

# BIOLOGY (BIO)

Division: Biology, Chemistry and Physics Division

## BIO 100 Foundations of Biology (4 Credits)

This course is a beginning laboratory science class for students who plan to continue into medical, biological or related sciences. BIO 100 covers selected biology topics and introduces examples of physical science vocabulary and theory related to biological study. The aim of BIO 100 is to provide a background for the student who has never studied biology, to succeed in more advanced biology courses such as BIO 103 – 104, BIO 121 – 122, and BIO 211. This course also prepares students for chemistry, pharmacology and nursing requirements. Topics include: systems, tissues, inorganic and organic body chemistry, cells, cell membranes and cell respiration. Laboratory includes measuring instruments, microscopy and dissection techniques. This course is open to Biology/Pre-Medicine and General Science majors only. This course reviews fundamental concepts in life sciences to enable students to succeed in more advanced courses, beginning with BIO 103. BIO 100 will not fulfill any part of the science requirement toward graduation for either science majors or non-science majors.

**Pre-requisites:** ((Companion Arithmetic with a score of 069 and Companion Elementary Algebra with a score of 076) or (Arithmetic (Next-Gen) with a score of 260 and Quant,Algebra,Stats(Next-Gen) with a score of 260) or (Bilingual Computation with a score of 20 and Bilingual Algebra with a score of 19) or Move Up Math 092 with a score of P or MTH 092 Summer Bridge with a score of P or TRANSFERRED COLLEGE LEVEL MATH with a score of 898 or Elig. for Math 100,101,103 with a score of 905 or Pre-reg. COLG math waiver only with a score of 908 or SAT/ACT Elig for Mth 100 with a score of 994) and (((Companion Essay with a score of 06 or Companion Essay with a score of 07 or Write Placer Essay with a score of 04 or Write Placer Essay with a score of 05 or Write Placer Essay with a score of 06) and (Companion Reading Comprehensio with a score of 079 or Reading (Next-Gen) with a score of 237 or Move Up English 096 with a score of P or ENG 096 Summer Bridge with a score of P)) or Companion Essay with a score of 08 or Write Placer Essay with a score of 07 or Write Placer Essay with a score of 08 or TRANSFERRED ENG 101 with a score of 889 or Elig. for Eng 101 with a score of 904 or Pre-reg. Eng 101 waiver only with a score of 906 or SAT/ACT Elig for Eng 101 with a score of 993 or TRANSFERRED ENG 102 with a score of 998)) or COLLEGE DEGREE with a score of 988 or SAT/ACT Elig Eng101 Mth100 with a score of 995 or Transf. Eng 101 Mth 100 with a score of 999

## BIO 101 College Biology I (4 Credits)

This course is designed to develop, from a conceptual approach, meaningful understanding of some fundamental principles as they relate to the living world. Particular emphasis is placed on the unity and diversity of life forms and their relationship to each other and to their environment. This course can be taken to satisfy the science requirement of non-science majors, and can be taken independent of, or before, or after BIO 102. Materials for the course can be found at <http://eccbiology.blogspot.com>. This course is open to non-science and General Science majors only. BIO 101 will not fulfill any biology requirement for Biology/Pre-Medicine majors.

**Pre-requisites:** (((Companion Essay with a score of 06 or Companion Essay with a score of 07 or Write Placer Essay with a score of 04 or Write Placer Essay with a score of 05 or Write Placer Essay with a score of 06) and (Companion Reading Comprehensio with a score of 079 or Reading (Next-Gen) with a score of 237 or Move Up English 096 with a score of P or ENG 096 Summer Bridge with a score of P)) or Companion Essay with a score of 08 or Write Placer Essay with a score of 07 or Write Placer Essay with a score of 08 or TRANSFERRED ENG 101 with a score of 889 or Elig. for Eng 101 with a score of 904 or Pre-reg. Eng 101 waiver only with a score of 906 or SAT/ACT Elig for Eng 101 with a score of 993 or TRANSFERRED ENG 102 with a score of 998 ) or COLLEGE DEGREE with a score of 988 or SAT/ACT Elig Eng101 Mth100 with a score of 995 or Transf. Eng 101 Mth 100 with a score of 999

## BIO 102 College Biology II (4 Credits)

Using a conceptual approach, this course places emphasis on human biology and evolution. Basic principles concerning the structure and function of human body systems in both health and disease conditions are studied. This course can be taken to satisfy the science requirement of non-science majors and can be taken independent of, before, or after BIO 101. Materials for the course can be found at <http://eccbiology.blogspot.com>. This course is open to non-science and General Science majors only. BIO 102 will not fulfill any biology requirement for Biology/Pre-Medicine majors.

**Pre-requisites:** (((Companion Essay with a score of 06 or Companion Essay with a score of 07 or Write Placer Essay with a score of 04 or Write Placer Essay with a score of 05 or Write Placer Essay with a score of 06) and (Companion Reading Comprehensio with a score of 079 or Reading (Next-Gen) with a score of 237 or Move Up English 096 with a score of P or ENG 096 Summer Bridge with a score of P)) or Companion Essay with a score of 08 or Write Placer Essay with a score of 07 or Write Placer Essay with a score of 08 or TRANSFERRED ENG 101 with a score of 889 or Elig. for Eng 101 with a score of 904 or Pre-reg. Eng 101 waiver only with a score of 906 or SAT/ACT Elig for Eng 101 with a score of 993 or TRANSFERRED ENG 102 with a score of 998 ) or COLLEGE DEGREE with a score of 988 or SAT/ACT Elig Eng101 Mth100 with a score of 995 or Transf. Eng 101 Mth 100 with a score of 999

**BIO 103 General Biology I (4 Credits)**

This course explores the basic principles which govern the behavior of living matter on the molecular and cellular level. Topics covered include: characteristics of important biological macromolecules, cell metabolism and energetics, cell structure, cell division, and fundamentals of modern genetics.

**Pre-requisites:** ((Companion Arithmetic with a score of 069 and Companion Elementary Algebra with a score of 076) or (Arithmetic (Next-Gen) with a score of 260 and Quant,Algebra,Stats(Next-Gen) with a score of 260) or (Bilingual Computation with a score of 20 and Bilingual Algebra with a score of 19) or MTH 092 with a minimum grade of C or Move Up Math 092 with a score of P or MTH 092 Summer Bridge with a score of P or TRANSFERRED COLLEGE LEVEL MATH with a score of 898 or Elig. for Math 100,101,103 with a score of 905 or Pre-reg. COLG math waiver only with a score of 908 or SAT/ACT Elig for Mth 100 with a score of 994) and ((Companion Essay with a score of 06 or Companion Essay with a score of 07 or Write Placer Essay with a score of 04 or Write Placer Essay with a score of 05 or Write Placer Essay with a score of 06) and (Companion Reading Comprehensio with a score of 079 or Reading (Next-Gen) with a score of 237 or RDG 096 with a minimum grade of C) and (ENG 096 with a minimum grade of C or ENG 098 with a minimum grade of C or Move Up English 096 with a score of P or ENG 096 Summer Bridge with a score of P) or ESL 063 with a minimum grade of C) or Companion Essay with a score of 08 or Write Placer Essay with a score of 07 or Write Placer Essay with a score of 08 or TRANSFERRED ENG 101 with a score of 889 or Elig. for Eng 101 with a score of 904 or Pre-reg. Eng 101 waiver only with a score of 906 or SAT/ACT Elig for Eng 101 with a score of 993 or TRANSFERRED ENG 102 with a score of 998)) or COLLEGE DEGREE with a score of 988 or SAT/ACT Elig Eng101 Mth100 with a score of 995 or Transf. Eng 101 Mth 100 with a score of 999

**BIO 104 General Biology II (4 Credits)**

A continuation of BIO 103, this course covers evolution, organization of cells into tissues and organs, organ systems, comparative physiological studies among plants and among animals, structure and function relationships.

**Pre-requisites:** BIO 103 with a minimum grade of C

**BIO 116 Intro to Anatomy & Physiology (4 Credits)**

BIO 116 is an entry-level course pertaining to the organization of the human body for students interested in pursuing careers in biology and health-related professions. Students with little or no science background will gain a foundation in the basic concepts of anatomical terminology, biochemistry, cell biology, and tissue structure, as well as an introduction to selected organ systems. The laboratory enhances the lectures and includes measurement, microscopy, and dissection techniques. This course is a pre-requisite for BIO 121 – Anatomy & Physiology I.

**Pre-requisites:** ((Companion Arithmetic with a score of 069 and Companion Elementary Algebra with a score of 076) or (Arithmetic (Next-Gen) with a score of 260 and Quant,Algebra,Stats(Next-Gen) with a score of 260) or (Bilingual Computation with a score of 20 and Bilingual Algebra with a score of 19) or Move Up Math 092 with a score of P or MTH 092 Summer Bridge with a score of P or TRANSFERRED COLLEGE LEVEL MATH with a score of 898 or Elig. for Math 100,101,103 with a score of 905 or Pre-reg. COLG math waiver only with a score of 908 or SAT/ACT Elig for Mth 100 with a score of 994) and ((Companion Essay with a score of 06 or Companion Essay with a score of 07 or Write Placer Essay with a score of 04 or Write Placer Essay with a score of 05 or Write Placer Essay with a score of 06) and (Companion Reading Comprehensio with a score of 079 or Reading (Next-Gen) with a score of 237 or Move Up English 096 with a score of P or ENG 096 Summer Bridge with a score of P) or ESL 063 with a minimum grade of C) or Companion Essay with a score of 08 or Write Placer Essay with a score of 07 or Write Placer Essay with a score of 08 or TRANSFERRED ENG 101 with a score of 889 or Elig. for Eng 101 with a score of 904 or Pre-reg. Eng 101 waiver only with a score of 906 or SAT/ACT Elig for Eng 101 with a score of 993 or TRANSFERRED ENG 102 with a score of 998)) or COLLEGE DEGREE with a score of 988 or SAT/ACT Elig Eng101 Mth100 with a score of 995 or Transf. Eng 101 Mth 100 with a score of 999

**BIO 121 Anatomy & Physiology I (4 Credits)**

This course on human anatomy and physiology covers integration and regulation of physiological processes with emphasis on the structural and functional interrelationships. Lecture topics include: chemical and physical constituents of living material; cell structure and function; tissues, their arrangements and their contributions to systemic function; development and functions of the skeletal system; muscle anatomy and physiology; and the nervous system. The laboratory work serves to enhance the lectures through detailed discussions, hands-on examination of specimens, and problem solving.

**Pre-requisites:** ((Companion Arithmetic with a score of 069 and Companion Elementary Algebra with a score of 076) or (Arithmetic (Next-Gen) with a score of 260 and Quant,Algebra,Stats(Next-Gen) with a score of 260) or (Bilingual Computation with a score of 20 and Bilingual Algebra with a score of 19) or MTH 092 with a minimum grade of C or Move Up Math 092 with a score of P or MTH 092 Summer Bridge with a score of P or TRANSFERRED COLLEGE LEVEL MATH with a score of 898 or Elig. for Math 100,101,103 with a score of 905 or Pre-reg. COLG math waiver only with a score of 908 or SAT/ACT Elig for Mth 100 with a score of 994) or TRANSFERRED ENG 101 with a score of 889 or Pre-reg. Eng 101 waiver only with a score of 906 or COLLEGE DEGREE with a score of 988 or Transf. Eng 101 Mth 100 with a score of 999)

**BIO 122 Anatomy and Physiology II (4 Credits)**

This course builds on Anatomy and Physiology I. Lecture topics include: structure and function of the special sense organs, circulatory system, respiratory system, and digestive system, basic concepts of metabolism, excretory system, water and salt metabolism, and endocrine and reproductive systems. The laboratory experience serves to enhance the topics covered in lectures.

**Pre-requisites:** BIO 121 with a minimum grade of C

**BIO 125 Anatomy and Phys of The Eye (3 Credits)**

This course will build from a basic overview of human anatomy and physiology to a specific focus on the anatomy and physiology of the eye. Emphasis will be placed on embryological development of the eye, exploration of the normal structure and function of ocular tissue and their interrelationship with other systems and how the eye relates to contact lenses. Considerations will be given to anatomical abnormalities and pathophysiology of the visual system. Laboratory demonstrations will include: eye dissection, examination of pathological processes, visual testing and visual perception experimentation. This course is open only to students in the Vision Care Technology Program.

**BIO 210 Scientific Research Methods (2 Credits)**

This course provides students with an opportunity to learn the process of conducting research in sciences. Emphasis will be placed on scientific research- including the scientific method, research methods, sourcing information, literature review, formulation of a hypothesis, data collection, assessment and interpretation of results based on the available data and writing a research paper. Students are required to present their work to an audience.

**Pre-requisites:** (BIO 104 with a minimum grade of C) and (MTH 119 with a minimum grade of C)

**BIO 211 Microbiology (4 Credits)**

Microbiology is the study of microorganisms, and as such, this course examines life at the microscopic level (including eukaryotic cells: protozoa and fungi; prokaryotic cells: bacteria, rickettsia and mycoplasma; viruses: viroids; and infectious agents: prions). Lecture and laboratory sessions consider techniques in conventional culturable methods and examination and identification of microorganisms. Topics to be covered include nutritional requirements, environmental constraints, biochemical activities, genetic make-up and expression. Additionally, the role that microorganisms play in human and animal hosts during health and disease will be explored. Also included are aspects in pathogenicity, virulence, immunology, natural defense and environmental control factors. Laboratory sessions consider techniques in aseptic technique and sterile transfer, instrumentation (e.g., microscopy and pipetting), culturing bacteria, application of critical analysis of experimental data and presentations.

**Pre-requisites:** ((BIO 103 with a minimum grade of C and BIO 104 with a minimum grade of C) or (BIO 121 with a minimum grade of C and BIO 122 with a minimum grade of C)) and (CHM 101 with a minimum grade of C or CHM 103 with a minimum grade of C)

**BIO 220 Intro to Environmental Science (4 Credits)**

An introduction to an interdisciplinary field that focuses on how different elements of the environment (the biological, chemical and the physical) interact and interrelate. Our study of environmental science will encompass various aspects of biology, chemistry, economics, hydrology, physics, law and other social sciences. Topical environmental issues like climate change, aquatic and terrestrial ecology, air and water pollution, world human population problems, and the unsustainable use of natural resources will be examined. Laboratory sessions include measurements of various environmental pollutants, fundamental lab exercises in ecology, analysis of environmental parameters, and descriptive and practical reinforcement of lecture material.

**BIO 222 Kinesiology (4 Credits)**

The principles of force and leverage are emphasized in this course. The kinematics and kinetics of human movement are also covered. The course will include aspects of the skeletal, muscular, and nervous systems as they apply to human movement. Goniometry, ROM, and lever systems are revisited in the laboratory. These above principles are discussed in the context of practical application by a Physical Therapist Assistant.

**BIO 225 Plant Science (4 Credits)**

This course introduces students to the fundamentals of plant growth and development, and the relationship of plants to their environment. Topics include plant evolution and species diversity, anatomy and physiology of plants, water and nutrient use and management. Laboratory and field sessions complement lecture and enable students to use the scientific method while growing various plants using selected farming methods.

**Pre-requisites:** BIO 104 with a minimum grade of C

**BIO 228 Molecular Biology (4 Credits)**

BIO 228 is a study of the fundamental principles that guide cellular and molecular organization and function. Topics include membranes and cell signaling, the cytoskeleton and cell motility, the cell cycle, and regulation of gene expression. Laboratory sessions include the measurement of toxic effects of various chemicals on membrane integrity, practical applications of biotechnology to everyday problems, and the use of recombinant DNA technology to perform an authentic cloning experiment.

**Pre-requisites:** BIO 103 with a minimum grade of C and BIO 104 with a minimum grade of C

**BIO 230 Ecology and Evolution (4 Credits)**

BIO 230 is a work experience program where students are employed in a technical position in an industrial, government, academic, or organizational laboratory for the purpose of gaining practical experience in Biotechnology. Supervision of this departmentally approved position is provided by the college through on-the-job visits and individual progress review sessions. Students attend a weekly one hour seminar on campus and work a minimum of 180 hours per semester. Individuals must be recommended by the faculty of the Division of Biology and Chemistry, approved by the Chair of the Division, and, where necessary, registered with the Department of Cooperative Education.

**Pre-requisites:** BIO 103 with a minimum grade of C and BIO 104 with a minimum grade of C

**BIO 237 Genetics with Laboratory (4 Credits)**

This is an introductory course in Genetics for biology majors. The course follows a lecture/laboratory format to cover traditional topics in transmission genetics, gene mapping, molecular genetics, the organization of viral, prokaryotic and eukaryotic genes, regulation of gene expression, recombinant DNA technology, and population genetics. The laboratory places emphasis on techniques and instrumentation used in recombinant DNA technology, as well as other techniques that are used to investigate the structure, function, and transmission of inheritable information.

**Pre-requisites:** BIO 103 with a minimum grade of C and BIO 104 with a minimum grade of C

**BIO 241 Pathophysiology (3 Credits)**

This course will emphasize disease mechanisms, the various responses of the body to restore homeostasis, and the effect of these responses on normal function. Pathogenesis will be viewed at the molecular, cellular, tissue and systematic levels and be correlated with signs and symptoms. Diagnostic procedures and the rationale or treatment modalities will be covered for model diseases

**Pre-requisites:** BIO 121 with a minimum grade of C and BIO 122 with a minimum grade of C

**BIO 251 Pharmacology for Health Prof (3 Credits)**

This course is a beginning introduction to the study of pharmacology. The student will utilize the physical and social sciences as a framework for developing an understanding of drug action and usage. Selected classifications and families of drugs will be introduced on a weekly basis. The names, indications, mechanism, dosage range, side effects and adverse effects of individual drugs will be discussed. The format of the course will be a combination of lecture, group discussion and case presentation. This course is strongly recommended for nursing students.

**Pre-requisites:** BIO 121 with a minimum grade of C and BIO 122 with a minimum grade of C

**BIO 290 Honors Bio. Research Seminar (4 Credits)**

This laboratory course is designed for students in the Honors Program majoring in Biology/Pre-Medicine, Chemistry, Environmental Science or General Science. This course allows them to work on their Capstone Research projects in a lab setting. Lab safety, scientific method, equipment training and research methodology will be explored in conjunction with students' research projects. Research completed in the course will be the basis for the students' Honors Program presentations.

**Pre-requisites:** (BIO 103 with a minimum grade of B and BIO 104 with a minimum grade of B) or (BIO 121 with a minimum grade of B and BIO 122 with a minimum grade of B) or (CHM 103 with a minimum grade of B and CHM 104 with a minimum grade of B)