

BIOLOGY (BIOL)

BIOL 5102 Graduate Defense Seminar

1 Semester Credit Hour

PRESENTATION OF RESEARCH CONDUCTED FOR MS DEGREE. SHOULD BE TAKEN THE LAST SEMESTER OF RESIDENT GRADUATE STUDY. OPEN ONLY TO MS THESIS AND NON-THESIS DEGREE CANDIDATES IN BIOLOGY. STUDENTS CAN ENROLL IN ANY SEMESTER WITH THE APPROVAL OF THEIR GRADUATE ADVISORY COMMITTEE CHAIR.

BIOL 5301 CORAL REEF SYSTEMS

3 Semester Credit Hours (3 Lecture Hours)

BIOL 5304 Virology

3 Semester Credit Hours (3 Lecture Hours)

SURVEY OF BACTERIOPHAGES AND MAJOR PATHOGENIC PLANT AND ANIMAL VIRUSES INCLUDING BALTIMORE CLASSIFICATION, VIRAL REPLICATION, AND EMERGING VIRAL DISEASES. EMPHASIS ON ANALYSIS AND REVIEW OF PRIMARY LITERATURE ON VIRUSES.

Prerequisite: BIOL 2416, 2421 and CHEM 3412.

BIOL 5308 Biogeography

3 Semester Credit Hours (3 Lecture Hours)

SELECTED READING, DISCUSSION AND PROJECTS CONCERNING THE GEOGRAPHIC DISTRIBUTION OF PLANTS AND ANIMALS. OFFERED IN SPRING EVEN YEARS.

Prerequisite: BIOL 3428 and 3414.

BIOL 5309 Systematics

3 Semester Credit Hours (3 Lecture Hours)

THEORIES, METHODS, MOLECULAR AND EVOLUTIONARY BASIS OF SYSTEMATIC BIOLOGY; AND RULES AND RELATIONSHIPS OF NOMENCLATURE USED IN CLASSIFICATION.

BIOL 5310 PHYSIOLOGICAL ADAPTATIONS IN ANIMALS

3 Semester Credit Hours (3 Lecture Hours)

A STUDY OF THE PHYSIOLOGICAL ADAPTATIONS OF ANIMALS TO THEIR ENVIRONMENT, INCLUDING OSMOREGULATORY AND TEMPERATURE REGULATORY MECHANISMS.

Prerequisite: BIOL 3430.

BIOL 5311 Cellular Bases of Behavior

3 Semester Credit Hours (3 Lecture Hours)

USING VERTEBRATE AND INVERTEBRATE ANIMAL MODELS, THIS GRADUATE-LEVEL COURSE EXPLORES HOW BEHAVIORS EMERGE FROM THE ACTIVITY OF NEURAL CIRCUITS AND HOW EXPERIENCE MODULATES THESE CIRCUITS.

BIOL 5319 Biology of Marine Mammals

3 Semester Credit Hours (3 Lecture Hours)

INTRODUCTION TO MARINE MAMMALS, WITH A FOCUS ON THEIR INTERACTIONS WITH THEIR BIOTIC AND ABIOTIC ENVIRONMENT.

BIOL 5322 Molecular Genetics

3 Semester Credit Hours (3 Lecture Hours)

IN-DEPTH STUDY OF THE MOLECULAR BASIS OF GENETIC INTERACTIONS; FOCUS ON MOLECULAR MECHANISMS OF MUTATION, SUPPRESSION AND RECOMBINATION.

Prerequisite: CHEM 3412, BIOL 2416 and 3403.

BIOL 5329 Plant Adaptations

3 Semester Credit Hours (3 Lecture Hours)

EMPHASIS ON LIVING GYMNOSPERMS AND ANGIOSPERMS AND THEIR ADAPTIVE SIGNIFICANCE.

BIOL 5334 Biology and Ecology of Coral Reefs

3 Semester Credit Hours (3 Lecture Hours)

THIS COURSE WILL INTRODUCE THE BIOLOGY OF CORALS, DESCRIBE THE ABIOTIC AND BIOTIC INTERACTIONS AMONG CORAL REEF ECOSYSTEM INHABITANTS, IDENTIFY THE THREATS OF CLIMATE CHANGE, AND DISCUSS THE CONSERVATION AND MANAGEMENT OF REEFS FOR THE FUTURE. OFFERED EVERY SPRING.

BIOL 5335 Aquatic Microbiology

3 Semester Credit Hours (3 Lecture Hours)

TYPES AND DISTRIBUTION OF MICROORGANISMS IN AQUATIC ENVIRONMENTS. INTERACTIONS WITH OTHER ORGANISMS. ROLE IN NUTRIENT CYCLING, DEGRADATION OF ORGANIC SUBSTANCES, POLLUTION, WATER PURIFICATION.

Prerequisite: BIOL 2421.

Co-requisite: SMTE 0092.

BIOL 5340 GENOMICS, PROTEOMICS AND BIOINFORMATICS

3 Semester Credit Hours (3 Lecture Hours)

INTEGRATIVE BIOLOGICAL STUDY USING GENOME-WIDE APPROACHES AND BIOINFORMATICS. THE "-OMICS" TECHNOLOGIES (GENOMICS, PROTEOMICS, METABOLOMICS, ETC) WILL BE REVIEWED.

APPLICATIONS TO UNDERSTANDING BIOLOGICAL FUNCTION IN VARIOUS BIOLOGICAL DISCIPLINES WILL BE EMPHASIZED. OFFERED DURING FALL. CROSS LISTED WITH MARB 6342.

Prerequisite: BIOL 2416 and 3410 or CHEM 4301.

BIOL 5355 Public Aquarium and Animal Care Operations

3 Semester Credit Hours (3 Lecture Hours)

THIS COURSE EXAMINES THE UNIQUE REQUIREMENTS NEEDED FOR AQUARIUMS AND ZOOS TO BALANCE ANIMAL CARE AND HEALTH WITH PUBLIC DISPLAY FOR GENERAL EDUCATION AND CONSERVATION RESEARCH.

Co-requisite: SMTE 0091.

BIOL 5371 EVOLUTIONARY GENETICS

3 Semester Credit Hours (3 Lecture Hours)

An advanced introduction to evolutionary processes and their genetic basis, focusing on theoretical and experimental approaches to the study of population genetics, phylogeography, coalescence theory, evolutionary ecology, and molecular evolution.

BIOL 5392 Thesis Proposal

3 Semester Credit Hours

THESIS TRACK STUDENTS MUST COMPLETE A PROPOSAL FOR THEIR THESIS PROJECT. A PROPOSAL IS CONSIDERED COMPLETE WHEN IT IS APPROVED AND SIGNED BY ALL MEMBERS OF THE STUDENT'S GRADUATE ADVISORY COMMITTEE. OPEN ONLY TO THESIS TRACK STUDENTS IN THE MS BIOLOGY PROGRAM. QUALIFIED STUDENTS CAN ENROLL IN ANY SEMESTER WITH THE APPROVAL OF THEIR GRADUATE ADVISORY COMMITTEE CHAIR.

BIOL 5393 Thesis Research

3 Semester Credit Hours

IMPLEMENTATION OF THE THESIS PROPOSAL, AND THE PRODUCTION OF A ROUGH DRAFT OF THE THESIS SUBMITTED FOR INITIAL EDITING AND COMMENT. A COURSE SECTION WILL BE CREATED FOR THE STUDENT TO ENROLL. STUDENTS CAN ENROLL IN ANY SEMESTER WITH THE APPROVAL OF THEIR GRADUATE ADVISORY COMMITTEE CHAIR.

Prerequisite: BIOL 5392.

BIOL 5394 Thesis Submission**3 Semester Credit Hours**

THE FINAL DRAFT OF THE THESIS IS COMPLETED, APPROVED BY THE GRADUATE ADVISORY COMMITTEE, AND IS READIED FOR DISTRIBUTION. STUDENTS CAN ENROLL IN ANY SEMESTER WITH THE APPROVAL OF THEIR GRADUATE ADVISORY COMMITTEE CHAIR.

Prerequisite: (BIOL 5392 and 5393).

BIOL 5396 Directed Independent Study**1-3 Semester Credit Hours (1-3 Lecture Hours)**

STUDY IN AREAS OF CURRENT INTEREST. CREDIT IS NOT GIVEN FOR RESEARCH ON THE THESIS PROJECT. A TOTAL OF SIX SEMESTER HOURS OF DIRECTED INDEPENDENT STUDY MAY BE COUNTED TOWARD THE MS DEGREE.

BIOL 5397 Directed Research**3 Semester Credit Hours**

FOR STUDENTS IN THE MS BIOLOGY PROFESSIONAL TRACK. FIELD, LABORATORY, AND/OR LIBRARY RESEARCH THAT RESULTS IN THE PRODUCTION OF THE PROFESSIONAL PAPER, ITS APPROVAL BY THE GRADUATE ADVISORY COMMITTEE, AND ITS FINAL SUBMISSION. STUDENTS CAN ENROLL IN ANY SEMESTER WITH THE APPROVAL OF THEIR GRADUATE ADVISORY COMMITTEE CHAIR. THIS COURSE MUST BE SUCCESSFULLY COMPLETED FOR THE PROFESSIONAL TRACK STUDENT TO COMPLETE THE MS DEGREE.

BIOL 5406 Immunology**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

AN IN-DEPTH STUDY OF IMMUNOLOGY. EMPHASIZES FUNCTION AND INTERACTION OF SPECIFIC CELLS, CYTOKINES, LYMPHOKINES, ANTIBODIES AND MOLECULES THAT ARE THE ESSENTIAL COMPONENTS OF THE IMMUNE SYSTEM. THE COURSE INCLUDES UP-TO-DATE COVERAGE OF BOTH INNATE AND ADAPTIVE IMMUNITY, AND THE IMMUNE SYSTEM IN HEALTH AND DISEASE.

Prerequisite: BIOL 2421.

Co-requisite: SMTE 0092.

BIOL 5408 Microbial Ecology**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

RELATIONSHIPS BETWEEN MICROORGANISMS AND THEIR BIOTIC AND ABIOTIC ENVIRONMENTS. ROLE OF MICROORGANISMS IN BIOGEOCHEMICAL CYCLING. METHODOLOGY IN MICROBIAL ECOLOGY. BIOTECHNOLOGICAL ASPECTS.

Co-requisite: SMTE 0092.

BIOL 5410 Mammalogy**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

THE COURSE IS DESIGNED FOR GRADUATE STUDENTS IN BIOLOGY WANTING TO ACQUIRE A MORE DETAILED WORKING KNOWLEDGE AND APPRECIATION OF MAMMALIAN DIVERSITY IN STRUCTURE, FUNCTION, ETHOLOGY, AND ECOLOGY. KNOWLEDGE AND SKILLS ACQUIRED IN THIS COURSE WILL BE USEFUL TO FIELD AND LABORATORY STUDIES IN ECOLOGY, EVOLUTION, ANIMAL BEHAVIOR, BIOGEOGRAPHY, WILDLIFE MANAGEMENT, AND RELATED DISCIPLINES.

Co-requisite: SMTE 0091.

BIOL 5411 Ethology**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

ADAPTIVE ASPECTS OF ANIMAL BEHAVIOR.

Co-requisite: SMTE 0091.

BIOL 5412 ECOLOGY OF FRESH WATERS**4 Semester Credit Hours (4 Lecture Hours)**

Ecological relationships and productivity of freshwater communities, including rivers, lakes and wetlands. Focus is on interactions of the physical, chemical and biotic environment and influence of human activities on systems.

Co-requisite: SMTE 0091.

BIOL 5414 Growth and Development**4 Semester Credit Hours (4 Lecture Hours)**

SPECIAL TOPICS INVOLVING GROWTH AND DEVELOPMENT IN PLANTS AND ANIMALS.

Co-requisite: SMTE 0092.

BIOL 5415 Biology of Estuarine Organisms**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

SYSTEMATICS, DISTRIBUTION, AND ECOLOGY OF ESTUARINE MACROFAUNA AND MACROFLORA. WEEKEND FIELD TRIPS AND INDIVIDUAL STUDY REQUIRED.

Prerequisite: BIOL 3413.

Co-requisite: SMTE 0091.

BIOL 5417 Field Biology**4 Semester Credit Hours (1 Lecture Hour, 6 Lab Hours)**

FIELD BIOLOGY IS A HANDS-ON COURSE DESIGNED TO TEACH STUDENTS KEY CONCEPTS BY IMMERSING THEM IN NATURE. TOPICS INCLUDE ADAPTATIONS OF PLANTS AND ANIMALS IN DIFFERENT HABITATS, FOOD WEB INTERACTIONS, AND HOW BIOTIC AND ABIOTIC FORCES INTERACT TO STRUCTURE NATURAL COMMUNITIES INCLUDING SPATIAL AND TEMPORAL VARIATION IN COMMUNITIES.

Prerequisite: BIOL 3428.

Co-requisite: SMTE 0091.

BIOL 5420 Application of Molecular Techniques**4 Semester Credit Hours (4 Lecture Hours)**

APPLICATION OF DNA-RNA TECHNOLOGY TO SELECTED SCIENTIFIC PROBLEMS. EMPHASIS ON CURRENT RESEARCH TECHNIQUES.

Prerequisite: BIOL 3403 and CHEM 3411.

Co-requisite: SMTE 0092.

BIOL 5422 Plant Taxonomy**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

EXPERIMENTAL AND ANALYTICAL APPROACHES TO PLANT VARIATION AND EVOLUTION, BREEDING SYSTEMS, CYTO- AND MOLECULAR GENETICS, HYBRIDIZATION AND PHYLOGENY. THE COURSE WILL PRESENT A FOUNDATIONAL APPROACH TO THE METHODS, RESEARCH AND TERMINOLOGY OF PLANT SYSTEMATICS AND SUMMARIZE INFORMATION ON THE MOST RECENT KNOWLEDGE OF EVOLUTIONARY RELATIONSHIPS AS WELL AS PRACTICAL INFORMATION VITAL TO FIELD WORK.

Co-requisite: SMTE 0091.

BIOL 5425 Ornithology**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

THE COURSE IS DESIGNED FOR GRADUATE STUDENTS IN BIOLOGY WANTING TO ACQUIRE A MORE DETAILED WORKING KNOWLEDGE AND APPRECIATION OF AVIAN DIVERSITY IN STRUCTURE, FUNCTION, ETHOLOGY, AND ECOLOGY. KNOWLEDGE AND SKILLS ACQUIRED IN THIS COURSE WILL BE USEFUL TO FIELD AND LABORATORY STUDIES IN ECOLOGY, EVOLUTION, ANIMAL BEHAVIOR, BIOGEOGRAPHY, WILDLIFE MANAGEMENT, AND RELATED DISCIPLINES.

Co-requisite: SMTE 0091.

BIOL 5426 AVIAN BIOLOGY**4 Semester Credit Hours (4 Lecture Hours)**

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Co-requisite: SMTE 0091.**BIOL 5427 COASTAL ECOLOGY OF TEXAS****4 Semester Credit Hours (4 Lecture Hours)**

Study of the ecology and environmental issues of the Texas coast.

Includes field trips along the entire Texas coastline.

Co-requisite: SMTE 0091.**BIOL 5428 FISHERIES BIOLOGY****4 Semester Credit Hours (4 Lecture Hours)**

Advanced study of theory and techniques in fisheries science including behavior of fisheries populations and applications to resource management with emphasis in tidal-influenced waters. Includes readings in the current literature and a research project. The laboratory will emphasize practical sampling design and data interpretation.

BIOL 5429 Marine Botany**4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

MARINE PLANTS ARE A DIVERSE GROUP THAT INCLUDES UNICELLULAR ALGAE, SEAWEEDS, SEAGRASSES, SALT MARSHES, AND MANGROVE FORESTS. THE GOAL IS TO PRESENT TAXONOMIC, PHYSIOLOGICAL, CHEMICAL, AND ECOLOGICAL ASPECTS OF MARINE PLANTS, THEIR ADAPTATIONS, AND HOW ABIOTIC AND BIOTIC FACTORS INTERACT IN THEIR COMMUNITIES. THE USE OF RECENT JOURNALS AND ORIGINAL SCIENTIFIC RESEARCH WILL ALLOW THE STUDENT TO EVALUATE ANTHROPOGENIC EFFECTS TO THESE COMMUNITIES AND DEVELOP METHODS OF RESTORATION AND MANAGEMENT.

Co-requisite: SMTE 0091.**BIOL 5430 Marine Plankton****4 Semester Credit Hours (4 Lecture Hours)**

INVESTIGATION OF THE SYSTEMATICS, DISTRIBUTION, AND ECOLOGY OF MARINE PLANKTON. CROSS LISTED WITH MARB 6430.

Co-requisite: SMTE 0091.**BIOL 5431 Phycology****4 Semester Credit Hours (4 Lecture Hours)**

STUDY OF THE MAJOR GROUPS OF FRESHWATER AND MARINE ALGAE; MORPHOLOGY, ECOLOGY, SYSTEMATICS, LIFE CYCLES, AND PHYSIOLOGY. LABORATORIES EMPHASIZE COLLECTION, IDENTIFICATION, AND CULTURING TECHNIQUES.

Co-requisite: SMTE 0092.**BIOL 5432 Ichthyology****4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

THE STUDY OF FISH ENCOMPASSING SPECIES DIVERSITY, NATURAL HISTORY, AND EVOLUTIONARY AND ECOLOGICAL RELATIONSHIPS OF FISHES. THIS COURSE WILL CONSIST OF FOUR MAJOR PARTS: (1) EVOLUTION, (2) SYSTEMATICS, (3) BIOLOGY, AND (4) ECOLOGY OF FISH. LABORATORY IDENTIFICATION OF MARINE AND FRESHWATER FISHES FROM THE UNIVERSITY ARCHIVES AND COLLECTED DURING FIELD EXCURSIONS.

Co-requisite: SMTE 0091.**BIOL 5435 Biological Microtechniques****4 Semester Credit Hours (2 Lecture Hours, 4 Lab Hours)**

THE THEORY AND PRACTICE OF USING HISTOCHEMICAL AND MICROSCOPIC TECHNIQUES TO PREPARE TISSUES AND SMALL SPECIMENS FOR RESEARCH ANALYSIS.

Prerequisite: CHEM 3411.**Co-requisite:** SMTE 0092.**BIOL 5436 Marine Ecological Processes****4 Semester Credit Hours (4 Lecture Hours)**

ADVANCED STUDIES IN STRUCTURE AND HABITATS OF MARINE ENVIRONMENTS. EMPHASIS ON FACTORS INFLUENCING DISTRIBUTION OF MARINE ORGANISMS, INCLUDING FIELD TRIPS TO AREAS ALONG THE TEXAS COAST.

Prerequisite: BIOL 3428.**Co-requisite:** SMTE 0091.**BIOL 5437 ECOLOGY OF MARINE PLANTS****4 Semester Credit Hours (4 Lecture Hours)****Co-requisite:** SMTE 0091.**BIOL 5442 Herpetology****4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

A GLOBAL PERSPECTIVE AND CURRENT RESEARCH TOPICS ON THE BIOLOGY OF AMPHIBIANS AND REPTILES. OFFERED IN SPRING ODD YEARS.

Co-requisite: SMTE 0091.**BIOL 5446 Tropical Ecology and Conservation****4 Semester Credit Hours (4 Lecture Hours, 3 Lab Hours)**

THIS IS AN OVERVIEW COURSE IN MAJOR ECOSYSTEMS IN BOTH THE NEW AND OLD WORLD TROPICS, THE ECOLOGICAL PRINCIPLES AT WORK IN THESE SYSTEMS, AND THE CURRENT THREATS AND CONSERVATION APPROACHES BEING USED. IT WILL BE A HYBRID COURSE INCLUDING LECTURES AND JOURNAL READINGS/DISCUSSION (SEMINAR-STYLE). OFFERED FALL ODD YEARS.

Prerequisite: BIOL 3428.**BIOL 5452 Ecology and Evolution of Fishes****4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)**

THIS COURSE COVERS ASPECTS OF FISH ECOLOGY FROM INDIVIDUAL, POPULATION, COMMUNITY, AND ECOSYSTEM LEVELS. WE DISCUSS THE ROLE OF THE ENVIRONMENT ON FISH PHYSIOLOGY AND BEHAVIOR, FOOD-WEB DYNAMICS, COMMUNITY ASSEMBLY AND DIVERSITY, ECOSYSTEM INTERACTIONS, AND ANTHROPOGENIC IMPACTS ON FISHES WITH A FOCUS ON CONSERVATION.

Co-requisite: SMTE 0091.**BIOL 5590 Special Topics****5 Semester Credit Hours (5 Lecture Hours)**

AN ADVANCED STUDY OF A BIOLOGICAL TOPIC. MAY BE REPEATED WITH FULL CREDIT IN ANOTHER AREA OF BIOLOGY. TOPICS VARY BY SEMESTER.

BIOL 5609 Field and Sampling Techniques**3-6 Semester Credit Hours (3 Lecture Hours, 6 Lab Hours)**

EXPERIENCE IN FIELD STUDIES, ORGANIZING FIELD NOTES, COLLECTING AND METHODS OF PRESERVING ORGANISMS FOR TEACHING AND MUSEUM PURPOSES. THE COURSE INCLUDES FIELD ECOLOGICAL SAMPLING METHODS, ENVIRONMENTAL DATA COLLECTION, SAFETY, LOGISTICS, AND PROPER SCIENTIFIC EQUIPMENT OPERATION.

Co-requisite: SMTE 0091.**BIOL 5940 Project Research****1-9 Semester Credit Hours (1-9 Lecture Hours)**

RESEARCH RELATED TO THE MS PROJECT. OPEN ONLY TO DEGREE CANDIDATES IN BIOLOGY WITH CONSENT OF THE GRADUATE ADVISOR. THIS COURSE MAY BE REPEATED AS NEEDED BUT A MAXIMUM OF 4 HOURS CAN BE APPLIED TO THE MS DEGREE IN BIOLOGY. COURSE IS TAKEN AS CREDIT/NON-CREDIT. STUDENTS CAN ENROLL IN ANY SEMESTER WITH THE APPROVAL OF THEIR GRADUATE ADVISORY COMMITTEE CHAIR.

BIOL 6371 EVOLUTIONARY GENETICS

3 Semester Credit Hours (3 Lecture Hours)

BIOL 6446 TROPICAL ECOLOGY&CONSERVATION

4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)

TROPICAL ECOLOGY AND CONSERVATION Ecological processes and conservation issues in the tropics. Laboratory focuses on field techniques used to study tropical forest ecology. Principals of Ecology (BIOL 3428) or equivalent, or permission of instructor. SMTE 0091 is a co-requisite for this course. Documented completion of this safety training is required early in the semester for continued participation in this course.

Co-requisite: SMTE 0091.