352 or consent of the Department Head. A study of the taxonomy, life history, distribution, evolution, and adaptations of birds. Two hours of lecture and four hours of laboratory per week.

**471/571. Comparative Endocrinology.** Credit 4 hours. Prerequisite: ZOO 392 or equivalent or permission of the Department Head. A study of the hormones regulating reproduction, growth, and homeostasis in animals, including humans. Three hours of lecture and three hours of laboratory per week.

**475/575. Animal Behavior.** Credit 4 hours. Prerequisites: GBIO 151 and GBIO 153, or permission of Department Head. This course will examine the biological basis of animal behavior, including molecular, cellular, physiological, ecological, and evolutionary aspects of survival and reproduction. Three hours of lecture and three hours of laboratory per week.

**483/583. Introduction to Paleontology.** Credit 4 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent and Junior standing or consent of the Department Head. A study of vertebrate evolution from Devonian fishes to man. The course is divided between vertebrate evolution and anthropology. Field experience will be emphasized using and teaching basic techniques and concepts. Three hours of lecture and two hours of laboratory per week.

**488/588. Cytology.** Credit 3 hours. Prerequisite: GBIO 153, BIOL 154, and Junior standing or permission of the Department Head. A study of cellular anatomy, including the major cell organelles. Three hours of lecture per week.

**499/599. Neurobiology.** Credit 4 hours. Prerequisite: GBIO 200 or permission of the Department Head. A physiological approach to the study of the nervous system. The laboratory will focus on neurophysiology and neuroanatomy. Three hours of lecture and three hours of laboratory per week.

**605. Developmental Biology.** Credit 3 hours. A study of the molecular interactions and processes which occur during the developmental phases of organelle, cell, and tissue formation. Three hours of lecture per week.

**608. Fisheries Biology.** Credit 3 hours. Prerequisite: Zoology 456/556. Research methods in fishery biology; life histories, environmental relations, and fishery management problems. One hour of lecture and four hours of laboratory per week.

**611. Advanced Invertebrate Zoology.** Credit 4 hours. Prerequisite: Zoology 301 or equivalent. A study of the phylogeny, morphology, and biology of invertebrate animals. Two hours of lecture and four hours of laboratory per week.

**630. Herpetology.** Credit 4 hours. Prerequisite: Zoology 352 or equivalent. A course dealing with the survival strategy of amphibians and reptiles. Areas of study include evolution, dispersal, and populations of these organisms with emphasis on their role in the various ecosystems. Three hours of lecture and two hours of laboratory per week.

**635. Endocrinology.** Credit 4 hours. A study of the evolution, pharmacology, physiology, and structure of endocrine glands and hormones. This will include not only the medical implications, but also the role of hormones in the survival strategy of various organisms. Three hours of lecture and four hours of laboratory per week.

**645. Environmental Physiology.** Credit 4 hrs. A study of physiology in the content of an animal's physical, chemical, and social environment. Multiple levels of organization are considered, from organism to biochemistry. Three hours of lecture and three hours of laboratory per week.

### GULF COAST RESEARCH LABORATORY

Southeastern Louisiana University is affiliated with the Gulf Coast Research Laboratory (GRCL) in Ocean Springs, Mississippi. Students apply to the Gulf Coast Research Laboratory, register at Southeastern, and go to Ocean Springs for their classes. Room and board is furnished for a fee by the Gulf Coast Research Laboratory.

**NOTE: These courses are taken as GBIO 493/593 Special Topics in Biology and require PRIOR approval of the student's advisor and the Department Head.**

#### SUMMER COURSES

COA 300	Oceanography	Credit 3 hours
COA 300L	Oceanography Lab	Credit 2 hours
COA 301	Marine Biology	Credit 3 hours
COA 301L	Marine Biology Lab	Credit 2 hours
COA 421/521	Marine Ichthyology	Credit 3 hours
COA 421L/521L	Marine Ichthyology	Credit 2 hours
COA 428/528	Marine Invertebrate Zoology	Credit 3 hours
COA 428L/528L	Marine Invertebrate Zoology Lab	Credit 2 hours
COA 442/542	Elasmobranch (Shark) Biology	Credit 3 hours
COA 442L/542L	Elasmobranch (Shark) Biology Lab	Credit 2 hours
COA 443/543	Marine Mammals	Credit 3 hours
COA 443L/543L	Marine Mammals Lab	Credit 2 hours
COA 446/546	Marine Ecology	Credit 3 hours
COA 446L/546L	Marine Ecology Lab	Credit 2 hours
COA 490/590	Special Topics	Credit 1-6 hours
COA 492/592	Special Problems	Credit 2-6 hours

### LOUISIANA UNIVERSITIES MARINE CONSORTIUM

Southeastern Louisiana University is a member of the Louisiana Universities Marine Consortium (LUMCON) and offers courses at the LUMCON DeFelice Marine Center in Cocodrie, Louisiana. Students must first apply to LUMCON. Once accepted into the program, the student then registers for credit at Southeastern Louisiana University. Room and board expenses at LUMCON and applicable laboratory fees will be assessed. Go to <http://www.lumcon.edu> for more information.

**NOTE: These courses are taken as GBIO 493/593 Special Topics in Biology and require PRIOR approval of the student's advisor and the Department Head.**

#### SPRING COURSES

Changing Coastal Oceans                      Credit 3 hours                      Spring only  
 Taught via compressed video networking. Requires one weekend field trip to LUMCON Marine Center,

#### SUMMER COURSES

Introduction to Marine Science	Credit 4 hours	Four weeks	Even years
Coral Reef Ecology	Credit 3 hours	Three weeks	Even years
Marine Field Ecology	Credit 4 hours	Four weeks	Even years
Coastal Field Geology	Credit 3 hours	Three weeks	Even years
Introduction to Marine Zoology	Credit 4 hours	Four weeks	Odd years
Marine Invertebrate Ecology	Credit 3 hours	Three weeks	Odd years
Wetland Vegetation	Credit 3 hours	Three weeks	Odd years
Marine Fish Ecology	Credit 3 hours	Three weeks	Odd years

These courses are taught by prior arrangement:

Topics in Marine Science	Credit 1-6 hours
Special Problems in Marine Science	Credit 1-6 hours

**NOTE: These courses are taken as GBIO 690 Special Topics in Biology and require PRIOR approval of the student's advisor and the Department Head**

Topics in Marine Science	Credit 1-6 hours
Special Problems in Marine Science	Credit 1-6 hours

## ENVIRONMENTAL HEALTH SCIENCES PARTNERSHIP WITH TULANE UNIVERSITY

Southeastern has established a partnership with Tulane University that allows qualified juniors or seniors at Southeastern to take graduate level courses in Environmental Health Sciences at Tulane University. The participating student may follow any of the concentrations in the Department of Biological Sciences curriculum; however, CHEM 251, Analytical Chemistry and CHEM 254, Quantitative Analysis Laboratory are required for those who enroll in the program. In addition, nine credit hours (3 of 4 courses) of Tulane Courses are required. Those courses can substitute for nine hours of upper-level Biology electives with the permission of the Department Head. Upon successful completion of this course work and graduation, the student would be eligible for acceptance into the Master of Public Health Degree Program at Tulane University. Interested students should consult with the Department Head.

Student Eligibility and Admissions: Students must apply to and be accepted by both programs at the Tulane School of Public Health and Southeastern. These students must;

1. Apply in their junior year of undergraduate study to begin courses in their senior year
2. Have a major (or 60 credits) in the sciences, math, and/or engineering with 15 of these credits in upper level (junior/senior) courses by undergraduate graduation
3. Have a grade point average of at least 3.0
4. Be recommended by their advisor with approval of the Department Head
5. Submit three letters of recommendation with one of the letters from the applicant's advisor
6. Submit a written statement of career goals
7. Take the GRE in their senior year

Graduate Courses at Tulane (students must take 3 of 4)

<b>ENHS 603</b>	Survey of Environmental Health	Credit 3 hours
<b>ENHS 660</b>	Principles of Toxicology	Credit 3 hours
<b>ENHS 651</b>	Water of Quality Management	Credit 3 hours
<b>ENHS 762</b>	Health Risk Assessment	Credit 3 hours

## HORTICULTURE (HORT)

**100. Consumer Horticulture.** Credit 3 hours. Care and culture of indoor and outdoor plants, including their use in the home landscape. One hour of lecture and four hours of laboratory per week.

**115. Basic Floral Design.** Credit 3 hours. Basic elements and design principles of contemporary flower arranging with domestic and commercial applications. Students will be responsible for cost of supplies, the amount of which will depend upon the number of creations and price level. One hour of lecture and four hours of laboratory per week. Laboratory fee: \$25.00.

**232. General Horticulture.** Credit 3 hours. Prerequisite: GBIO 151/BIOL 152. Plant propagation, plant growing, vegetable and fruit culture. Two hours of lecture and two hours of laboratory per week.

**261. Landscape Design.** Credit 3 hours. An introduction to theory and practices in design of landscape with consideration given to plant materials, site evaluation, and human needs. Two hours of lecture and two hours of laboratory per week.

**301. Introductory Soils.** Credit 4 hours. Prerequisite: Chemistry 102/104. Formation, chemical properties, physical properties, classification, and conservation of soils. Three hours of lecture and two hours of laboratory per week.

**305. Advanced Floral Design.** Credit 3 hours. Prerequisite: HORT 115 or permission of Department Head. A continuation of the basic floral design course involving more detailed floral arrangements, including centerpieces, corsages, bouquets, and sympathy tributes. One hour of lecture and four hours of laboratory. Laboratory fee \$75.00.

**315. Plant Materials I.** Credit 3 hrs. Prerequisite: HORT 232 or permission of Department Head. Characteristics, identification, and landscape uses of ornamental trees, shrubs, vines, groundcovers, and flowers adapted to Southern conditions. Two hours of lecture and two hours of laboratory per week.

**320. Plant Materials II.** Credit 4 hours. Prerequisite: HORT 232, HORT 315 or permission of the Department Head. A continuation of Plant Materials I, to include characteristics, identification, and landscape uses of ornamental trees, shrubs, vines, groundcovers and flowers adapted to Southern conditions. Three hours of lecture and two hours of laboratory per week.

**328. Plant Propagation.** Credit 3 hours. Prerequisite: Horticulture 232. A study of the asexual and sexual processes in the propagation of herbaceous and woody plants. Two hours of lecture and two hours of laboratory per week.

**361. Advanced Landscape Design.** Credit 3 hrs. Prerequisite: HORT 261. Landscape design with more detailed studies of plant design and techniques on both residential and commercial properties. Two hours of lecture and two hours of laboratory per week.



**365. Landscape Management and Practices.** Credit 3 hours. Prerequisites: HORT 232 or permission of the Department Head. The study of maintenance and management practices of landscape services, including residential, commercial and special uses landscapes. Two hours of lecture and two hours of laboratory per week.

**409. Internship.** Credit 1-3 hours. Prerequisites: Junior/Senior standing and permission of the Department Head. This course is designed to give the students practical experience working with professionals in the Horticulture field. The student is responsible for finding a sponsoring professor and a professional with whom to work. Students earn one credit for 3 hours internship per week averaged over the term, up to a maximum of 3 credits for 9 averaged hours per week. Means of evaluation is determined by the sponsoring professor and the professional. Maximum of three credits can be used for degree requirements.

**410. Fruit, Nut, and Vegetable Production.** Credit 3 hours. Principles and practices in the production and marketing of fruit, nut and vegetable crops. Three hours of lecture per week.

**412. Turf Management.** Credit 3 hours. Prerequisite: HORT 232 or permission of the Department Head. Establishment and management of turf of residential and commercial sites; includes weeds, insects, disease identification and control. Three hours of lecture per week.

**420. Greenhouse and Nursery Management.** Credit 3 hours. Prerequisite: HORT 232 or permission of the Department Head. The study of greenhouse and nursery structures, equipment, techniques and management skills. Three hours lecture per week.

**424. Arboriculture.** Credit 3 hours. Prerequisite: HORT 232 or permission of Department Head. Care of ornamental trees in the urban environment including pruning, bracing, transplanting, and fertilization. Three hours of lecture per week.

**425. Irrigation and Drainage.** Credit 3 hours. Prerequisites: HORT 232 or permission of the Department Head. The study of irrigation and drainage systems as they relate to crops and landscape installations. Three hours of lecture per week.

**426. Coastal Plant Production.** Credit 3 hours. Prerequisites: HORT 232 or permission of the Department Head. The production, propagation and care of wetland plants for the purpose of coastal wetland restoration, Two hours of lecture and two hours of lab.

**428. Organic Gardening.** Credit 3 hours. Prerequisites: HORT 232 or permission of the Department Head. Principles, production practices, maintenance, harvesting and marketing of organically and traditionally homegrown vegetables. Three hours of lecture per week.

**450. Floriculture.** Credit 3 hours. Prerequisite: Horticulture 232. Commercial production and marketing of major cut flower crops and flowering pot plants under cover and/or in the open. Two hours of lecture and two hours of laboratory per week.

**455. Interior Plants.** Credit 3 hours. Prerequisites: HORT 232 or permission of the Department Head. Basic principles, practices, maintenance and design with foliage plants and flowers in interior commercial settings. Three hours of lecture per week.

**490. Survey of the Horticulture Industry.** Credit 4 hours. Prerequisite: Permission of Department Head. A basic orientation and Introduction to the horticulture industry. Emphasis on industrial contacts, Career decisions and opportunities. Eight hours of laboratory per week.

**495. Seminar. Credit 1 hour.** Prerequisite: Senior standing or permission of the Department Head. A review of important concepts and current events in horticulture. Student must pass the Louisiana Horticulture Commission Horticulture Service examination to complete the course and graduation requirements. One hour of lecture per week.

**498. Horticulture Research Problems.** Variable Credit 1, 2, 3, or 4 hours. Prerequisite: Junior standing or permission of the Department Head. May be repeated for a maximum of four hours credit. Additional hours will not be counted towards a student's major or in the cumulative grade point average.