Recommendation

That the Board of Regents approve an Associate in Applied Science (AAS) in Biotechnology Laboratory Technician and certificates in Basic Biotechnician and Advanced Biotechnician for Bluegrass Community and Technical College (BCTC) to be implemented in fall 2011.

Rationale

- The proposed AAS degree is consistent with the missions of KCTCS and Bluegrass Community and Technical College.
- Biotechnology has been identified as a high growth industry by the U.S. Department of Labor, with the need for biological technicians expected to grow 9 percent to 17 percent by the year 2016. Kentucky employment projections for the same period show an anticipated growth of 8 percent (*Kentucky Occupational Outlook to 2016*). Historically, the biotechnology industry has needed intellectual talent at the master’s degree and doctoral levels, but the growth of the industry coupled with the economic downturn has caused a shift in the types of workers needed to fill critical skill gaps, with many community colleges now offering curricula to train biotechnology technicians (*Careervoyages.gov*, *Bio-Link.org*).
- The 60-66 credit hour Associate in Applied Science in Biotechnology Laboratory Technician program provides the basic knowledge and laboratory skills needed to prepare for entry-level jobs in university, government, pharmaceutical, or industrial biotechnology laboratories. Graduates of the program will be able to seek employment in biotechnology laboratories, such as biomanufacturing, quality control, quality assurance, research and development, and regulatory bioscience. The program has been designed to develop skills in basic analysis of biological molecules (DNA and proteins), use of bioreactors, recombinant DNA technology, generation of cell cultures, immunological method applications, regulatory compliance (GMPs and GLPs), accurate documentation, and laboratory safety skills.
- Bluegrass Community and Technical College has the resources to implement the program. No additional funding is required.

Background

According to the *1997-2002 Kentucky Plan for Equal Opportunities in Postsecondary Education*, Bluegrass Community and Technical College has automatic eligibility.

An executive summary of the proposal is attached. A copy of the full proposal has been forwarded to each member of the Board’s Academic Affairs and Curriculum Committee.
EXECUTIVE SUMMARY

Associate in Applied Science in Biotechnology Laboratory Technician
Bluegrass Community and Technical College
A Proposal for Initiation of a New Degree Program

Mission, Influence, Organization

The proposed Associate in Applied Science in Biotechnology Laboratory Technician is consistent with System and institutional missions. The goals of the Kentucky Community and Technical College System (KCTCS) and Bluegrass Community and Technical College (BCTC) are to provide accessible, innovative, and comprehensive learning opportunities with an environment of excellence and commitment to student success in the global community. The purpose of the Biotechnology Laboratory Technician program is to prepare individuals for entry into the biotechnology industry.

Program Description

The 60-66 credit hour Associate in Applied Science Biotechnology Laboratory Technician program provides the basic knowledge and laboratory skills needed to prepare for entry-level jobs in university, government, pharmaceutical, or industrial biotechnology laboratories. Graduates of the program will be able to seek employment in biotechnology laboratories, such as biomanufacturing, quality control, quality assurance, research and development, and regulatory bioscience. The program has been designed to develop skills in basic analysis of biological molecules (DNA and proteins), use of bioreactors, recombinant DNA technology, generation of cell cultures, immunological method applications, regulatory compliance (GMPs and GLPs), accurate documentation, and laboratory safety skills. The Basic Biotechnician certificate teaches hands-on laboratory training needed for entry-level employment in a biotechnological laboratory. The Advanced Biotechnician certificate provides practical laboratory skills to supplement theoretical knowledge to improve employability in the biotechnology industry. Some courses are dual credit and college credit can be earned while students are enrolled in secondary school.

Supportive Data

Biotechnology has been identified as a high growth industry by the U.S. Department of Labor, with the need for biological technicians expected to grow 9 percent to 17 percent by the year 2016. Kentucky employment projections for the same period show an anticipated growth of 8 percent (Kentucky Occupational Outlook to 2016). Historically, the biotechnology industry has needed intellectual talent at the master’s degree and doctoral levels, but the growth of the industry coupled with the economic downturn has caused a shift in the types of workers needed to fill critical skill gaps, with many community colleges now offering curricula to train biotechnology technicians (Careervoyages.gov, Bio-Link.org).
Advancement of the biotechnology industry is critical to the economic development of the Bluegrass region, evidenced by growing biotechnology industries moving into the University of Kentucky’s (UK) Coldstream Research Campus. These include Colstream Laboratories, an FDA-approved pharmaceutical development enterprise; Allylix; BET labs; Equine Biodiagnostics; Lawrence Pharmaceutical; Lexington Pharmaceutical Laboratories; and M2 Technologies. The most well-known bioscience company, Alltech, has its international headquarters in nearby Nicholasville and has experienced rapid growth with 14 production facilities throughout the world. Martek, now part of Alltech, is the leading producer of nutraceutical fatty acids and is located in nearby Winchester. A number of these companies have contacted BCTC with needs for workforce training, with particular concerns about the lack of skilled lab technicians to support their operations.

Lexington is home to the University of Kentucky (UK), which is the area’s largest employer with nearly 10,000 jobs. Achieving a top 20 research ranking is a major goal for the university, and its many research departments produce nearly half the patents in the state (econdev.uky.edu). BCTC’s main campus is located on the grounds of UK, and the community college has a long history of transferring students into baccalaureate programs and training technicians for workforce needs.

According to James C. Greenwood, President and CEO of Biotechnology Industry Organization (BIO), “The biotech industry is hungry for skilled workers, but there are concerns that difficulties in finding such workers could impede the industry’s growth in the U.S.” (Educating Biotechnicians for Future Industry Needs; Report by the National Science Foundation and the American Association of Community Colleges, April 2008)

**Resources**

BCTC was awarded a small grant in October 2008 ($15,000; 2-year duration) in the American Association of Community College’s MentorLinks: Advancing Technological Education (ATE) program and has been paired with a mentor from Madison Area Technical College (MATC) in Wisconsin. Leveraging on the previous ATE grant, BCTC was awarded a larger ATE grant in July 2010 ($445,000; 3-year duration). The majority of the monies are earmarked for equipment. Classroom and laboratory space have been identified. Some renovation of the selected space will be necessary. BCTC will utilize current faculty members to provide instruction as the Biotechnology program “rolls out” over the next three years. A full-time temporary instructional specialist has been hired by the college to work closely with the faculty in preparing laboratories, maintaining equipment, and purchasing supplies. There are a number of existing mechanisms at BCTC to support and sustain the biotechnology program.

**Conclusion**

This proposed program is consistent with the missions of KCTCS and BCTC. There is an approved curriculum for the program. Local and state needs support the establishment of this program. Resources are available to implement the AAS in Biotechnology Laboratory Technician. The approval of this program will assist BCTC in meeting needs locally, regionally, and nationally.