TENNESSEE HIGHER EDUCATION COMMISSION

Agenda Item: III.C.

DATE: January 26, 2017

SUBJECT: New Academic Program
Middle Tennessee State University
Fermentation Science, BS

ACTION RECOMMENDED: Approval

BACKGROUND INFORMATION: In 1995, Tennessee's industry included 15 wineries, two distilleries, two major cheese-making facilities and no other fermentation facilities of any type. Today, the industry includes 60 wineries, 30 distilleries, 52 breweries, 10 cheese making operations, the largest yogurt manufacturing plant in the world (in addition to numerous smaller yogurt producers) and million gallons ethanol production facilities in two counties. Based on this rapid growth of fermentation for food and energy production, Middle Tennessee State University proposes to offer a Bachelor of Science (BS) in Fermentation Science. The proposed program will be the first in Tennessee that will prepare students for work in the commercial food production and brewing as well as the academic sector of teaching and conducting research.

The curriculum for the proposed program is multi-disciplinary and will draw primarily from the School of Agribusiness of Agriscience. The School has a long-standing relationship with Tennessee's Department of Agriculture as well as the state's food industry, particularly the food processing industry. Courses in Fermentation Science will be taught in partnership with local industry. Hands-on training sessions at industry sites as well as internships with industry will be scheduled to accommodate working professionals as well as traditional students.

PROPOSED IMPLEMENTATION DATE: Fall 2017

1.1.20A MISSION: The proposed Fermentation Science program supports Middle Tennessee State University's mission of "preparing students to thrive in their chosen professions and a changing global society." It is a direct reflection of our changing global society, especially as exhibited in the United States and Tennessee. Fermentation for food and energy production in Tennessee is growing rapidly and none of the private or public universities in Tennessee have directed attention to training Tennesseans to work in the industry. The proximity of so many fermentation facilities to Middle Tennessee State University and the potential for further growth of industries utilizing fermentation science make this proposed program a priority.

1.1.20B CURRICULUM: The proposed program will prepare students with specialized training in fermentation science who can enter the workforce ready to sustain and advance the industry. The curriculum is heavily grounded in biology, chemistry, agriscience and includes an extensive business foundation with opportunities for research and practical experience. The Fermentation Science BS program will require completion of 120 credit hours which consists of 41 credit hours in general education, 51 credit hours in the major field core, 12 hours in business courses, 6 hours in a research or internship capstone experience and 10 hours in general electives. Additionally, the program supports the Tennessee Transfer Pathways through the acceptance of 60 hour credit blocks for Associate of Science students in 18 pathways.

1.1.20C ACADEMIC STANDARDS: The admission, readmission, retention, and graduation requirements are the same as those described in the MTSU *Undergraduate Catalog*. Due to the design of the program to train industry professional in the production of fermented or distilled food and beverage products, the Tennessee Code Annotated §57-4-1 was amended in 2016 to allow students to enroll in fermentation courses where tasting an alcoholic beverage for educational purposes is required (not swallowing or consuming) upon completion of a minimum of sixty (60) credit hours of coursework.

Projected Program Enrollment and Productivity

Enrollment projections are based on the explosive growth of the fermented foods and fermentation-derived energy industries in Tennessee over the last 20 years in addition to the Master Brewers Association of the Americas 2014 Higher Education Survey results.

Year	Headcount	Graduates
2017	12	--
2018	24	--
2019	35	1
2020	49	7
2021	58	11

1.1.20D FACULTY: The instructional workload for this multi-disciplinary program will be provided by current full-time faculty in the School of Agribusiness and Agriscience and the Departments of Biology and Chemistry within the College of Basic and Applied Sciences. Additionally, faculty from the Jennings A. Jones College of Business will teach the business foundation courses.

Two additional faculty members will be hired for the proposed Fermentation Science BS program during the first two years. Both faculty members will teach and conduct research as the curriculum expands and additional courses are offered.

1.1.20E LIBRARY RESOURCES: The University has significant library holdings for the proposed Fermentation Science program. The Walker Library has a robust collection of print materials and databases on the subject of fermentation science. Additionally, advanced classes will rely heavily on manufacturers' literature for specification and performance data as well as the latest hardware and software.

1.1.20F ADMINISTRATION/ORGANIZATION: No new organizational unit will be required. The proposed Fermentation Science BS program will be housed in the School of Agribusiness and Agriscience within the College of Basic and Applied Sciences.

1.1.20G SUPPORT RESOURCES: The proposed Fermentation Science BS program will utilize the 16 college-wide advisors and trained advisors specifically for transfer students within the Student Advising Center. Faculty will also be available to advise students on curricular and career issues. Additionally, the School of Agribusiness and Agriscience advisory board will provide mentoring and experiential opportunities for the students.

1.1.20H FACILITIES AND EQUIPMENT: The School of Agribusiness and Agriscience currently has adequate classroom space and floor space for a fermentation laboratory but the fermentation laboratory will require the installation of floor drains and certain other modifications to render them acceptable for the production of food products. Specialized instructional equipment will be purchased since only limited types of fermentation are currently taught at Middle Tennessee State University. One time expenditures have been budgeted for facility renovation and equipment purchases. In year four, a technician will be hired to maintain the equipment and related technology of the program.

1.1.20I NEED AND DEMAND: The Master Brewers Association of the Americas' Higher Education 2014 Survey results indicated a significant interest and potential for employment of graduates with a degree in brewing and fermentation science. The establishment of the proposed Fermentation Science BS program provides MTSU with a unique and highly flexible employment potential opportunity in response to a rapidly growing fermentation industry in Tennessee and nationwide. Program graduates will work in a variety of positions for major manufacturers in the middle Tennessee area, such as General Mills, Kroger, Brown-Forman, and Diageo, as well as increasing number of new and growing locally owned fermented food producers, breweries, and distilleries.

1.1.20J NO UNNECESSARY DUPLICATION: The proposed program will be the only Fermentation Science program in Tennessee. Currently, there are fewer than 10 colleges and universities in the United States that offer a bachelor's program in Fermentation Science.

1.1.2OK COOPERATING INSTITUTIONS: None at this time.

1.120L DIVERSIT Y AND ACCESS: Middle Tennessee State University embraces diversity as a core value and the proposed Fermentation Science BS program is consistent with the institution's Diversity Statement with a focus on student success, faculty recruitment, curricular content, and co-curriculum programmatic events and activities. Persons of color and students from other minority groups are underrepresented in the STEM fields, as well as agriculture. The established articulation programs are anticipated to be an avenue for increased diversity and access to a bachelor's level credential.

1.1.20M ASSESSMENT/EVALUATION AND ACCREDITATION: The Fermentation Science BS program will be evaluated utilizing both formative and summative evaluations to assess the extent to which the program is meeting institutional goals and objectives. Students will have input through student evaluations and the graduating seniors examination. Hands-on experience with state of the art materials and equipment on internship settings aligning with the student's career goals will allow for evaluation of strengths and weaknesses in knowledge, skills and abilities in fermentation science by internship supervisors. These evaluations will provide not only individual student feedback by curriculum evaluation informing the continuous curricular improvement. Placement data for new graduates and alumni will be tracked to identify program strengths and existing as well as new placement efforts. Additionally, the program will be evaluated externally every seven years in accordance with the Quality Assurance Funding Program. Assessment results from both internal and external evaluations will be used for program improvements.

1.1.20O EXTERNAL JUDGEMENT: External review of the proposed program was conducted during an institution site visit on September 23, 2016. Dr. Cory Emal, Professor of Medicinal Chemistry and Fermentation Science at Eastern Michigan University, served as the external reviewer. He recommended approval of the proposed Fermentation Science BS program. Dr. Emal stated that "MTSU at multiple levels within the institution is in full support of the proposed Fermentation Science program and is prepared for its implementation. Key personnel and a program champion are in place, the administration is supportive in spirit and through the earmarking of resources, and the university itself appears to have a knack for offering and supporting unique programs that proved to be successful at attracting students. Fermentation Science is an emerging discipline, and by offering a program at its evolution, MTSU has the opportunity to become one of the leaders in the field."

1.1.20P COST/BENEFIT: The proposed Fermentation Science BS program will be funded through additional tuition revenues generated by the program. No institutional reallocation of funds is necessary for program implementation.

1.1.30 POST APPROVAL MONITORING: An annual performance review of the proposed program will be conducted for the first five years following program approval. The review will be based on benchmarks established in the approved proposal. At the end of this period, the campus, governing board, and Commission staff will perform a summative

evaluation. The benchmarks include, but are not limited to, enrollment and graduation, program cost, progress toward accreditation, and other metrics set by the institution and agreed upon by governing board and Commission staff. If benchmarks are not met during the monitoring period, the Commission may recommend that the institutional governing board terminate the program. If additional time is needed and requested by the institutional governing board, the Commission may choose to extend the monitoring period.