

## Course Descriptions

### Biotechnology

#### **BIOT 1003 – Laboratory Safety and Regulatory Compliance**

This course provides the student with practice in OSHA requirements for personal protective equipment, safety showers, eye wash stations, fire fighting equipment and procedures, and safe behavior in the laboratory. Use of MSDS sheets, proper NFPA labeling, and specific safety protocols for laboratory equipment and chemicals are included. In addition, the student will receive experience in documentation of laboratory results, proper maintenance of a laboratory notebook, writing and following laboratory protocols, completion and use of a chain of custody, and maintenance of chemical inventory logs. Student is also introduced to federal regulations and regulatory agencies. Lecture 3 Hours. No Laboratory.

#### **BIOT 1014 – Standard Laboratory Techniques I**

This course provides the student with skills in calculation and application of scientific notation, significant figures, the metric system, use of conversion factors, percents, fractions, basic algebra and word problems, and creating and interpreting graphs. Student will also gain practice in performing common laboratory calculations. Lecture 4 Hours. No Laboratory.

#### **BIOT 1024 – Standard Laboratory Techniques II**

This course familiarizes the student with common laboratory glassware and utensils, balances, reading volume, utilization of pipettes and micropipettes, utilization of various heat sources and stirring devices, safe operation of the centrifuge and autoclave, and proper use and care of common laboratory equipment such the microscope and pH meter. Student will also gain practice in housekeeping duties and application of the scientific method. Lecture 1 Hour. Laboratory 3 Hours.

#### **BIOT 1103 – Introduction to Biotechnology**

This course serves as an orientation to the field of biotechnology and the Biotechnology Program at Meridian Technology Center. Students will become familiar with professional expectations of behavior and dress and will receive an introduction to the Career Technology Student Organizations. Students will become familiar with important events in the development of biotechnology, explore the applications of biotechnology in industry, agriculture, diagnostics, and medicine, and study the impact of bioethics on the field of science and their daily lives. Students will be required to research the career options available in the field of biotechnology and laboratory science, and will give an oral presentation about a specific field of study. Lecture 3 Hours. No Laboratory.

#### **BIOT 1034 – Fundamentals of Biotechnology I, 4 Credits**

This course provides students with practice in the preparation and staining of specimens for microscopic evaluation, identification of basic cell structures, preparation of chemical solutions from powders and liquids, aseptic technique, preparation of culture media, specimen handling protocols, maintenance of pure cell cultures, and microbial sensitivity testing. Lecture 1 Hour. Laboratory 3 Hours.

#### **BIOT 1044 – Fundamentals of Biotechnology II**

This course provides students with practice in the isolation, amplification, and characterization of DNA, and isolation and characterization of proteins. Students will also become familiar with the use of ELISA assays, and will receive advanced training on equipment use and maintenance. Lecture 2 Hours. Laboratory 2 Hours.

#### **BIOT 1115 – Agricultural and Pharmaceutical Biotechnology I**

This course provides the student with experience in maintenance and manipulation of plants in a laboratory setting (including growth, breeding, asexual reproduction, plant tissue culture, and genetic transformation of plants), as well as extraction and analysis of potential pharmaceuticals from plants and plant material. Lecture 2 Hours. Laboratory 3 Hours.

#### **BIOT 1215 – Agricultural and Pharmaceutical Biotechnology II**

This course provides the student with advanced training in the maintenance and manipulation of plants in a laboratory setting (including genetic transformation and cloning of plants), as well as continued practice in the extraction and analysis of potential pharmaceuticals from plants and plant material. Lecture 2 Hours. Laboratory 3 Hours.

#### **BIOT 1114 – Introduction to Forensics I**

This course introduces students to the principles and practices found in forensic science laboratories.

Topics covered in this course include crime scene procedures and practices, the collection of evidence, and the basis of analysis of that evidence. An emphasis will be placed on the proper procedures involved in maintaining the chain of custody of evidence in a variety of contexts. Lecture 4 Hours. No Laboratory.

#### **BIOT 1214 – Introduction to Forensics II**

Students will receive an introduction to the application of scientific methods for the examination of physical evidence in the criminal justice system; an overview of the forensic analysis of materials such as firearms, fingerprints, drugs, blood, hair, fibers, paint, glass, arson debris, etc. Lecture 3 Hours. Laboratory 1 Hour.

#### **BIOT 1124 – Introduction to Forensic Laboratory Techniques**

Students will receive hands-on training in the application of scientific methods for the examination of physical evidence in the criminal justice system in the laboratory environment. Lecture 1 Hour. Laboratory 3 Hours.

#### **BIOT 1054 – Fundamentals of Biotechnology Techniques I**

This course provides the student with advanced practice in in vitro DNA synthesis reactions, programming and use of thermal cyclers for PCR reactions, and utilization of real time PCR technology. Lecture 1 Hour. Laboratory 3 Hours.

#### **BIOT 1064 – Fundamentals of Biotechnology Techniques II**

This course provides the student with advanced practice in Southern and Western blotting techniques, protein extraction and analysis, and ELISA technology. Lecture 2 Hours. Laboratory 2 Hours.

#### **BIOT 1074 – Fundamentals of Biotechnology Techniques III**

This course provides the student with practice in the use and long-term maintenance of cell lines, including microbial, plant, and animal cell lines. Lecture 2 Hours. Laboratory 2 Hours.

#### **BIOT 1125 – Microbial Biotechnology I**

This course provides the student with skills in techniques commonly employed in the microbiology laboratory, including isolation of pure bacterial cultures from a variety of sources, utilization of specialized media, microbial sensitivity testing, freezing and long-term maintenance of bacterial cell lines, and utilization of automated plating and colony counting equipment and commercial microbial identification systems. Lecture 2 Hours. Laboratory 3 Hours.

#### **BIOT 1224 – Microbial Biotechnology II**

This course provides the student with experience in utilizing microbes in an industrial setting. Coursework covers topics such as bacterial transformation, the scale-up process, fermentation, and retrieval and purification of microbe-produced compounds. Lecture 2 Hours. Laboratory 2 Hours.

#### **BIOT 1225 – Wastewater and Environmental Testing Techniques**

This course introduces students to environmental samples, including the proper quality control measures which accompany sampling, testing, and clean up. A basic understanding of environmental laws, specifically in Oklahoma, is reviewed. The course prepares the student for the Class D Water and Waste Water License test. Lecture 3 Hours. Laboratory 2 Hours.

#### **BIOT 1135 – Introduction to Phlebotomy**

This course provides the student with a study of the basic concepts of phlebotomy and of the responsibilities of the phlebotomist. The course will cover such topics as job responsibilities, organizational structure of a laboratory, basic understanding of major body systems, collection equipment, blood collection procedures, infection control, safety, specimen transport and processing, quality control, and professionalism. Lecture 5 Hours. No Laboratory.

#### **BIOT 1234 – Phlebotomy Techniques**

This course provides the student with an overview of venipuncture and capillary puncture techniques for obtaining blood specimens for laboratory analysis. Lecture 1 Hour. Laboratory 3 Hours.

#### **BIOT 1223 – Phlebotomy Practicum**

This course provides the student with a clinical internship in a health care institution where knowledge and skills and actual job performance are integrated in a clinical program. No Lecture. Laboratory 3 Hours.

#### **BIOT 1243 – Medical Biotechnology Techniques I**

This course familiarizes the student with basic skills utilized in medical and diagnostic laboratories. The student will gain skills in sample collection and handling, blood collection and analysis, urinalysis, ELISA technology, cell counts, and tissue section preparation. Lecture 2 Hours. Laboratory 1 Hour.

#### **BIOT 1253 – Medical Biotechnology Techniques II**

This course provides the student with continued practice in skills utilized in medical and diagnostic

laboratories. The student will gain advanced skills in blood collection and analysis, urinalysis, ELISA technology, cell counts, and tissue section preparation. Lecture 1 Hour. Laboratory 2 Hours.

**BIOT 1260 – Biotechnology Laboratory Sciences Practicum**

Students who have a passing grade, appropriate attendance and professional behavior, the recommendation of the instructor, and transportation may be placed in industry sites for on-the-job training. Students may also obtain part-time paid employment in program-related areas and receive practicum credit. Alternatively, students may apply for a research project with a local PI. Research will be done in the Biotechnology laboratory under the supervision of the instructor. No Lecture. Laboratory 1-3 hours.