



TENNESSEE HIGHER EDUCATION COMMISSION

REGULAR CALENDAR ITEM: I.A.

MEETING DATE: February 7, 2025

SUBJECT: New Academic Program
Middle Tennessee State University
Biomedical Sciences, Master of Science (MS)

ITEM TYPE: Action

PROGRAM OVERVIEW

Title and Designation	Biomedical Sciences, Master of Science (MS)
Concentrations	None
Accreditation	No programmatic accreditation applicable.
CIP Code and Description	26.0102 (Biomedical Sciences, General) A general program that focuses on the integrative scientific study of biological issues related to health and medicine, or a program in one or more of the biomedical sciences that is undifferentiated as to title. Includes instruction in any of the basic medical sciences at the research level; biological science research in biomedical faculties; and general studies encompassing a variety of the biomedical disciplines.
SOC Code and Title	19-1042 (Medical Scientists, Except Epidemiologists) 19-4021 (Biological Technicians) 25-1042 (Biological Science Teachers, Postsecondary)
Credit Hours	30
Implementation Date	May 19, 2025
Modality and Delivery Site	On-ground at MTSU's Murfreesboro campus
Department/College	Departments of Biology and Chemistry, College of Basic and Applied Sciences
Governing Board Approval Date	December 4, 2024

ALIGNMENT WITH STATE MASTER PLAN AND INSTITUTIONAL MISSION/STRATEGIC PLAN

The proposed Master of Science (MS) in Biomedical Sciences at Middle Tennessee State University (MTSU) aligns with the Tennessee Higher Education Commission (THEC) State Master Plan for Higher Education by addressing the growing demand for healthcare professionals across the state. This demand is driven by significant population growth projections, with Tennessee anticipating a 12% overall increase and the greater Nashville area expecting a 25% surge. To accommodate this growth, the Tennessee Health Services and Development Agency has authorized the expansion of hospital capacity statewide. This expansion necessitates the training and recruitment of healthcare professionals and support personnel, a need that the proposed MS program aims to fulfill.

The MS in Biomedical Sciences program will be crucial in addressing the healthcare workforce shortage. It will prepare Tennessee graduates for acceptance into medical, dental, pharmacy, and other professional schools. Moreover, the program is well-suited to meet the needs of student populations who may have encountered obstacles during their early undergraduate years and faced challenges in the competitive graduate application process. The program aims to diversify and strengthen Tennessee's healthcare workforce by providing these students with advanced training and opportunities, further supporting the state's growing healthcare needs.

Finally, the proposed MS in Biomedical Sciences program aligns with MTSU's institutional master plan, particularly its commitment to advancing academic quality through excellence in teaching. Furthermore, it directly supports two of the university's key strategic directions: developing interdisciplinary degrees and encouraging innovative programs. By establishing a graduate program that fosters a broad, comprehensive knowledge base across multiple disciplines, the MS in Biomedical Sciences enhances the educational experience while preparing students for the complex challenges of the modern healthcare landscape.

PROGRAM DUPLICATION

Master's level programs in biomedical sciences are currently offered at two public universities in Tennessee. East Tennessee State University (ETSU) offers a biomedical concentration within their Biology, MS program, and the University of Tennessee, Health Science Center (UTHSC) offers a Biomedical Science, MS. In addition, biomedical science programs are offered at the following private institutions: Meharry Medical College, Lincoln Memorial University, Lipscomb University, and Vanderbilt University. The biomedical sciences programs at ETSU and UTHSC are both thesis-based programs that are designed to prepare students for advanced research careers and take at least two years. The proposed program at MTSU is a coursework-only program that will enable students to complete the program in a shorter time frame.

WORKFORCE ALIGNMENT

Data from the Tennessee Department of Labor and Workforce Development (TDLWD) indicate that through 2028, over 30,000 healthcare practitioner and technical opportunities will be available across Tennessee. The ambulatory healthcare and hospital sectors are included in the top five industries statewide, with employment in healthcare and social assistance growing 8% between 2013 and 2018. According to the TDLWD report, the occupation of medical scientist is expected to grow 22% within Tennessee between 2016-2026. Each of these career pathways will be served by the proposed program, which provides advanced training and hands-on learning in a variety of biomedical disciplines.

Employer demand for graduates of the proposed program is anticipated to be high, as the Tennessee Academic Supply and Occupational Demand Report ranks healthcare as one of the six occupation groups in high demand, and the Nashville metropolitan area is the fastest-growing metropolitan region in the state, which corresponds with a growth in healthcare needs. A Nashville health sector research report states that the city is home to more than 500 healthcare companies employing 121,027 people in direct healthcare services, with projections indicating an additional 67,000 job openings from 2018-2023 due to new positions and retirements. A search of Indeed and CareerBuilder in March 2024 demonstrated significant demand within a 100-mile radius of Murfreesboro. For example, the search yielded 116 positions in biomedical research, while there were 1,394 ads for clinical testing. Graduates of the proposed program will also be qualified for careers in pharmaceutical sales, clinical research or clinical trial coordination, medical testing, and forensic science testing. Searches for these career paths located hundreds of unfilled jobs within 50-100 miles of Murfreesboro, with high starting salaries ranging from \$50,000 to \$123,000 annually.

Beyond the growth in demand for careers serviced by the proposed degree, the demand for professional health program graduates pursuing careers such as physician assistants, physical therapists, dentists, and physicians continues to grow. An Association of American Medical Colleges Physician Workforce Profile for the state of Tennessee shows that a third of practicing physicians in the state are over the age of 60, increasing the need for new physicians soon. The proposed program is intended to expand the pool of Tennesseans eligible for admission to professional school.

CURRICULUM

The proposed MS in Biomedical Sciences will be a 30 credit, non-thesis-based program of study that will be delivered in person and designed to be completed in as little as ten months (one academic year). The proposed curriculum will include 16 credits of core courses and 14 credits of electives. All students will complete a seminar course that includes coaching and mentoring through the application and interview process for health professional programs and/or jobs. Students will have flexibility in choosing elective courses, allowing them to select from a number of biology and chemistry courses depending on their interests and future career aspirations. All but two courses are existing, and the two new courses have been developed and undergone necessary campus approvals.

The purpose of the MS in Biomedical Sciences program is to serve as a post-baccalaureate program for students interested in health professions requiring acceptance into medical, dental, pharmacy, or other professional schools. This degree will particularly benefit students who have completed their bachelor's degree but have not been accepted to a professional school, allowing students to demonstrate their ability to negotiate both the academic rigor and the course loads of professional school while building their knowledge base to excel at professional school standardized admission tests. The proposed program will provide valuable skills and experiences for students who opt to go into the workforce in positions requiring more extensive knowledge than an undergraduate degree alone.

PROJECTED ENROLLMENT AND GRADUATION

	2025-26	2026-27	2027-28	2028-29	2029-30
Enrollment	15	17	18	20	22
Graduates	9	14	14	15	16

STUDENT INTEREST AND COMMUNITY PARTNERSHIPS

MTSU conducted a survey in Spring 2022 to gauge interest in a new program among upper-division biology and chemistry students. The survey reached 339 students, with 266 indicating plans to attend a health professional school. Among the 339 respondents, 59% (200) expressed strong or moderate interest in enrolling in a specialized one-year, non-thesis master's degree program at MTSU to enhance their professional school admission qualifications. Additionally, the Integrated Postsecondary Education Data System (IPEDS) data shows that the Biomedical Sciences, MS programs doubled, and the number of degrees awarded tripled between 2011 and 2018.

Letters of support were received from both industry partners and higher education professional schools who spoke to the need and value of the proposed program, as well as an interest in hiring graduates or considering their applications for admissions. Support letters were provided by ETSU's Quillen College of Medicine, the Physician Assistant Studies Program at MTSU, the Vanderbilt University Medical Center Vaccine Center, Aegis Sciences Corporation, Life Science Tennessee, and Volunteer Botanicals, LLC.

EXTERNAL JUDGMENT

A virtual external review of the proposed program was conducted on August 31, 2024, by Dr. John Bailey, Associate Teaching Professor of Biological Sciences and Coordinator of the MS in Biomedical Sciences Program at the University of Southern Mississippi. Dr. Bailey stated that he "recommends approval of the program without hesitation." He believes the program is well-justified and needed, saying it "has the potential to help many students in the transition from their undergrad years to careers in healthcare and biomedical research." The reviewer highlighted the program's potential to enhance student preparation for medical school and other healthcare professions, as well as its ability to contribute to addressing the nationwide shortage of healthcare professionals. He noted that the curriculum is appropriately extensive and sophisticated, and that the admission standards, degree requirements, and faculty quality are adequate.

PROGRAM COSTS AND REVENUES

The proposed expenditures for the MS in Biomedical Sciences are listed in Table 1 below. Start-up costs are minimal, and most expenditures are for instruction costs related to teaching and program coordination. An existing staff member will devote half-time effort to the program to assist with administrative tasks, marketing, and travel funds are allocated to assist with recruiting materials and visits.

Table 1: Estimated Costs to Deliver the Proposed Program

<i>Estimated Costs to Deliver the Proposed Program</i>						
One-Time Expenditures						
Category	Planning	Year 1	Year 2	Year 3	Year 4	Year 5
Faculty & Instructional Staff						
Non-Instructional Staff						
Graduate Assistants						
Accreditation						
Consultants	\$4,000					
Equipment						
Information Tech						
Library						
Marketing	\$2,000					
Facilities						
Travel						
Other						
<i>Total One-Time Expenditures</i>	<i>\$6,000</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>
Recurring Expenditures						
Category	Planning	Year 1	Year 2	Year 3	Year 4	Year 5
Faculty & Instructional Staff	\$0	\$40,200	\$40,200	\$40,200	\$40,200	\$40,200
Non-Instructional Staff	\$40,000	\$41,200	\$42,436	\$43,709	\$45,020	\$46,380
Graduate Assistants						
Accreditation						
Consultants						
Equipment						
Information Tech						
Library						
Marketing		\$500	\$500	\$500	\$500	\$500
Facilities						
Travel		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000

Other*:		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
<i>Total Recurring Expenditures</i>	<i>\$40,000</i>	<i>\$85,900</i>	<i>\$87,136</i>	<i>\$88,409</i>	<i>\$89,720</i>	<i>\$91,080</i>
Grand Total (One-Time and Recurring)	\$46,000	\$85,900	\$87,136	\$88,409	\$89,720	\$91,080
Projected Revenues						
Category	Planning	Year 1	Year 2	Year 3	Year 4	Year 5
Tuition		\$192,720	\$218,416	\$231,264	\$256,960	\$282,656
Grants						
Other						
Total Revenues	\$0	\$192,720	\$218,416	\$231,264	\$256,960	\$282,656

*Costs for "Other" will be used for miscellaneous expenses associated with operating the proposed program, such as office supplies and postage.