



## **Division of Science, Technology, Engineering and Mathematics**

### **Associate in Science in Biotechnology: Genomics & Biomanufacturing**

In recent years, our knowledge in biology has been transformed by emergence of genomics and its focus on comprehensive and data-intensive approaches to the study of living organisms through (1) expanding our fundamental understanding of genome structure and function, (2) making previously tricky and expensive experiments more straightforward, reliable, accurate and cheaper, (3) enabling new avenues of investigation (4) profoundly altering our understanding of human diseases and medicine (5) focusing on comprehensive and high-throughput approaches to questions in biology that distinguishes this area of concentration, and (6) concentrating on the complete collection of genes, proteins, transcripts or metabolites, not just on the study of individual entities like just piece of a DNA.

This revised concentration also covers a wide range of biomanufacturing topics, including skill sets necessary in the biomanufacturing/biotechnology workforce, which emphasizes skills like critical thinking, communication, teamwork, problem-solving. Students will be able to translate the knowledge gained through this program into various real-world situations. After completion of this program, students should possess skill sets necessary for entry-level positions in the biotechnology biomanufacturing workforce.

Upon successful completion of the program, the student will:

- Know principles and technologies for generating genomic information for biomedical and biotechnological applications;
- Know how to explore genomic data to provide novel insights throughout biology and medicine;
- Know how to develop the ability to formulate and investigate genomic research questions, methods, and results;
- Appreciate that Genomics is a dynamic and ever-changing experimental science;
- Understand and implement current manufacturing practices;
- Understand the modern biotechnology tools, which are currently being used by global researchers to ask questions in biomedical research;
- Read, discuss, and interpret the current literature related to Bioprocessing and Biomanufacturing;
- Gain hands-on experience with some of the modern biotechniques like nucleic acid manipulation, drug discovery and validation;
- Understand biopharmaceutical lab operations, such as bioreactor set-up and design, production and purification, process development, and manufacturing;
- Get familiar with industrial requirements for bioprocessing and biomanufacturing following current Good Manufacturing Practice (cGMP);
- Know sterile growing techniques following industrial standards.