<table>
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<th>Course Number and Title</th>
<th>Course Description and Prerequisites</th>
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<tr>
<td><strong>INTRODUCTORY COURSES</strong></td>
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</tbody>
</table>
| BIO 311C: Introductory Biology I | Introduction to biological energy transformation, cell structure and physiology, and gene expression.  
Prerequisites: Credit or registration for CH 301 or 301H. |
| BIO 311D: Introductory Biology II | Introduction to mechanisms of inheritance, evolution, physiology, and species interactions. Basic principles of Mendelism, molecular genetics, structure and function of genes and chromosomes, populations and evolution.  
Prerequisites: BIO 311C with a grade of at least C-. |
| BIO 325: Genetics | Basic principles of Mendelism, molecular genetics, structure and function of genes and chromosomes, populations and evolution.  
Prerequisites: BIO 311C and 311D with a grade of at least C- in each. |
| CH 301: Principles of Chemistry I | Three lecture hours a week for one semester. Some sections also require one enrichment/discussion hour a week; these are identified in the Course.  
Prerequisite: Credit with a grade of at least C- or registration for one of the following: Mathematics 305G, 408C, 408D, 408K, 408L, 408M, 408N, 408S, Statistics and Scientific Computation 302; and an appropriate score on the ALEKS chemistry placement examination. |
| CH 302: Principles of Chemistry II | Development and application of concepts, theories, and laws underlying chemistry.  
Prerequisites: Credit with a grade of at least C- in Chem 301 or 301H; and credit with a grade of at least C- or registration for one of the following: M408C, 408D, 408K, 408L, 408M, 408N, 408S, SSC 302 |
| CH 204: Introduction to Chemical Practices | Introduction to the techniques of modern experimental chemistry. Designed to provide basic laboratory and analytical skills. May include organic, analytical, and physical chemistry, as well as materials science.  
Prerequisites: Credit or registration for CH 302. |
| **CALCULUS COURSE – CHOOSE ONE OF THE FOLLOWING SEQUENCES** |                                      |
| M408C: Differential and Integral Calculus | Introduction to the theory and applications of differential and integral calculus of functions of one variable; topics include limits, continuity, differentiation, the mean value theorem and its applications, integration, the fundamental theorem of calculus, and transcendental functions.  
Prerequisites: A score of at least 80 on the ALEKS placement examination. |
| AND |                                      |
| M408D: Sequences, Series, and Multivariable Calculus | Introduction to the theory and applications of sequences and infinite series, including those involving functions of one variable, and to the theory and applications of differential and integral calculus of functions of several variables; topics include parametric equations, sequences, infinite series, power series, vectors, vector calculus, functions of several variables, partial derivatives, gradients, and multiple integrals.  
Prerequisites: M 408C, 408L, or 408S with a grade of at least C-. |
| OR |                                      |
| M 408N: Differential Calculus for Science | Introduction to the theory of differential calculus of functions of one variable, and its application to the natural sciences. Subjects may include limits and differentiation, with applications to rates of change, extremes, graphing, and |
exp

exponential growth and decay.

Prerequisites: A score of at least 70 on the ALEKS placement examination.

AND

M 408S: Integral Calculus for Science

Restricted to students in the College of Natural Sciences. Introduction to the theory of integral calculus of functions of one variable, and its applications to the natural sciences. Subjects may include integration and its application to area and volume, and transcendental functions, sequences, and series and their application to numerical methods.

Prerequisites: M 408C, 408K, or 408N with a grade of at least C-.

INTRODUCTORY BIO LAB – CHOOSE ONE

BIO 206L: Intro Lab Experiments in Biology

The organizing principles of biology (such as molecular and cellular functions, reproduction, development, homeostatic mechanisms, and organismal physiology and behavior) are used within a comparative and evolutionary framework to train students in modern laboratory techniques, bioinformatics, experimental design, and interpretation of results.

Prerequisites: Credit or registration for Biology 311C or 311D (or credit for Biology 211 or 214).

BIO 208L – W: Field Biology

Field projects, laboratory exercises, field trips, and computer simulation exercises to acquaint students with the principles and applications of ecology and some of the experimental and descriptive methods of ecological investigations.

Prerequisites: Credit or registration for BIO 311D. Taught in the spring and fall only.

ORGANIC CHEMISTRY

CH 320M: Organic Chemistry I

The development of organic chemical structure, nomenclature, and reactivity.

Prerequisites: CH 302 with a grade of at least C-, and credit or registration for CH 204 or 317.

CH 320N: Organic Chemistry II

The development of organic chemical reactivity, with a focus on carbohydrates, proteins, and nucleic acids.

Prerequisites: CH 204 or 317 and CH 310 M with a grade of at least C- in each, and credit or registration for CH 210C.

CH 220C: Organic Chemistry Laboratory

Prerequisites: CH 204 or 317 and CH 310 M with a grade of at least C- in each, and credit or registration for CH 310N

PHYSICS SEQUENCE – CHOOSE ONE 8 HOUR SEQUENCE

PHY 302 & 102M; and 302L & 102N: General Physics--Technical Course

Noncalculus technical courses in physics: Mechanics, Heat, and Sound. Electric

Prerequisites: M 305G and credit or registration for PHY 102M; PHY 302K and 102M and credit or registration for PHY 102N.

PHY 317K & 117M; and 317L & 112N: General Physics I and II

Introductory courses designed and recommended primarily for premedical students and others in the biomedical sciences whose professional or pre-professional training includes an introductory course in calculus. Mechanics, heat, and sound, with biomedical applications. Electricity and magnetism, light, atomic and molecular physics, nuclear physics, and their biomedical applications.

Prerequisites: M 408C, or 408K and coenrollment in 408L or M408N and coenrollment in M408S and credit or registration for PHY 117M; PHY 317K and 117M and credit or registration for PHY 117N.
Human Biology Course Descriptions 12-14

PHY 301 & 101L; and 316 & 112L: Mechanics; Electricity and Magnetism

Prerequisites: M 408C, or 408K and coenrollment in 408L or M 408N and coenrollment in M 408S and credit or registration for PHY 101L; PHY 301 and 101L, M 408D, or 408L and coenrollment in 408M and credit or registration for PHY 116L.

PHY 303K and 103M; and 303L & 103N: Engineering Physics I and II

Prerequisites: M 408C, or 408K and coenrollment in 408L or M 408N and coenrollment in M 408S and credit or registration for PHY 103M; PHY 303K and 103M, M 408D, or 408L and coenrollment in 408M and credit or registration in PHY 103N.

REQUIRED UPPER-DIVISION BIOLOGY COURSES

SSC 328M: Biostatistics

Introduction to methods of statistical analysis of biological data. 
Prerequisites: Four hours of coursework in BIO and either M 408D or 408L.

BIO 346: Human Biology

Introduction to human evolution, genetics, sexuality, senescence, and population growth.
Prerequisites: BIO 325 or 325H with a grade of at least C-.

BIO 137: Seminar in Human Biology

Prerequisites: BIO 137 or BIO 325 or M 325H with a grade of at least C-

18 HOURS OF COURSEWORK FROM THE FOLLOWING:
CELLULAR AND MOLECULAR BIOLOGY - CHOOSE AT LEAST 3 HOURS

BIO 320: Cell Biology

Principles of eukaryotic cell structure and function; macromolecules, energetics, membranes, organelles, cytoskeleton, gene expression, signaling, division, differentiation, motility, and experimental methodologies.
Prerequisites: BIO 325 or 325H with a grade of at least C-.

BIO 326R: General Microbiology

Overview of the major areas of micro-biological study, including cell structure and function, genetics, host-microbe interactions, physiology, ecology, diversity, and virology.
Prerequisites: BIO 325 or 325H and CH 302 or 302H with grades of at least C-.

BIO 344: Molecular Biology

Molecular basis of cellular processes: gene structure and function; DNA replication; RNA and protein synthesis; viruses; molecular aspects of immunology and cancer, and recombinant DNA.
Prerequisites: BIO 325 or 325H with a grade of at least C-.

ADDITIONAL CELLULAR AND MOLECULAR BIOLOGY - CHOOSE AT LEAST 3 HOURS

BIO 320: Cell Biology

Principles of eukaryotic cell structure and function; macromolecules, energetics, membranes, organelles, cytoskeleton, gene expression, signaling, division, differentiation, motility, and experimental methodologies.
Prerequisites: BIO 325 or 325H with a grade of at least C-.

BIO 320L: Cell Biology Laboratory

Explores the complex structures and functions of cells through direct observation and experimentation. Subjects may include regulation of gene transcription and translation, protein sorting, organelles and membrane trafficking, cytoskeletal dynamics, and cell division. Students use a combination of modern molecular biology, biochemistry, and microscopy techniques, with a strong emphasis placed on hypothesis-driven approaches, proper experimental design, and clear scientific writing and presentation.
Prerequisites: BIO 325 or 325H with a grade of at least C- and credit with a grade of at least C- or registration for BIO 320.
BIO 323L – W: Laboratory Studies in Cell Biology
Research exercises involving light/electron microscopy, image processing, auto-radiography, chromatography, fractionation, flow cytometry, spectroscopy, diffraction, antibody labeling, cell growth, and kinetics. 
Prerequisites: BIO 325 or 325H with a grade of at least C-, and credit or registration for BIO 320.

BIO 325L-W: Laboratory Experience in Genetics
Experimentation and direct observation in fundamental aspects of transmission genetics.
Prerequisites: BIO 325 or 325H with a grade of at least C-.

BIO 325T: Human Genetics
Genomics, cancer genetics, identification and analysis of human disease genes, and monogenic and multifactorial traits in humans.
Prerequisites: BIO 325 or 325H with a grade of at least C-.

BIO 326R: General Microbiology
Overview of the major areas of micro-biological study, including cell structure and function, genetics, host-microbe interactions, physiology, ecology, diversity, and virology.
Prerequisites: BIO 325 or 325H and CH 302 or 302H with grades of at least C-.

BIO 344: Molecular Biology
Molecular basis of cellular processes: gene structure and function; DNA replication; RNA and protein synthesis; viruses; molecular aspects of immunology and cancer, and recombinant DNA.
Prerequisites: BIO 325 or 325H with a grade of at least C-.

ANATOMY – CHOOSE AT LEAST 3 HOURS

ANT 432L: Primate Anatomy
Comparative and functional anatomy of primates, including humans; emphasis on adaptations and evolution of the various taxa.
Prerequisites: ANT 301 or consent of instructor.

BIO 446L: Human Microscopic and Gross Anatomy
Designed for students preparing for biomedical research and the health professions. Focuses on microscopic and gross anatomy of human tissues and organs, with an emphasis on structure function relationships. Subjects include the effects of disease and aging in addition to normal human anatomy.
Prerequisites: BIO 311C; BIO 325 or 325H C-; CH 301; and one of the following courses: M 408C 408K, 408N, 408R, SSC 302, with a grade of at least C- in each.

BIO 478L: Comparative Vertebrate Anatomy
Study of vertebrate morphology from developmental anatomy to the function, biomechanics, and phylogenetic relationships of living and fossil taxa.
Prerequisites: BIO 325 or 325H with a grade of at least C-.

KIN 324K: Applied Human Anatomy
Combines the study of systematic and regional human anatomy. Includes skeletal system, attachments and actions of muscles, principal blood vessels and nerves; emphasis on the mechanics of support and motion; laboratory studies on human cadaver material.
Prerequisites: None

Physiology – choose at least 3 hours

BIO 361T: Comparative Animal Physiology
Physiology of organ systems in animal phyla, with special emphasis on physiological adaptations of organisms to their environment.
Prerequisites: BIO 325 or 325H with a grade of at least C-.

BIO 365R: Vertebrate Physiology
Introduction to the nervous system and other excitable tissues. Subjects may
include membrane potentials, ion channels, synaptic transmission, learning and memory, skeletal and cardiac muscle, and how systems of neurons lead to sensation and motor output. Human diseases are used to illustrate perturbation of normal function.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

### BIO 365S: Vertebrate Systems Physiology
Overview of body fluids, the cardiovascular system, respiration, digestion, metabolism, and endocrinology.

**Prerequisites:** BIO 311C; 325 or 325H; Chem 301 and one of the following: M408C, 408K, 408N, 408R, SSC 302 with a grade of at least C- in each.

### BEHAVIOR AND PSYCHOLOGY – CHOOSE AT LEAST 3 HOURS

#### BIO 359K: Principles of Animal Behavior*
An introduction to the study of animal behavior: descriptive analysis of behavior; physiological basis of behavior; development of behavior; adaptive significance and evolution of behavior; communication and social behavior.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

#### BIO 359R: Animal Sexuality
The biology of sexuality, including genetics, morphology, physiology, and psychology of sex.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

#### PSY 332: Behavioral Neuroscience
Neuroscientific study of behavioral functions, including: fundamental structure and function of human nervous system; sensory systems and perception; motor systems and behavior; motivation and learning; brain disorders and maladaptive behavior.

**Prerequisites:** PSY 301 with a grade of at least C- and BIO 318M or an equivalent statistics crs. PSY 308 or 6 hrs BIO crs strongly recommended.

### ECOLOGY AND EVOLUTION – CHOOSE AT LEAST 3 HOURS

#### BIO 357: Evolutionary Ecology*
Principles of modern ecology, particularly as they relate to natural selection and evolutionary theory.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

#### BIO 364: Microbial Ecology
The ability of microbes to adapt to and change their environment.

**Prerequisites:** BIO 325 or 325H and BIO 126L and 326R with a grade of at least C- in each.

#### BIO 370: Evolution*
Introduction to modern evolutionary biology, focusing on the evolution of molecular, developmental, morphological, and behavioral traits. Genetic and ecological bases of evolutionary changes within populations and of evolutionary divergence in animals and plants.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

#### BIO 373: Ecology*
An introduction to ecology, the study of relationships among organisms and between organisms and their environment; adaptations, population, communities, and ecosystems. Includes both plants and animals and both terrestrial and aquatic ecosystems.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

### 15 HOURS FROM ONE OF THE FOLLOWING CONCENTRATIONS – 9 HOURS OF UPPER-DIVISION IS REQUIRED

#### 1. CELLULAR, MOLECULAR, AND DEVELOPMENTAL BIOLOGY:

##### CH 369: Fundamentals of Biochemistry (Required)
A survey course covering the basics of protein structure and function, carbon and nitrogen metabolism, and molecular biology of macromolecules.

**Prerequisites:** CH 320M or 318M with a grade of at least C-.

##### BIO 320L: Cell Biology Laboratory
Explores the complex structures and functions of cells through direct...
observation and experimentation. Subjects may include regulation of gene transcription and translation, protein sorting, organelles and membrane trafficking, cytoskeletal dynamics, and cell division. Students use a combination of modern molecular biology, biochemistry, and microscopy techniques, with a strong emphasis placed on hypothesis-driven approaches, proper experimental design, and clear scientific writing and presentation.

**Prerequisites:** BIO 325 or 325H with a grade of at least C- and credit with a grade of at least C- or registration for BIO 320.

**BIO 323L – W: Laboratory Studies in Cell Biology**

Research exercises involving light/electron microscopy, image processing, autoradiography, chromatography, fractionation, flow cytometry, spectroscopy, diffraction, antibody labeling, cell growth, and kinetics.

**Prerequisites:** BIO 325 or 325H with a grade of at least C- or registration for BIO 320.

**BIO 325L-W: Laboratory Experience in Genetics**

Experimentation and direct observation in fundamental aspects of transmission genetics.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

**BIO 325T: Human Genetics**

Genomics, cancer genetics, identification and analysis of human disease genes, and monogenic and multifactorial traits in humans.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

**BIO 326R: General Microbiology**

Overview of the major areas of micro-biological study, including cell structure and function, genetics, host-microbe interactions, physiology, ecology, diversity, and virology.

**Prerequisites:** BIO 325 or 325H and CH 302 or 302H with grades of at least C-.

**BIO 226L: General Microbiology Laboratory**

Introduction to microbiology laboratory techniques and experimental demonstration of principles of microbiology.

**Prerequisites:** Credit with a grade of at least C- or registration for BIO 326M or 326R.

**BIO 328D: Discovery Laboratory in Plant Biology**

Learning methods of experimental design, data gathering, data interpretation, and data presentation, including original experiments relating to questions of current interest in plant physiology.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

**BIO 330: Animal Virology**

Mechanisms by which viruses replicate and kill or transform cells.

**Prerequisites:** BIO 325 or 325H and BIO 126L and 326R with grades of at least C- in each.

**Bio 230L: Virology Laboratory**

Basic experimental techniques applied to selected bacteriophages and animal viruses.

**Prerequisites:** BIO 325 or 325H, and 126L with a grade of at least C- in each, and credit with a grade of at least C- or registration for BIO 330 or 333.

**BIO 331L – Laboratory Studies in Molecular Biology**

The methods and principles of molecular biology in a research laboratory context. Students conduct a research project directed by a faculty member.

**Prerequisites:** BIO 205L, 206L, 208L, or 126L; BIO 325 or 325H with a grade of at least C-.

**BIO 332: Yeast Cell Biology**

Yeast is used as a model to teach some of the more actively researched areas of cell biology, such as chromosome structure, mating type, cell-cell interaction, DNA replication, mitosis, cytoskeletal motors, cell polarity, signal
transduction, cell cycle, checkpoints, secretion, protein modification, yeast genetics, and yeast technology.

**Prerequisites:** BIO 325 or 325H and BIO 126L and 326R with a grade of at least C- in each.

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**BIO 339M: Bacterial Behavior and Signaling Mechanisms**

Advanced studies in how bacteria perceive their environment and communicate with each other. Subjects may include chemotaxis and motility, morphogenesis and development, and secretion and virulence. Taught entirely through reading and discussion of original articles.

**Prerequisites:** BIO 325 or 325H, and BIO 126L and 326R with a grade of at least C- in each.

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**BIO 345: Cell Physiology**

An integrated approach to basic processes in physiology: metabolism, transport, energetics, molecular and cellular control mechanisms.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-, and CH 310M.

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**BIO 349: Developmental Biology**

Principles of animal development, with emphasis on developmental mechanisms.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

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**BIO 349L: Experiments in Animal Developmental Biology**

Methods and principles of developmental biology in a laboratory context, with emphasis on animal embryology using molecular techniques and microscopy.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-, and credit with a grade of at least C- or registration for BIO 349.

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**BIO 365N: Development and Plasticity of the Nervous System**

An introduction to the principles by which the neural tube (brain and spinal cord) develops during embryogenesis, including regionalization of the brain into forebrain, midbrain, hindbrain, and spinal cord. Particular emphasis will be given to the mechanisms that govern how neurons acquire their identity and form neuronal circuits and synapses. Developmental and congenital diseases and possible therapies, including stem cell based therapy or gene therapy.

**Prerequisites:** BIO 349 and 365R or 371M with a grade of at least C- in each.

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### 2. GENETICS AND BIOTECHNOLOGY:

**CH 369: Fundamentals of Biochemistry (Required)**

A survey course covering the basics of protein structure and function, carbon and nitrogen metabolism, and molecular biology of macromolecules.

**Prerequisites:** CH 320M or 318M with a grade of at least C-.

---

**BIO 325L-W: Laboratory Experience in Genetics**

Experimentation and direct observation in fundamental aspects of transmission genetics.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

---

**BIO 325T: Human Genetics**

Genomics, cancer genetics, identification and analysis of human disease genes, and monogenic and multifactorial traits in humans.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

---

**BIO 326R: General Microbiology**

Overview of the major areas of micro-biological study, including cell structure and function, genetics, host-microbe interactions, physiology, ecology, diversity, and virology.

**Prerequisites:** BIO 325 or 325H and CH 302 or 302H with grades of at least C-.

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**BIO 226L: General Microbiology Laboratory**

Introduction to microbiology laboratory techniques and experimental demonstration of principles of microbiology.
**Prerequisites:** Credit with a grade of at least C- or registration for BIO 326M or 326R.

BIO 355:

BIO 337: Topic: Emerging Infectious Disease

BIO 377: Topic: Epigenetics

BIO 377: Topic: Genomics

BIO 347: Biology and Genetics of Immune Disorders (Fall)

Immune disorders in mammals, including humans, used as models for examining basic immunological and immunogenetic principles; emphasis on immune disorders of vertebrates.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

BIO 366: Microbial Genetics

Molecular biology of nucleic acids; biosynthesis of macromolecules, transfer of genetic material from cell to cell, recombination, mutagenesis, and regulatory mechanisms.

**Prerequisites:** BIO 325 or 325H and BIO 126L and 326R with a grade of at least C- in each.

BIO 366R: Molecular Genetics

Techniques used for studying molecular biology and transgenic organisms. Includes advanced genetics and the molecular genetics used in clinical applications.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

PHL 325M: Medicine, Ethics, and Society

Moral, legal, religious, and political implications of developments in medicine; topics include abortion, euthanasia, sterilization, psychosurgery, genetic engineering; concepts of health, cure, insanity, and death.

**Prerequisites:** None

### 3. PATHOGENESIS AND IMMUNITY

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<td>CH 320M or 318M with a grade of at least C-</td>
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<td>BIO 326R: General Microbiology</td>
<td>Overview of the major areas of micro-biological study, including cell structure and function, genetics, host-microbe interactions, physiology, ecology, diversity, and virology.</td>
<td>BIO 325 or 325H and CH 302 or 302H with grades of at least C-</td>
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<tr>
<td>BIO 226L: General Microbiology Laboratory</td>
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<td>Credit with a grade of at least C- or registration for BIO 326M or 326R.</td>
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<td>BIO 330: Animal Virology</td>
<td>Mechanisms by which viruses replicate and kill or transform cells.</td>
<td>BIO 325 or 325H and BIO 326L and 326R with grades of at least C- in each.</td>
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<td>Bio 230L: Virology Laboratory</td>
<td>Basic experimental techniques applied to selected bacteriophages and animal viruses.</td>
<td>BIO 325 or 325H, and 126L with a grade of at least C- in each, and credit with a grade of at least C- or registration for BIO 330 or 333.</td>
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BIO 332: Yeast Cell Biology

Yeast is used as a model to teach some of the more actively researched areas of cell biology, such as chromosome structure, mating type, cell-cell interaction, DNA replication, mitosis, cytoskeletal motors, cell polarity, signal transduction, cell cycle, checkpoints, secretion, protein modification, yeast genetics, and yeast technology. 

**Prerequisites:** BIO 325 or 325H and BIO 126L and 326R with a grade of at least C- in each.

BIO 336: Tumor Biology (Spring)

Natural history and causal mechanisms of cancer; viral and chemical carcinogens. 

**Prerequisites:** BIO 325 or 325H and BIO 330 or 360K with a grade of at least C- in each.

BIO 337: Topic: Emerging Infectious Disease

BIO 339: Metabolism and Biochemistry of Microorganisms

A study of the metabolic processes of microorganisms, using a biochemical approach. 

**Prerequisites:** BIO 126L and 326R with a grade of at least C- in each, and CH 310M and 310N.

BIO 347: Biology and Genetics of Immune Disorders (Fall)

Immune disorders in mammals, including humans, used as models for examining basic immunological and immunogenetic principles; emphasis on immune disorders of vertebrates. 

**Prerequisites:** BIO 325 or 325H with a grade of at least C-.

BIO 360K: Immunology

The basic concepts of humoral and cell-associated immune phenomena. 

**Prerequisites:** BIO 325 or 325H and BIO 126L and 326R with a grade of at least C- in each.

BIO 160L: Immunology Laboratory

Current techniques in experimental cellular and humoral immunology. 

**Prerequisites:** Credit with a grade of at least C- or registration for BIO 360K.

BIO 360M: Molecular Immunology

An advanced immunology course with an emphasis on molecular models and medical relevance. 

**Prerequisites:** BIO 325 or 325H with a grade of at least C-, and BIO 360K with a grade of at least B-.

BIO 361: Human Infectious Diseases

Etiology, pathogenesis, diagnosis, and immunobiology of the major microbial diseases, with emphasis on their prevention. 

**Prerequisites:** BIO 325 or 325H and BIO 126L and 326R with a grade of at least C- in each.

BIO 361L: Public Health Bacteriology Laboratory

Training in techniques required for independent work in diagnostic and epidemiological bacteriology. 

**Prerequisites:** BIO 325 or 325H and BIO 126L and 326R with a grade of at least C- in each.

BIO 365T: Neurobiology of Disease (Fall)

The neurobiological basis of disorders of the brain, with the main focus on mental illness. Emphasizes the neural circuitries and neurochemical events that underlie specific mental processes and behaviors. 

**Prerequisites:** BIO 325 or 325H and BIO 365R or 371M with a grade of at least C- in each.

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4. SOCIAL ASPECTS OF HEALTH AND DISEASE:
<table>
<thead>
<tr>
<th>Course Code</th>
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<tr>
<td>CH 369:</td>
<td>Fundamentals of Biochemistry</td>
<td>A survey course covering the basics of protein structure and function, carbon and nitrogen metabolism, and molecular biology of macromolecules. <strong>Prerequisites:</strong> CH 320M or 318M with a grade of at least C-.</td>
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<tr>
<td>GRG 357:</td>
<td>Medical Geography</td>
<td>The geographic distribution, expansion, and contraction of the infectious diseases that have the greatest influence in shaping human societies today: malaria, aids, and others. <strong>Prerequisites:</strong> Upper Division Standing</td>
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<tr>
<td>PHR 350K:</td>
<td>Drugs in Our Society</td>
<td>Survey of drug development, drug actions and abuse potential, and sociological aspects of drug use. <strong>Prerequisites:</strong> Upper Division Standing</td>
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<tr>
<td>PHL 325M:</td>
<td>Medicine, Ethics, and Society</td>
<td>Moral, legal, religious, and political implications of developments in medicine; topics include abortion, euthanasia, sterilization, psychosurgery, genetic engineering; concepts of health, cure, insanity, and death. <strong>Prerequisites:</strong> None</td>
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<tr>
<td>SOC 319:</td>
<td>Introduction to Social Demography*</td>
<td>Social consequences of changes in fertility, mortality, migration, and population growth and composition. <strong>Prerequisites:</strong> None</td>
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<tr>
<td>SOC 330C:</td>
<td>Death and Dying: Social Perspective</td>
<td>Sociological perspectives on definitions of death; group differences in mortality rates and causes of death; social meanings of death and dying; treatment of the dying and the dead; and grief and bereavement. <strong>Prerequisites:</strong> Upper Division Standing</td>
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<tr>
<td>SOC 336C:</td>
<td>American Dilemmas</td>
<td>Examines a variety of critical American social problems, including problems in the economic, political, and health care systems, as well as inequities based on income, gender, and race. <strong>Prerequisites:</strong> Upper Division Standing</td>
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<tr>
<td>SOC 336D:</td>
<td>Sociology to Health and Illness</td>
<td>Applications of sociological concepts and principles to the study of health professions, medical institutions, community medical organization, and the distribution of illness. <strong>Prerequisites:</strong> Upper Division Standing</td>
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<tr>
<td>SOC 354K:</td>
<td>Sociology to Health and Illness</td>
<td>Applications of sociological concepts and principles to the study of health professions, medical institutions, community medical organization, and the distribution of illness. <strong>Prerequisites:</strong> Upper Division Standing</td>
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<tr>
<td>SOC 358D</td>
<td>Population and Society</td>
<td>The study of populations, including their growth, age structure, and patterns of fertility, mortality, and migration; the social causes and consequences of these phenomena. <strong>Prerequisites:</strong> Upper Division Standing</td>
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*SOC 319 and SOC 369K may not both be counted*

### 5. PROBLEMS OF DEVELOPING COUNTRIES:

<table>
<thead>
<tr>
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<tr>
<td>BIO 351:</td>
<td>Economic Botany</td>
<td>An in-depth analysis of the origin of domesticated plant species, the role in nature of plant products, and the ways natural products have been altered through artificial selection. <strong>Prerequisites:</strong> BIO 325 or 325H with a grade of at least C-.</td>
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<td>GRG 340D:</td>
<td>Political Ecology of Globalization and Environmental Degradation</td>
<td>Study of current environmental problems from the perspective of political ecology, which critically examines political, economic, and social relations between humans and the natural world. Uses case studies from Africa, Latin</td>
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</table>
America, Asia, and the Middle East to address climate change, deforestation, desertification, biodiversity, and environmental justice.

**Prerequisites:** Upper Division Standing

GRG 342C: Sustainable Development

Historical and contemporary analysis of international development with a focus on the prospects for environmental sustainability.

**Prerequisites:** Upper Division Standing

GRG 346: The Human Use of the Earth

The state of the world from an ecological perspective. Case studies are drawn from a wide range of ecological settings and involve both traditional and modern societies.

**Prerequisites:** Upper Division Standing

GRG 356: Topic: Environmental Ethics

Topics include environmental assessment methods and techniques, the conservation movement, and climate and people.

**Prerequisites:** None

GRG 356T: Topic: Global Societies

GRG 357: Medical Geography

The geographic distribution, expansion, and contraction of the infectious diseases that have the greatest influence in shaping human societies today: malaria, aids, and others.

**Prerequisites:** Upper Division Standing

GRG 358: Cities in Developing Countries

Comparative analysis of demographic, social, economic, and political features of cities in Latin America, the Middle East, Asia, and Africa; emphasis on regional imbalance, migration, occupational and social stratification, housing the poor, and suburbanization. Possibilities for individual research.

**Prerequisites:** None

SOC 319: Introduction to Social Demography

Social consequences of changes in fertility, mortality, migration, and population growth and composition.

**Prerequisites:** None

SOC 324K:

Overview of changing social structure in the Third World.

**Prerequisites:** Upper Division Standing

SOC 340C:

**Prerequisites:** Upper Division Standing

SOC 346

Examination of urbanization from a cross-national perspective: discrimination and racial inequality in urban labor markets.

**Prerequisites:** Upper Division Standing

SOC 369K:

The study of populations, including their growth, age structure, and patterns of fertility, mortality, and migration; the social causes and consequences of these phenomena.

**Prerequisites:** Upper Division Standing

SOC 369L:

Formal demography; stable population theory; life tables and techniques of mortality estimation; estimates and projections.

**Prerequisites:** Upper Division Standing

6. HUMAN IMPACT ON THE ENVIRONMENT:

BIO 359: Global Environmental Change

Global change as it affects terrestrial ecosystems, including feedback between ecosystems and the atmosphere. Green-house gases and global warming, ozone, biological invasions, and land-use change.

**Prerequisites:** BIO 325 or 325H with a grade of at least C-, and BIO 322 or
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
<th>Prerequisites</th>
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<tr>
<td>BIO 373</td>
<td>Ecology*</td>
<td>An introduction to ecology, the study of relationships among organisms and between organisms and their environment; adaptations, population, communities, and ecosystems. Includes both plants and animals and both terrestrial and aquatic ecosystems.</td>
<td>BIO 325 or 325H with a grade of at least C-.</td>
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<tr>
<td>BIO 373L</td>
<td>Ecology Laboratory</td>
<td>Intensive field ecology. Includes group field experiment and observation, independent projects, and field trips to other vegetation zones. Students complete weekly write-ups of observation and data analysis, reports of independent projects, and an oral presentation on an independent project.</td>
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<tr>
<td>BIO 375</td>
<td>Conservation Biology</td>
<td>Application of principles of ecology to the preservation of wild plant and animal species and to the preservation, management, and restoration of natural and seminatural ecosystems. Emphasis on scientific, biological aspects of issues such as endangered species protection, preserve design, and forest management.</td>
<td>BIO 325 or 325H and BIO 357, 359J, or 373 with a grade of at least C- in each.</td>
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<tr>
<td>BIO 478T</td>
<td>Natural Resource Management (Spring)</td>
<td>Land management, policy and regulation development, and ecological &quot;footprint&quot; evaluation. Students have the opportunity for practical application of these subjects through off-campus field projects.</td>
<td>BIO 325 or 325H with a grade of at least C-; and one of the following: BIO 351, 357, 373, 375, GRG 334 or 346 or consent of instructor.</td>
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<tr>
<td>GRG 334</td>
<td>Conservation, Resources, and Technology</td>
<td>Analysis of the relationship between the human population and its resource base, with particular emphasis on current problems in environmental resource management.</td>
<td>Upper Division Standing</td>
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<tr>
<td>GRG 335N</td>
<td>Landscape Ecology</td>
<td>The study of spatial patterns in the earth's biosphere found within landscapes, typically areas measured in square kilometers. Examines the processes that create those patterns, drawing from ecology, biogeography, and many other disciplines. Also explores the practical applications of landscape ecology to the study of natural environments and those managed or altered by human activities.</td>
<td>Upper-division standing and 3 hrs coursework in physical geography or geological or natural sciences.</td>
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<tr>
<td>GRG 336C</td>
<td>National Parks and Protected Areas</td>
<td>The history, purpose, and meaning of national parks (and preserves, refuges, and other publicly protected natural areas), from their inception at Yellowstone in 1872 to their present global distribution. Emphasis is on key management issues and dilemmas in the parks today; and the adoption and modification of Western notions of nature preservation within non-Western cultural settings.</td>
<td>Upper-division standing or consent of instructor.</td>
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<tr>
<td>GRG 346</td>
<td>The Human Use of the Earth</td>
<td>The state of the world from an ecological perspective. Case studies are drawn from a wide range of ecological settings and involve both traditional and modern societies.</td>
<td>Upper Division Standing</td>
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<tr>
<td>GRG 365T</td>
<td>Topic: Environment</td>
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<td>Course</td>
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<td>GRG 365T</td>
<td>Development and Food Production</td>
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<td>GRG 366K: Biogeography</td>
<td>Contemporary patterns of plant and animal distribution, and the environmental and historical processes affecting them. Prerequisites: UPD standing and 3 hrs coursework in physical geography or geological or natural sciences.</td>
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<tr>
<td>GRG 367K: Vegetation Ecology</td>
<td>Plant autecology and synecology. Ecological factors and processes of plant communities. Vegetation geocology, succession, and dynamics. Prerequisites: UPD standing and 6 hrs coursework in physical geography or geological or natural sciences.</td>
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<td>MNS 320</td>
<td>Study of ecological processes at different levels of integration in marine ecosystems. Prerequisites: BIO 311D, and CH 302 or 302H.</td>
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<td>MNS 120L (Spring)</td>
<td>A laboratory course with two weekend field trips to the Marine Science Institute at Port Aransas to perform ecological studies in the Texas coastal zone. Prerequisites: Credit or registration for MNS 320.</td>
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<tr>
<td>MNS 354Q: Marine Environmental Science (summer in Port Aransas)</td>
<td>Application of the principles of marine science to the study of environmental issues: toxicology, biogeochemical cycles, and biological and ecological impacts of xenobiotic materials in the coastal zone. <strong>Prerequisites:</strong> BIO 311D, and CH 302 or 302H.</td>
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<td>PHL 325C</td>
<td>Moral issues concerning the relation of human beings to the environment, including biodiversity, resource depletion, and animal rights. <strong>Prerequisites:</strong> Upper Division Standing</td>
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<tr>
<td>SOC 319</td>
<td>Social consequences of changes in fertility, mortality, migration, and population growth and composition. <strong>Prerequisites:</strong> None</td>
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