

**DATE:** July 23, 2020

**SUBJECT:** New Academic Program  
Tennessee State University  
Environmental Science, Master of Science  
(CIP 03.0104 – Environmental Science)

**ACTION RECOMMENDED:** Approval

**PROGRAM DESCRIPTION**

Tennessee State University (TSU) proposes an Environmental Science, Master of Science (MS) that would provide a diverse pipeline of environmental scientists to the workforce and would support the three-pronged mission of TSU’s College of Agriculture: Education, Extension, and Research.

Since 2010, the Department of Agricultural and Environmental Sciences at TSU has been building research capacity in environmental science with direct application to agriculture. Currently, research is being carried out in bioenergy, forestry, geospatial sciences, climate change, wildlife biology, soil chemistry, plant sciences, natural resources, environmental remediation and related areas. Faculty researchers at TSU have been working with graduate and undergraduate students, industry and government, and rural and urban communities and the feedback from these stakeholders has led to the initiation of the proposed Environmental Science, MS program.

The proposed Environmental Science, MS program will require 30 – 35 graduate credit hours and will offer concentrations in Natural Resources, Plant Sciences, and Geospatial Sciences. TSU’s existing Environmental Science concentration within the Bachelor of Science in Agricultural Sciences program will serve as a pipeline for the proposed program. Additionally, the target audience will include graduates from related four-year programs and will consist of primarily on-ground courses.

Graduates of the proposed program will be prepared for a variety of employment opportunities such as environmental scientists, zoologists, wildlife biologists, foresters, conservation scientists, plant scientists, and soil scientists as well as entrance into related PhD programs. Furthermore, due to the anticipated diversity of graduates from the program, the proposed program will aid in filling a national gap in the representation of diverse applicants for environmental science related jobs.

Tennessee State University provided an update regarding the impact of the Coronavirus pandemic on the proposed Environmental Science, MS program (Appendix A). Several changes have been made to the proposed program based on the ongoing pandemic such as waiving GRE requirements for the first semester and

adjusting enrollment projections for the fall semester due to anticipated lower enrollments for the initial year of implementation.

### **INSTITUTIONAL GOVERNING BOARD APPROVAL**

The proposed Environmental Science, MS program was approved by the Tennessee State University Board of Trustees on June 18, 2020.

### **PROPOSED IMPLEMENTATION DATE**

Fall 2020

### **RELEVANCE TO INSTITUTIONAL MISSION AND STRATEGIC PLAN**

The proposed program supports TSU's mission to foster scholarly inquiry and research, lifelong learning, and a commitment to service by providing a new academic area for student development which involves applied research, practical coursework, and thesis-based inquiry focused on environmental issues.

Additionally, the proposed program aligns with the 2015-2025 Master Plan for Tennessee Postsecondary Education in several areas including increasing educational attainment; addressing economic development, workforce development, and research needs; increasing degree production; and using institutional mission to differentiate program offerings.

### **CURRICULUM**

The proposed Environmental Science, MS program requires the completion of 30 – 35 credit hours and will offer both a thesis and non-thesis option. Graduates from the proposed program will be able to:

- Use their knowledge of advanced principles of environmental science and the relationship between environmental science and agriculture;
- Collect and analyze environmental/agricultural samples from the laboratory and field settings;
- Interpret and evaluate data to identify and implement solutions for environmental issues in government, education, industry, and society in general; and
- Communicate information related to environmental issues to diverse groups and work with multi-disciplinary teams.

A curriculum committee will meet annually to review course offerings and evaluate enrollment trends, market demands, and student evaluations.

### **PROGRAM PRODUCTIVITY**

The proposed Environmental Science, MS program projects an initial enrollment of 14 students with steady increases to 27 students by the fifth year. The majority of students will be eligible for tuition support funded through either research funds or faculty research projects.

	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Enrollment</b>	14	25	26	26	27
<b>Graduates</b>	--	10	12	12	13

## **PROGRAM DUPLICATION**

University of Tennessee, Chattanooga (UTC) is the only other public university to offer a Master of Science in Environmental Science. However, the proposed program at TSU provides differentiation from the UTC program due to the proposed concentrations in plant sciences, geospatial sciences, and natural resources.

## **EXTERNAL JUDGEMENT**

An external review of the proposed program was conducted during an institutional site visit on February 6, 2020. Dr. Kirk Pomper, Interim Dean of the College of Agriculture, Communities, and the Environment and Director of Land Grant Programs at Kentucky State University served as the external reviewer. The site visit included meetings with campus administrators, faculty, prospective students and community partners.

Dr. Pomper made a recommendation for approval of the proposed program and stated “I strongly recommend this program move forward for consideration in the approval process based on the well-qualified faculty, excellent facilities, and demonstrated stakeholder interaction, which will positively impact the quality of life in Tennessee.”

## **STUDENT DEMAND**

The College of Agriculture at TSU conducted an online survey of current graduate students and 80 percent indicated they would prefer an Environmental Science degree over an Agricultural Sciences degree. Additionally, a survey was administered to Biology undergraduate students enrolled at Middle Tennessee State University and Belmont University and 87 percent of respondents indicated a preference for a degree in Environmental Science. When survey respondents were asked about program proximity, 89 percent preferred a program near their current location.

## **OPPORTUNITIES FOR PROGRAM GRADUATES**

The Tennessee Department of Labor and Workforce Development anticipates an increase in employment for environmental scientists from 14.5 percent to 16.5 percent between 2016 – 2026. Additionally, the Bureau of Labor Statistics estimates employment of environmental scientists and specialists is expected to increase by 11 percent from 2016 – 2026, which is faster than the national average of seven percent.

The need for the proposed Environmental Science, MS program is corroborated by letters of support from federal, state, and industry partners such as the US Department of Agriculture, US Department of the Interior, US Environmental Protection Agency, Oak Ridge National Laboratory, TN Wildlife Resources Agency, TN Department of Agriculture, Cumberland River Compact, and Environmental Adaptive Strategies, LLC.

## **INSTITUTIONAL CAPACITY TO DELIVER THE PROGRAM**

The proposed program will draw primarily from existing resources including 24 current full-time equivalent (FTE) faculty and several staff positions dedicated to environmental science

in the College of Agriculture at TSU. One additional faculty line will be required to deliver the coursework and the program will draw primarily on existing courses. Currently, funds from the State of Tennessee, United States Department of Agriculture, and other federal departments and agencies are supporting a multi-million-dollar research program in environmental science which includes supporting 20 graduate research assistantships for the proposed program. Appendix B outlines the five-year financial projections for the proposed Environmental Science, MS program.

#### **ASSESSMENT AND 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, institutional 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 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.

Tennessee Higher Education Commission  
Coronavirus Impact on New Academic Programs



June 26, 2020

In light of the current Coronavirus pandemic, THEC is requesting additional information for new academic programs that are slated for the July 23, 2020 Commission meeting agenda. Please submit your response to the questions listed below by July 10, 2020. Any changes to expenditures and/or revenues will require a revised THEC Financial Projections Form.

**Institution:** Tennessee State University

**Academic Program, Degree Designation:** Environmental Science, Master of Science

**Proposed Implementation Date:** Fall 2020

**Questions: Coronavirus Impact on New Academic Programs**

**Overall Program Need**

- Is this academic program as relevant as before the pandemic?  
*-Yes, this academic program is just as relevant as before the pandemic. It's actually more relevant now because there is a close relationship between the environmental management and pandemics.*
- Does this remain the most needed utilization of institutional resources in light of the pandemic?  
*-Yes, this new program remains the most needed utilization of institutional resources. In fact, the program adds new resources to the university.*

**Implementation Date, Admissions, and Enrollment**

- Any projected change in the proposed implementation date for the program?  
*-No, there are no changes in implementation date.*
- Will there be any adjustments needed in admission standards?  
*-Yes, the requirement for GRE or MAT will be waived for the Fall 2020 semester because of COVID-19. All other admission requirements will be maintained.*
- Have enrollment projections shifted for the proposed program? If so, please provide an updated enrollment and graduation table and include an updated financial projections form.  
*-The first year enrollment was dropped from the previous estimate of 16 students to the current 14 students because of the COVID-19 challenges which might slightly affect recruitment efforts, and also the late approval of the degree program. However, the long-term projected enrollment will be maintained at a minimum of 25 students every year. These adjustments have already been incorporated in the final revision of the proposal.*

**Program Delivery**

- What is the current delivery mode of the proposed academic program?  
*-The MS in Environmental Sciences degree program is a thesis-based graduate program requiring sophisticated equipment, laboratories, and other experimental facilities for research and laboratories along with experienced mentors/advisors. Hence, the mode of delivery remains on-ground.*
- Are there plans to change the delivery mode for this program in light of the pandemic?  
*-Yes, there will be temporary accommodations for hybrid course delivery and also the number of Students per on-ground classes will be reduced to ensure distancing as per CDC guidelines. Class meeting times will be split between on ground and online delivery. Schedules will be developed to stagger students' presence and regulate their numbers in the research laboratories.*
- What percentage of the curriculum is devoted to online delivery?  
*-None of the courses will be delivered entirely online. However, some courses will use the hybrid delivery model, online lectures and on ground discussions and laboratory work.*

**Staffing and Placements**

- What faculty and staff searches are planned prior to implementing the proposed program?  
*-There are no faculty and staff searches planned prior to program implementation.*  
Are any faculty and staff searches currently being advertised? If so, what is the anticipated hire date for these positions? Any challenges in hiring for these positions?  
*-there is an ongoing search for an Assistant Professor position in Silviculture and Forest Management with the intention of filling the position by August 15, 2020. There are no challenges in hiring for this position.*
- If applicable, are there any special considerations that will need to be made for student placements in clinical and/or internship settings?  
*-No, the degree program will not have clinical or internship placements.*

**Accreditation**

- Are there any accreditation considerations in light of the pandemic for the proposed program?  
*-No, there are no accreditation considerations in light of the pandemic.*

**Fiscal**

- If applicable, are there any renovation and/or equipment purchases that have been affected by the pandemic?  
*-No, there are no renovation and/or equipment that have been affected.*
- How equipped is the proposed program to endure any significant institutional budget cuts?  
*-The program will be supported by 35 state-of-the art and fully equipped research laboratories on the main campus of Tennessee State University and in three research stations, strategically situated across the Middle Tennessee with their own indoor and outdoor research facilities. The research infrastructure is supported by both Federal and State funding and will not be affected by any significant institutional budget cuts.*

**Other**

- Are there any additional changes/considerations for the proposed academic program due to the pandemic? **No**

**Tennessee Higher Education Commission**  
**Appendix B: THEC Financial Projections**  
**Tennessee State University**  
**M.S. Environmental Science**

Seven-year projections are required for doctoral programs.  
Five-year projections are required for baccalaureate and Master's degree programs  
Three-year projections are required for associate degrees and undergraduate certificates.  
Projections should include cost of living increases per year.  
Planning year projections are not required but should be included when appropriate.

	Planning Year	Year 1	Year 2	Year 3	Year 4	Year 5
<b>I. Expenditures</b>						
<b>A. One-time Expenditures</b>						
New/Renovated Space <sup>1</sup>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Equipment	-	-	-	-	-	-
Library	-	-	-	-	-	-
Consultants	-	-	-	-	-	-
Travel	-	-	-	-	-	-
Other	-	-	-	-	-	-
<b>Sub-Total One-time</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>B. Recurring Expenditures</b>						
<b>Personnel</b>						
<b>Administration</b>						
Salary	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Benefits	-	-	-	-	-	-
<b>Sub-Total Administration</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Faculty (New)</b>						
Salary	\$ -	\$ 51,000	\$ 52,020	\$ 53,060	\$ 54,122	\$ 55,204
Benefits	-	\$ 17,850	\$ 18,207	\$ 18,571	\$ 18,943	\$ 19,321
<b>Sub-Total Faculty</b>	\$ -	\$ 68,850	\$ 70,227	\$ 71,632	\$ 73,064	\$ 74,525
<b>Support Staff</b>						
Salary	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Benefits	-	-	-	-	-	-
<b>Sub-Total Support Staff</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Graduate Assistants</b>						
Salary	\$ -	\$ 155,077	\$ 281,880	\$ 277,392	\$ 284,175	\$ 279,325
Benefits	-	-	-	-	-	-
Tuition and Fees* (See Below)		125,723	236,520	241,008	255,825	260,675
<b>Sub-Total Graduate Assistants</b>	\$ -	\$ 280,800	\$ 518,400	\$ 518,400	\$ 540,000	\$ 540,000
<b>Operating</b>						
Travel	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Printing	-	-	-	-	-	-
Equipment	-	-	-	-	-	-
Other	-	-	-	-	-	-
<b>Sub-Total Operating</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Recurring</b>	\$ -	\$ 349,650	\$ 588,627	\$ 590,032	\$ 613,064	\$ 614,525
<b>TOTAL EXPENDITURES (A + B)</b>	\$ -	\$ 349,650	\$ 588,627	\$ 590,032	\$ 613,064	\$ 614,525

<b>*If tuition and fees for Graduate Assistants are included, please provide the following information.</b>						
Base Tuition and Fees Rate		\$ 9,671	\$ 9,855	\$ 10,042	\$ 10,233	\$ 10,427
Number of Graduate Assistants		13	24	24	25	25
	<b>Planning Year</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
<b>II. Revenue</b>						
Tuition and Fees <sup>2</sup>	-	136,152	247,147	262,665	266,859	283,163
Institutional Reallocations <sup>3</sup>	-	(67,302)	(176,920)	(191,033)	(193,795)	(208,638)
Federal Grants <sup>4</sup>	-	280,800	518,400	518,400	540,000	540,000
Private Grants or Gifts <sup>5</sup>	-	-	-	-	-	-
Other <sup>6</sup>	-	-	-	-	-	-
<b>BALANCED BUDGET LINE</b>	<b>\$ -</b>	<b>\$ 349,650</b>	<b>\$ 588,627</b>	<b>\$ 590,032</b>	<b>\$ 613,064</b>	<b>\$ 614,525</b>
<b>Notes:</b>						
<b>(1) Provide the funding source(s) for the new or renovated space.</b>						
N/A						
<b>(2) In what year is tuition and fee revenue expected to be generated? Tuition and fees include maintenance fees, out-of-state tuition, and any applicable earmarked fees for the program. Explain any differential fees.</b>						
Year (Enrollment)	Instate fees	Out of state	Instate	Out of state	Total Fee	
1 (14)	\$9,671	\$20,857	13(125,723)	1(10,429)*	\$ 136,152	
2 (25)	\$9,855	\$21,253	24(236,520)	1(10,627)*	\$ 247,147	
3 (26)	\$10,042	\$21,657	24(241,008)	2(21,657)**	\$ 262,665	
4 (26)	\$10,233	\$22,067	25(255,825)	1(11,034)*	\$ 266,859	
5 (27)	\$10,427	\$22,488	25(260,675)	2(22,488)**	\$ 283,163	
*Tuition for one part-time out- of state student registered for 6 credit hours (half-load) per semester.						
**Tuition for two part-time out of state students registered for 6 credit hours (half-load) per semester.						
<b>(4) Provide the source(s) of the Federal Grant including the granting department and CFDA(Catalog of Federal Domestic Assistance) number.</b>						
The United States Department of Agriculture (USDA) Capacity Funds-Evans Allen and Cooperative Extension						
will support 20 graduate Research Assistanships (GRAs) annually beginning with 13 GRAs in year 1. Additional 4-5 GRAs will be supported by faculty grants annually. Beginning year one, 1-2 part-time graduate student will be self-supporting at out of state tuition rate.						
The program will yield 10-13 graduates annually beginning at the end of year 2.						
<b>(5) Provide the name of the organization(s) or individual(s) providing grant(s) or gift(s).</b>						
USDA-National Institute of Food and Agriculture						
<b>(6) Provide information regarding other sources of the funding.</b>						
N/A						