BIOLOGY (BIO)

BIO 100. Introduction to Life Science Laboratory Skills. 3 Credit Hours.
This course is part of the Certificate of Specialization in Life Science Laboratory Assistant program. Students will practice basic lab skills in a research laboratory setting. Pipetting, solution and media preparation, dilutions, sterile technique, separation methods, lab math, quality control, documentation, and other appropriate skills are taught with an emphasis on standard lab instrumentation, calibration or verification, and maintenance. Additional lab hours required.
Prerequisite: BIO 111 and Reading Proficiency.

BIO 103. Problems in Anatomy. 3 Credit Hours.
A course dealing with the anatomy of the human body; study of the structure of cells, tissues, organs, and systems with emphasis on those subjects important to embalming. Additional lab hours required.
Prerequisites: BIO 111 and Reading Proficiency.

BIO 104. Basic Laboratory Methods for Biotechnology. 3 Credit Hours.
This course introduces basic laboratory skills in preparation for Biotechnology I. Topics and techniques include safety, sterile technique, laboratory math, quality systems, documentation, collection of data, metrology, filtration, solution and mini prep, and other appropriate laboratory methods. Additional lab hours required.
Prerequisites: MTH 030, MTH 040, or MTH 050 with a minimum grade of 'C' and Reading Proficiency.

BIO 105. Topics in Evolution. 3 Credit Hours.
This is an introductory course emphasizing both evolutionary mechanisms and evolutionary history. Areas of interest will include evolution as a process, the development of biological diversity, reconstructing past evolutionary events, and the evolution of major groups, including humans.
Prerequisite: Reading Proficiency.

BIO 106. Human Heredity (MOTR LIFS 100LG). 4 Credit Hours.
Human Heredity will introduce students to basic concepts in human inheritance. Areas of emphasis will include patterns of inheritance, population genetics, the genetics of immunity and cancer, genetic engineering, gene therapy, and reproductive technologies. Prerequisite: Reading Proficiency.

BIO 109. Human Biology (MOTR BIOL 100). 3 Credit Hours.
Human Biology is an introduction to basic human structure and function, as well as the human body’s interaction with its surroundings, including cell theory, genetics, systems biology, ecology, and evolution.
Prerequisite: Reading Proficiency or concurrent enrollment in RDG 079.

BIO 110. General Zoology (MOTR BIOL 100LZ). 4 Credit Hours.
General Zoology provides a survey of the animal kingdom with emphasis on comparative anatomy, physiology, ecology, and evolution of the major invertebrate and vertebrate groups.
Prerequisite: Reading Proficiency.

BIO 111. Introductory Biology I (MOTR BIOL 100L). 4 Credit Hours.
Introductory Biology I provides a consideration of the principles of biology, with emphasis on the molecular approach to the structure and function of living organisms. This course is intended for liberal arts students and majors in physical and occupational therapy, nursing, and health science programs. (Credit is not allowed for both BIO 111 and BIO 140).
Prerequisite: Reading Proficiency or concurrent enrollment in RDG 079.

BIO 113. Modern Aspects of Biology (MOTR BIOL 100). 3 Credit Hours.
Modern Aspects of Biology provides a consideration of the principles of biology as they relate to socially relevant issues in nutrition, reproduction, sexuality, heredity, and disease.
Prerequisite: Reading Proficiency.

BIO 117. Conservation and Ecology. 3 Credit Hours.
This course focuses on the environment and the effects that mankind is having on the Earth. Interrelationships of living things to their environment and to each other are discussed with particular focus on the impact of humans on the environment. Mankind’s use and abuse of renewable and non-renewable natural resources are also considered.
Prerequisite: Reading Proficiency.

BIO 122. Human Sexuality. 3 Credit Hours.
Human sexuality includes not only the biological component of male and female sexuality but also attitudes, values and feelings about one’s own gender and sex role. Consequently, in dealing with sex as a natural biological function, the expression of which is a dimension of psychosocial behavior, the sexual development and/or differentiation of men and women from conception to maturity will be stressed. Same course as PSY 125.
Prerequisite: Reading Proficiency.

BIO 123. Animal Behavior. 3 Credit Hours.
This course is an introductory course in invertebrate and vertebrate animal behavior. Emphasis will be placed on biological clocks, migrational patterns, reproductive strategies and hormones. The reoccurring theme will be the role of genetics and evolution in driving behavior.
Prerequisite: Reading Proficiency.

BIO 124. General Botany I (MOTR BIOL 100LB). 4 Credit Hours.
General Botany I will introduce students to the biological aspects of plant life, including cell structure and function, anatomy, morphology, physiology, genetics, taxonomy, and the environmental factors that affect plant growth. The laboratory reinforces the topics and concepts covered in the lecture.
Prerequisite: Reading Proficiency.

BIO 140. Principles of Biology I (MOTR BIOL 150L). 5 Credit Hours.
Principles of Biology I presents an introduction to scientific methodology and biological principles applied to the molecular level of the structure and function of living organisms. This course is intended for pre-medicine, pre-dentistry, pharmacy, biology, and other science majors. (Credit is not allowed for both BIO 111 and BIO 140).
Prerequisites: CHM 105 and Reading Proficiency.

BIO 141. Principles of Biology II. 4 Credit Hours.
Principles of Biology II presents an introduction to scientific methodology and biological principles applied to the organism and suprorganism levels of biology. Topics covered include: population biology, evolution, and a survey of the major Domains and Kingdoms of living organisms. This course is intended for pre-medicine, pre-dentistry, biology, and other science majors.
Prerequisites: BIO 140 with a grade of C or better and Reading Proficiency.

BIO 148. Ozark Ecology. 3 Credit Hours.
This course introduces students to one of the most biological diverse ecosystems in the Midwest. It will focus on the interaction of plants and animals with unique Ozark natural communities such as oak-hickory forests, glades, bluffs, caves, springs, and streams. Management and land use practices affecting this ecosystem will be reviewed. An optional 1-2 week field experience course (BIO 149) is available to students who successfully complete this lecture course.
Prerequisite: Reading Proficiency.

BIO 151. Biology of Human Health and Disease (MOTR LIFS 100D). 3 Credit Hours.
Biology of Human Health and Disease will explore the evolution of microbes and human disease and the influences that regular exercise, diet, and genetic factors have on everyday good health. The course will also explore mechanisms, manifestations, and prevention of common diseases, such as heart disease and cancer.
Prerequisite: Reading Proficiency.
BIO 152. Quantitative Methods in Biotechnology. 2 Credit Hours.  
This course is designed to instruct students in the common calculations encountered in a cellular-molecular research setting.  
Prerequisites: MTH 140 and CHM 101 or CHM 105 and Reading Proficiency.

BIO 154. The Biology of Human Sex (MOTR LIFS 100R). 3 Credit Hours.  
The Biology of Human Sex covers male and female reproductive systems, sexual gender, sexually transmitted infections, contraception, assisted reproductive techniques and the development of the fetus. This course will also cover typical and atypical behaviors of sexuality.  
Prerequisite: Reading Proficiency.

BIO 157. Good Laboratory Practices, Compliance, and Bioinformatic Principles. 3 Credit Hours.  
Good Laboratory Practices, Compliance, and Bioinformatic Principles provides a general overview of the Food and Drug Administration (FDA) regulations as they pertain to the biotechnology field. Knowledge of current Good Laboratory Practices (cGLP) and current Good Manufacturing Practices (cGMP) is needed to work in biotechnology manufacturing and preclinical research laboratories. The course will emphasize practices of cGLP and cGMP that pertain to the biopharmaceutical industry as well as current standard operating procedures in Compliance, Bioinformatics, and Electronic Notebook usage. Recommended Preparation: Basic computer skills.  
Prerequisites: BIO 104 or BIO 111 or BIO 124 or BIO 140 or BIO 207 or BIO 225 with a grade of 'C' or better, and Reading Proficiency.

BIO 177. Food Science. 3 Credit Hours.  
Food Science introduces the fundamental biological, chemical, and physical scientific principles associated with the study of foods. Topics include food composition and nutrition, food additives, regulations, food safety, toxicology, food preservation, packaging, food biotechnology, product development, and sensory evaluation. Proper use of the scientific method will be utilized to conduct laboratory experiments.  
Prerequisite: Reading Proficiency.

BIO 203. General Microbiology I. 4 Credit Hours.  
Introduction to microbes with emphasis on morphology, culture techniques and biochemical activities of bacteria, viruses and fungi. A consideration of human disease producing organisms with regard to their infection and resistance. Additional lab hours required.  
Prerequisites: BIO 111 with grade of 'C' or better; or one year of high school biology and chemistry (with labs) within five previous years of registration date; or permission of the department chairperson of Biology and Reading Proficiency.

BIO 207. Anatomy and Physiology I (MOTR LIFS 150LAP). 4 Credit Hours.  
Anatomy and Physiology I is the study of inter-relationships between the structure and the function at gross and microscopic levels of the organization of living body. This course will use the body systems to emphasize the anatomical terminology, cellular, and tissue level of organization. Anatomy and Physiology I includes the integumentary, skeletal, muscular, nervous, and the endocrine systems. The laboratory component reinforces topics and concepts covered in lectures.  
Prerequisites: BIO 111 with grade of 'C' or better and Reading Proficiency.

BIO 208. Anatomy and Physiology II. 4 Credit Hours.  
A continuation of BIO 207 with consideration given to the integrative functions of the cardiovascular, digestive, respiratory, urogenital and reproductive systems. Additional lab hours required.  
Prerequisites: BIO 207 with a minimum grade of ‘C’ and Reading Proficiency.

BIO 209. Kinesiology Fundamentals. 3 Credit Hours.  
Kinesiology Fundamentals is the study of human movement. It involves applying the anatomy of the musculo-skeletal system to functional movement as a basis to understanding of exercise. Additional lab hours required.  
Prerequisites: BIO 207 with a grade of ‘C’ or better and Reading Proficiency.

BIO 218. Microbiology for Biotechnology. 4 Credit Hours.  
A course for biotechnology majors providing a detailed exposure to structure, metabolism, genetics and growth characteristics of microbes and viruses as well as the role they play in disease, ecological and industrial applications. The structure and function of the immune system will also be covered. Additional lab hours required.  
Prerequisites: BIO 140, CHM 105 and Reading Proficiency.

BIO 219. Biotechnology I. 5 Credit Hours.  
This course introduces basic biotechnology skills in preparation for Biotechnology II. Topics and techniques may include safety, cGMP, agarose gel electrophoresis, plasmid construction, ELISA, PAGE, PCR, mammalian cell culture, rapid plant genotyping and other molecular research techniques. Additional laboratory hours required.  
Prerequisites: BIO 104, BIO 140, BIO 152, GE 101, all with a minimum grade of ’C’ and Reading Proficiency.

BIO 220. Biotechnology II. 5 Credit Hours.  
A project-oriented course applying the fundamental DNA and protein manipulation techniques used in biotechnology/bioengineering research laboratories in academia and industry. Additional lab hours required.  
Prerequisites: BIO 219 or consent of the instructor and Reading Proficiency.

BIO 221. Workplace Learning: Biotechnology. 3 Credit Hours.  
This workplace-based course provides the student the opportunity to apply theory and skills learned in the classroom, learn new skills, and explore career possibilities while supervised by a professional in the field and a faculty member. Students will observe and participate in the functions of the industry to enhance their preparation for entering the field. Minimum of 50 hours per credit hour in the workplace throughout the term. Additional hours required.  
Prerequisites: Prior or concurrent enrollment in BIO 220 and Reading Proficiency.

BIO 222. Research Techniques in Biology. 1-3 Credit Hours.  
Students will participate in research projects that can include introduction to HPLC, cell culture, histology techniques, or research in molecular ecology or molecular genetics. Exposure to data processing, data analysis, poster or manuscript preparation and presentation may also be included. Contact the instructor for current research project information.  
Prerequisites: MTH 140, CHM 101 and BIO 111 or BIO 140 and Reading Proficiency.

BIO 225. Genetics. 5 Credit Hours.  
This course for life science majors reviews the fundamental principles of inheritance, including classical genetic theory, as well as recent advances in the molecular basis of heredity. Additional hours required.  
Prerequisites: BIO 140, CHM 105 and Reading Proficiency.

BIO 226. Advanced Topics in Biotechnology. 3 Credit Hours.  
This lecture/laboratory course consists of current techniques used in biotechnology research and industry. Topics can include, but are not limited to, techniques from biomedical, pharmaceutical, agricultural, environmental, microbiological, bioprocessing, biocomputing, and/or bioethical aspects of biotechnology. Life science research and industry scientists will be employed as instructors. Additional lab hours required.  
Prerequisites: Prior or concurrent enrollment in BIO 219 or consent of the program coordinator or department chair, and Reading Proficiency.

BIO 227. Biotechnology Capstone. 2 Credit Hours.  
Biotechnology Capstone focuses on the development and delivery of a scientific presentation. Corerequisite: BIO 220.  
Prerequisite: Reading Proficiency.
BIO 228. Research and Presentation Skills for the Life Sciences. 2 Credit Hours.
Research and Presentation Skills for the Life Sciences provides hands-on training, organizing, and presenting scientific data in document, poster, and oral formats. Students will write cover letters and resumes. Students will write written reports and create posters summarizing data generated in BIO 220 or from internships. This data will also be presented in poster format with corresponding oral presentations to various audiences. Mock employment interviews will also be conducted.
Corequisite: BIO 220.
Prerequisite: Entry into this course must be approved by the program coordinator, and Reading Proficiency.