BIOLOGY (BIO)

BIO 101 General Biology I (4 CR.)
Focuses on biological processes with a chemical foundation, including macromolecules, cellular structure, metabolism, and genetics in an evolutionary context. Explores the core concepts of evolution; structure and function; information flow, storage and exchange; pathways and transformations of energy and matter; and systems biology. Emphasizes the process of science, interdisciplinary approach, and relevance of biology to society. Part I of a two-course sequence. Assignments require college-level reading fluency, coherent written communication, and basic mathematical skills. Credit toward graduation cannot be awarded for both BIO 101 and BIO 106. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) Eligible for ENG 111 and MTH 154 or completion of EDE 10 and MDE 10
This is a Passport and UCGS transfer course.
Credit for Prior Learning available for this course. More information at https://www.nvcc.edu/admissions/cpl.html.

BIO 102 General Biology II (4 CR.)
Focuses on biological processes with a chemical foundation, including macromolecules, cellular structure, metabolism, and genetics in an evolutionary context. Explores the core concepts of evolution; structure and function; information flow, storage and exchange; pathways and transformations of energy and matter; and systems biology. Emphasizes the process of science, interdisciplinary approach, and relevance of biology to society. Part II of a two-course sequence. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week. Prerequisite: BIO 101 or Departmental Permission
Prerequisite(s) BIO 101, or division approval
This is a UCGS transfer course.
Credit for Prior Learning available for this course. More information at https://www.nvcc.edu/admissions/cpl.html.

BIO 106 Life Science (4 CR.)
Surveys the basic concepts of life science. Engages in the scientific process by developing hypotheses, gathering data, and analyzing results. Explores topics within the context of the societal implications of science. Intended for students not majoring in science. Assignments require college-level reading fluency, coherent written communication, and basic mathematical skills. Credit toward graduation cannot be awarded for both BIO 101 and BIO 106. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.
This is a Passport and UCGS transfer course.

BIO 110 General Botany (4 CR.)
Emphasizes plant life cycles, anatomy, morphology, taxonomy, and evolution. Considers the principles of genetics, ecology, and physiology. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) Eligible for ENG 111 or completion of EDE 10

BIO 141 Human Anatomy And Physiology I (4 CR.)
Presents the study of anatomy & physiology including anatomical terminology, homeostasis, histology, integumentary system, skeletal system, muscular system, and nervous system. Part I of II. Assignments require college-level reading fluency, coherent written communication, and basic mathematical skills. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week. Please see this link to understand the options available for this course prerequisite. https://catalog.nvcc.edu/mime/media/10/1138/BIO+141+Prereq+Slide.pdf
Prerequisite(s) BIO 101 with a grade of C or higher, or completion of NAS 2, or placement exam with 75% or higher
Credit for Prior Learning available for this course. More information at https://www.nvcc.edu/admissions/cpl.html.

BIO 142 Human Anatomy and Physiology II (4 CR.)
Integrates anatomy and physiology of cells, tissues, organs, and systems of the human body. This course is the second in a two part series. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) Completion of BIO 141 with a grade of C or better
Credit for Prior Learning available for this course. More information at https://www.nvcc.edu/admissions/cpl.html.

BIO 145 Basic Human Anatomy & Physiology (4 CR.)
Surveys human anatomy and physiology. Covers basic chemical concepts, cellular physiology, anatomy, and physiology of human organ systems. Assignments require college-level reading fluency, coherent written communication, and basic mathematical skills. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.
Credit for Prior Learning available for this course. More information at https://www.nvcc.edu/admissions/cpl.html.

BIO 147 Basic Laboratory Calculations for Biotechnology (1 CR.)
Prepares students to work effectively in a scientific laboratory through instruction of the metric system, scientific notation, exponents, solution making, pH readings, and the creation of standard curves for data analysis. Focus will be on quantitative skills needed to perform most basic laboratory work. Skills will be practiced and reinforced through application-based problems and hands on activities. 1 hours lecture
Prerequisite(s) Program placed, coenrolled in BIO250, or Biotechnology Program Head permission

BIO 150 Microbiology for Health Sciences (4 CR.)
Focuses on the general characteristics, cellular structure, and metabolism of microorganisms. Emphasizes microbial relationships with individual and community health. Includes impact of microbes on human health and disease, microbial pathogenicity, identifying and managing infectious diseases and controlling microbial growth, healthcare associated infections and epidemiology. Studies aseptic culturing techniques with hands-on experience in safe microbiology practices. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) BIO 101 or BIO 141
Credit for Prior Learning available for this course. More information at https://www.nvcc.edu/admissions/cpl.html.

BIO 165 Principles in Regulatory and Quality Environments for Biotechnology (2 CR.)
Prepares students to work effectively in a scientific field and explains the basics of the regulatory and quality environments encountered in a biotechnology or pharmaceutical field. Surveys the principles and practices used on a day-to-day basis in regulatory affairs and quality systems. Lecture 2 hours per week.
Prerequisite(s) Program placed, BIO180 with a C or better or biotechnology program head permission

BIO 180 Introduction to Careers in Biotechnology (1 CR.)
Exposes the student to the field of biotechnology including skills, opportunities, and employment opportunities. Introduces the requirements to complete training and facilitates the student's need in the construction of a student plan and educational goal. Lecture 1 hour per week.
Prerequisite(s) Program placed or biotechnology program head permission

BIO 205 General Microbiology (4 CR.)
Explores the structure and function of microorganisms and their relationship to the environment and humans. Emphasizes the various groups of microorganisms, their growth and metabolism, roles in the functioning of ecosystems, genetics, their roles in human health, the use of microbes in industrial applications and biotechnology and methods of microbial control. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) ENG 111, BIO 101, BIO 102, and CHM 111
Corequisite(s) CHM 112

BIO 206 Cell Biology (4 CR.)
Introduces the ultrastructure and functions of cells. Emphasizes cell metabolism, cell division, and control of gene expression. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) BIO 101, CHM 111, or division approval

BIO 207 General Zoology (4 CR.)
Eligible for ENG 111 or completion of EDE 10. Introduces the fundamental concepts of the diverse world of the animal kingdom, with emphasis on providing students with a comprehensive knowledge of the biological, behavioral, evolutionary, physiological, and ecological aspects of invertebrates and vertebrates. Lecture 3 hours. Recitation and Laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) BIO 101

BIO 231 Human Anatomy & Physiology I (4 CR.)
Integrates the study of gross and microscopic human anatomy with physiology, emphasizing the analysis and interpretation of physiological parameters, as they relate to clinical scenarios. Covers the integumentary system, skeletal system (including articulations), muscular system, and nervous system. Part I of II. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) BIO 101-102 and CHM 111-112

BIO 232 Human Anatomy & Physiology II (4 CR.)
Prerequisite is BIO 231 with a grade of C or better. Integrates the study of gross and microscopic human anatomy with physiology, emphasizing the analysis and interpretation of physiological parameters, as they relate to clinical scenarios. Covers the endocrine system, circulatory system, lymphatic system (including immunity), respiratory system, urinary system (including fluid, electrolyte, and acid-base balance), digestive system (including nutrient metabolism), and reproductive system (including prenatal development). Part II of II. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

BIO 250 Biotechnology Research Methods and Skills (3 CR.)
Program placed and co-enrollment in BIO 253. Provides students with knowledge and advanced laboratory skills needed for employment in the biotechnology industry. Focuses on use of basic and specialized lab equipment and techniques such as solution chemistry, cell culture, DNA extraction and analysis, and protein extraction and analysis. Emphasis is on lab safety, documentation, quality control, and use of standard operating procedures. Lecture 1 hour per week. Laboratory 6 hours per week. Total 7 hours per week.
Prerequisite(s) Completion of BIO 101

BIO 251 Protein Applications in Biotechnology (4 CR.)
Prepares students to understand protein structure and function and teaches the laboratory skills needed to successfully work with proteins. Focuses on levels of protein structure and protein function. Includes common laboratory assays for protein synthesis, purification, detection, and quantification. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) BIO 250 and BIO 253 with a C or better

BIO 252 Nucleic Acid Methods (4 CR.)
Provides students with advanced laboratory skills needed for employment in the biotechnology industry. Focuses on use of basic and specialized lab equipment and techniques such as solution chemistry, cell culture, DNA extraction and analysis, protein extraction and analysis. Emphasizes lab safety, documentation, quality control, and use of standard operating procedures Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.
Prerequisite(s) BIO 250 and BIO 253 with a C or better

BIO 253 Biotechnology Concepts (3 CR.)
Explores the growing field of biotechnology ranging from basic cellular and molecular biology concepts to both basic and advanced laboratory techniques. Emphasizes the application of biotechnology to medicine, agriculture, environmental science, and forensics. Includes discussion of the business, regulatory/legal, ethical, and societal issues of this topic as well as the growing field of bioinformatics. Lecture 3 hours per week.
Prerequisite(s) BIO 101 or BIO 173 with a C or better and program placed

BIO 254 Capstone Seminar in Biotechnology (2 CR.)
. Integrates principles, theories, and methods learned in prior courses in biotechnology. Promotes exposure to real-world experience through completion of group project(s) having a professional focus. Emphasizes collaboration, literature research, proposal development, and communication and presentation skills. Lecture 2 hours per week.
Prerequisite(s) Students must have completed 75% of their program requirements including BIO 147, BIO 165, BIO 180, BIO 250, and BIO 253 with a C or better, or biotechnology program head permission

BIO 255 Bioinformatics and Computer Applications in Biotechnology (2 CR.)
Covers basic computer concepts and Internet skills and uses a software suite, which includes word processing, spreadsheet, database, and presentation software to demonstrate skills. Introduces students to basic online tools and resources to retrieve and analyze biological data, such as DNA, RNA, and protein sequences, structures, functions, pathways, and interactions. Includes hands-on sessions to allow students to become familiar with these resources and their navigation and applications.
Prerequisite(s) Program placed, BIO 250 and BIO 253 with a C or better, or biotechnology program head permission

BIO 256 General Genetics (4 CR.)
Explores the principles of genetics ranging from classical Mendelian inheritance to the most recent advances in the biochemical nature and function of the gene. Includes experimental design and statistical analysis. Lecture 3 hours. Recitation and laboratory 3 hours.
Prerequisite(s) BIO 101-102 or equivalent

BIO 270 General Ecology (4 CR.)
Studies interrelationships between organisms and their natural and cultural environments with emphasis on populations, communities, and ecosystems. Lecture 3 hours. Lab and recitation 3 hours. Total 6 hours per week
Prerequisite(s) any two of the following courses: BIO 101, 102, 110, 120 or division approval

BIO 296 On-Site Training in: (1-5 CR.)
Career orientation and training program without pay in selected businesses and industry, supervised and coordinated by the College. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours.

BIO 299 Supervised Study (1-5 CR.)
Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hrs.