BIOTECHNOLOGY (BITC)

BITC 1191 Special Topics in Biological Technology/Technician 1 Credit (1 Lec, 0 Lab)
The course covers recently identified current events, skills, knowledge, and/or attitudes and behaviors pertinent to the technology or occupation and relevant to the professional development of the student. This course was designed to be repeated multiple times to improve student proficiency.
Course Type: Technical

BITC 1302 Biotechnology Laboratory Methods and Techniques 3 Credits (2 Lec, 2 Lab)
This course covers laboratory operations, management, equipment, instrumentation, quality control techniques, and safety procedures. Includes laboratory practice in using pH meters, spectrophotometers, preparing buffers and solutions, and performing measurements and separatory techniques.
Prerequisite(s): MATH 1314, CHEM 1311/CHEM 1111 or CHEM 1305/CHEM 1105, and BIOL 1306/BIOL 1106 or BIOL 2301/BIOL 2101 or Department Chair approval

Course Type: Technical

BITC 1340 Quality Assurance for the Biosciences 3 Credits (3 Lec, 0 Lab)
This course covers quality assurance principles and applications. Includes quality control and Federal Drug Administration (FDA) regulations to the biotechnology, biopharmaceutical, and biomedical device industries.
Co-requisite(s): BITC 1302
Course Type: Technical

BITC 1403 Principles of Biochemistry 4 Credits (3 Lec, 2 Lab)
This course covers the structure, function, and cellular metabolism of various bio-molecules. Concentrates on the intra- and intermolecular conversion of bio-molecules. Knowledge in this area is directly applicable to analysis and processing of bio-molecules and their pertinence to biotechnology as it relates to biopharmaceuticals, biodiagnostics, fermentation, and bio-manufacturing.
Prerequisite(s): BIOL 1306/BIOL 1106 and either CHEM 1305/CHEM 1105 OR CHEM 1311/CHEM 1111

Course Type: Technical

BITC 1411 Introduction to Biotechnology 4 Credits (3 Lec, 3 Lab)
This course is an introduction to biotechnology including career exploration, history and applications of biotechnology, molecular biology, bioethics, and laboratory safety practices.
Prerequisite(s): MATH 1314 OR MATH 1316 OR MATH 1324 OR MATH 1325 OR MATH 1342 OR MATH 1350, Reading level 7, Math level 9

Course Type: Technical

BITC 2377 Product Development to Commercialization 3 Credits (3 Lec, 0 Lab)
The course will provide students with an overview of drug discovery to commercialization of biologics-based therapeutics. The course covers drug discovery and development, scale-up, production, and FDA regulations that govern clinical trials through commercialization.
Course Type: Technical

BITC 2386 Internship - Biotechnology Laboratory Technician Capstone 3 Credits (0 Lec, 15 Lab)
This course is a work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. A learning plan is developed by the College and the employer. This is an internship experience where students are closely supervised under a trainer and apply their knowledge and training in a biomanufacturing laboratory. The experience may be internal at the College where the student works on independent projects including protocol development or batch run preparation under San Jacinto College instructors. Additionally, the experience can be external to the College, where the student is mentored and supervised by a workplace employee and San Jacinto College partners.
Prerequisite(s): A grade of C or higher and Department Chair approval for the following: BITC 1191, BITC 1340, and either BIOL 2320/BIOL 2120 or BIOL 2321/BIOL 2121

Course Type: Technical

BITC 2387 Internship - Biotechnology Laboratory Technician Experience 3 Credits (0 Lec, 15 Lab)
A work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. A learning plan is developed by the College and the employer. This is an internship experience where students are closely supervised by an industry partner and apply their knowledge and training in a biomanufacturing laboratory. The experience is external to the College with a written agreement between San Jacinto College and the industry partner. Students are mentored by the industry partner and achieve objectives developed by the College that match specified learning outcomes.
Prerequisite(s): A grade of C or higher and Department Chair approval for the following: BITC 1191, BITC 1340, and either BIOL 2320/BIOL 2120 or BIOL 2321/BIOL 2121

Course Type: Technical

BITC 2411 Biotechnology Laboratory Instrumentation 4 Credits (3 Lec, 3 Lab)
This course includes the theory, applications, and safe operation of various biotechnology-related analytical instruments. Addresses separation and identification techniques including electrophoresis, spectrophotometry, and chromatography.
Prerequisite(s): BITC 1302 or Department Chair approval

Course Type: Technical

BITC 2431 Cell Culture Techniques 4 Credits (3 Lec, 3 Lab)
This course covers the theory and applications of cell culture techniques. Laboratory emphasis on the principles and practices of applications such as initiation, cultivation, maintenance, and preservation of cell lines.
Prerequisite(s): BITC 2411 or Department Chair approval

Course Type: Technical

BITC 2441 Molecular Biology Techniques 4 Credits (3 Lec, 3 Lab)
This course includes an in-depth coverage of the theory and laboratory techniques in molecular biology with an emphasis on gene expression and regulation, recombinant DNA, and nucleic acids.
Prerequisite(s): BITC 2411 and either BIOL 2320/2120 OR BIOL 2321/2121 or Department Chair approval

Course Type: Technical

BITC 2445 Medical Biotechnology 4 Credits (3 Lec, 3 Lab)
This course covers biotechnology as it applies to medicine and medical research. Includes molecular mechanisms underlying diseases such as cancer, diabetes, heart disease, and AIDS. Covers the applications of biotechnology to the diagnosis and treatment of disease as well as the development of drugs and therapeutic agents. Emphasizes research and medical-related biotechnology methods and laboratory procedures.
Prerequisite(s): BITC 1411, BITC 1302, BITC 2377 or Department Chair approval

Course Type: Technical

BITC 2475 Upstream and Downstream Manufacturing of Biologics 4 Credits (2 Lec, 5 Lab)
This course includes provides lab-based instruction and training in upstream and downstream manufacturing processes used in the production of a biologics-based therapeutic products.
Course Type: Technical