ROBERT M. SMITH
INTERIM EXECUTIVE DIRECTOR

BILL LEE
GOVERNOR

STATE OF TENNESSEE
HIGHER EDUCATION COMMISSION
STUDENT ASSISTANCE CORPORATION
312 ROSA L. PARKS AVENUE, 9TH FLOOR
NASHVILLE, TENNESSEE 37243
(615) 741-3605

TO: Bernie Savarese, Acting Vice President of Academic Affairs and Student Success
University of Tennessee System

FROM: Julie A. Roberts, Chief Academic Officer
Tennessee Higher Education Commission

Digitally signed by Julie A. Roberts
Date: 2023.09.06 17:21:26 -05'00'

SUBJECT: University of Tennessee, Knoxville
Letter of Notification: Bachelor of Science in Applied Artificial Intelligence, BSAAI

DATE: September 6, 2023

Thank you for the submission of the Letter of Notification (LON) for the Applied Artificial Intelligence, Bachelor of Science (BSAAI) program. Per THEC Policy A1.0 New Academic Programs: Approval Process, the LON is evaluated on the following criteria: alignment with state master plan and institutional mission; feasibility; institutional capacity to deliver the proposed academic program; and program costs and revenues.

After reviewing the revised LON, I approve University of Tennessee, Knoxville's (UTK) plan to develop the New Academic Program Proposal (NAPP) for the Applied Artificial Intelligence, Bachelor of Science (BSAAI). As UTK continues to develop the proposed program, all concerns italicized in the attached LON evaluation must be reflected in the NAPP. It is understood the proposed program will be developed in accordance with the mission of UTK and will meet the Master Plan for Tennessee Postsecondary Education 2015-2025 degree completion and workforce development objectives.

Attachment

cc: Randy Boyd, UT System, President
Robert M. Smith, THEC, Executive Director
Donde Plowman, UTK, Chancellor
John Zomchick, UTK, Provost
Karen Etzkorn, UT System, Director of Academic Affairs
Xiaopeng Zhao, UTK, Program Director, College of Emerging and Collaborative Studies
Ryan Korstange, THEC, Director of Academic Affairs

Tennessee Higher Education Commission
Letter of Notification Evaluation
September 6, 2023

The evaluation of the Letter of Notification (LON) is in accordance with the THEC Policy A1.0 New Academic Programs: Approval Process. The evaluation is conducted by interested parties and THEC staff. The LON is posted on the THEC website for a 15-day period of comment by interested parties. Based on the internal and external evaluation, THEC will make a determination to support, not to support, or defer a decision based on a revised LON.

Institution: University of Tennessee, Knoxville	**LON Submission Date:** August 7, 2023
Academic Program, Degree Designation: Applied Artificial Intelligence, BSAAI **Concentration(s):** N/A	
Proposed CIP Code and Title: 11.0102	
Proposed Implementation Date: August 2024	
Time Period Posted on Website for Public Comment: August 8, 2023 – August 22, 2023	
Academic Program Liaison(s): Karen Etzkorn, Director of Academic Affairs University of Tennessee System Phone number: 865-974-2140 Email: etzkorn@tennessee.edu Xiaopeng Zhao, Program Director College of Emerging and Collaborative Studies University of Tennessee, Knoxville Phone number: 865-974-7682 Email: xzhao9@utk.edu	

Note: Comments in italics within this document should be addressed in the NAPP.

Letter of support from President/Chancellor	▪ A signed letter of support written by Bernie Savarese, dated August 3, 2023 was included in the proposal. ▪ A campus letter of support was received from John Zomchick, Provost and Senior Vice Chancellor, on July 29, 2023.
Section II: Background	
Background on academic program development	▪ Several industry reports from 2023 point to significant growth in Artificial Intelligence (AI) prompted the College of Emerging and Collaborative Studies (CECS) at the University of Tennessee, Knoxville (UTK) to propose an Applied Artificial Intelligence (AAI) program that would meet the projected demand for skilled professionals in this emerging area. ▪ Reports include:

	○ the Organization for Economic Cooperation and Development (OECD) Employment Outlook, ○ the World Economic Forum Future of Jobs Report, ○ LinkedIn's AI in the IT Job Market report, ○ Indeed & Glassdoor's Hiring and Workplace Trends Report, ▪ The World Economic Forum's Future of Jobs Report indicated that 75 percent of the surveyed companies would adopt some form of AI in the next five years. ▪ LinkedIn's AI in the IT job market report noted a possible increase of efficiency with the automation of repetitive tasks. It also noted a potential risk of upskilling and reskilling to keep pace with changing technology. ▪ Indeed & Glassdoor's key trends in the job market report indicated AI related jobs had a 20 percent increase in May 2023. ▪ The US Department of Education AI report shows an increase in employing AI in education and indicating its potential to revolutionize education through enhanced learning, teaching, assessment, research, and development. ▪ Indeed & Glassdoor's 2023 Hiring and Workplace Trends Report indicated a 20 percent surge in AI jobs across the United States in May of this year. This surge is also reflected in Tennessee, The Bureau of Labor Statistics projects a growth rate of 3.3 percent for positions such as computer and information research scientists, including AI specialists, in Tennessee for 2022.
Purpose and nature of academic program	▪ The proposed program is designed to provide training in foundational AI concepts, data sources, and tools across multiple disciplines. The program will also provide instruction in methods and components of AI solutions. This training will be less technical and more streamlined than a computer science degree. ▪ The proposed AAI program will be 120 credit hours and will be delivered in a hybrid format. ▪ The target audience of the proposed program includes students interested in a career in AI and students who are still determining their ideal career path. ▪ The proposed program will also attract community college students that want to elevate their academic and professional portfolios with a degree from a r-year institution. ▪ The proposed program will exist within a rich, collaborative environment, allowing students to delve into various applications of AI and related technologies across diverse fields such as design, music, social sciences, natural sciences, business, and communications. The goal is to produce graduates with a blend of technical prowess and interdisciplinary acumen who are well equipped to influence the emerging workplace applications of AI.

	▪ Program outcomes listed in the LON depict a student that will have the skills to navigate and excel in the AI landscape. Specific outcomes are listed on page 11 of the LON.
Alignment with State Master Plan and Institutional Mission	▪ The proposed program aligns with market needs outlined in the State Master Plan Update by responding to a growth in AI-related jobs and the need to "interact with artificial intelligence using critical thinking, data analysis, and diverse communication skills rather than simply rely on artificial intelligence to complete a variety of tasks" (p. 35). ▪ This program also aligns with a strategic mission from the THEC State Master Plan. to develop graduates who are technically skilled, ethically aware, and socially responsible by providing interdisciplinary instruction, emphasizing technical skills and broader competencies, and offering a foundational understanding of AI. Taken together, this program fulfills THEC's aim of supporting workforce development. ▪ The proposed program aligns with UTK's mission profile by providing forward-looking and innovative academic offerings, reflecting the institutions commitment to stay at the forefront of technology and innovation. ▪ The proposed program is structured around hands-on and real-world experiences, which will further UTK's strategic partnerships and innovative research. ▪ Further, given the high demand for AI professionals, many graduates will remain in Tennessee after graduation, fulfilling UTK's mission to give back to the state through its alumni.
Institutional capacity to deliver the proposed academic program	▪ The program is supported by the CECS at multiple levels: o The Program Directors and Program Coordinators will oversee the curriculum and enrollment, course scheduling, assessment, accreditation, capstone, and research course contents. o The CECS Director of Marketing will oversee advertising, outreach, and prospective student recruitment. o The CECS Director of Advising will oversee the advising of all CECS majors in their degree program operations. o The Director of Partnerships and Economic Development will also engage campus, community, and industry partners to support experiential learning in the program, fostering pathways to student employment.
Existing programs offered at public and private Tennessee institutions	▪ No universities utilize CIP code 11.0102 in Tennessee. However, several universities offer undergraduate degrees in computer science or data science with a concentration in AI (CIP code 11.0701). ***Please provide more information about each of these programs, including the name of the degree and concentration, and the number of degrees awarded for the last three years.*** o Middle Tennessee State University

	○ East Tennessee State University ○ Tennessee State University ○ Tennessee Technological University ○ University of Memphis ○ Vanderbilt University ○ Belmont University ○ Lee University ○ Christian Brothers University ○ Rhodes College ▪ UTK offers a certificate in Artificial Intelligence and Machine Learning with approximately 10 degrees awarded over the past three years.
Accreditation	▪ The proposed program will obtain Data Science Council of America (DASCA) accreditation to initiate accreditation with the Artificial Intelligence Board of America (ARTIBA). Appendix B (pg. 40) of the LON has a timeline for this accreditation. ▪ The program will require a substantive change request be submitted to SACSCOC.
Administrative Structure	▪ The AAI major will be housed in the College of Emerging and Collaborative Studies at the University of Tennessee, Knoxville. The organizational chart is presented on page 17 of the LON.
Section III: Feasibility Study	
Student interest	▪ UTK distributed an online survey to 3,716 undergraduates in the Tickle College of Engineering with 526 respondents. approximately 34 percent (178 respondents) indicated that they would have been extremely interested in the proposed program, had it been available when they selected their major. ▪ Additionally, 41 percent of respondents (213 students), expressed extreme interest in pursuing a human-robot interaction concentration or major. ▪ Finally, 26 percent of the respondents (132 students) indicated that they would have selected a concentration or major in AI for cybersecurity.
Local and Regional Demand	▪ An analysis by Lightcast projects the regional (Tennessee and neighboring states) trends for target occupations from the proposed degree to increase by 16 percent in the region from 2022-2027. This equates to an increase of approximately 55,000 jobs. ***Please provide additional information on local demand for the proposed program.***
Employer Demand	▪ According to an analysis conducted by Lightcast for UTK, there were 201,513 total job postings for employees with skills trained in this program were listed from July 2022 to June 2023 in the Southeast Region, of which 124,375 were unique. ▪ The Lightcast analysis also showed 106,382 total job postings for AI positions in the region from July 2022 to June 2023.

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- Lightcast also predicted that the need for graduates with human-centered design skills would increase at a much higher rate than, projected at more than 20 percent for this region and more than 17 percent for the nation.

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<tr><td>Community and Industry Partnerships</td><td>

- Letters of industry support indicate a willingness to provide internships, sponsor capstone projects, and hire graduates. Letters were received from multiple organizations including:
  - Reelay
  - Eonix Energy
  - RobotLAB
  - NellOne
  - Philips
  - Atmosera
- The proposed program would also strengthen ties with industry partners like Oak Ridge National Laboratory and is in contact with other companies for additional letters of support including:
  - Tenhats
  - iO Urology
  - Amazon
  - Endeavor

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<tr><td colspan="2">Section IV: Enrollment and Graduation Projections</td></tr>
<tr><td>Projected Enrollment and Graduates</td><td>

Year	Academic Year	Projected Total Fall Enrollment	Projected Attrition	Projected Graduates
1	2024-2025	15	2	--
2	2025-2026	25	3	--
3	2026-2027	35	4	--
4	2027-2028	40	4	10
5	2028-2029	50	5	17

- The proposed program anticipates students to enroll in 15 credit hours per semester and complete in four years.
- Enrollment figures are calculated by using UTK's 90 percent first-year retention rate.

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<tr><td colspan="2">Section V: Projected Costs to Deliver Proposed Program</td></tr>
<tr><td>Faculty</td><td>

- One new lecturer will be hired to teach program courses, at a cost of $118,800 (salary + benefits) starting in year one. ***The faculty and instructional costs described in the LON do not match those in the financial projections form, please reconcile.***

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<tr><td>Non-Instructional Staff</td><td>

- Hourly undergraduate graders will be hired to complete 66 hours of grading at $20/hour. One grader will be hired in year 1, increasing to four in year 4. ***The cost description does not match that in the financial projections form, please reconcile or provide additional explanation of the costs reported in the financial projections form.***

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<tr><td>Graduate Assistants</td><td>

- No graduate assistants indicated at this time.

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Accreditation	▪ Estimated accreditation costs for DSCA is $21,900 and ARTIBA Is $15,900. These costs are incurred in program years 4-5.
Consultants	▪ A one-time external reviewer cost of $1500.
Equipment	▪ No additional costs associated with equipment needed for this program.
Information Technology	▪ No additional costs associated with information technology are needed for this program.
Library Resources	▪ No additional costs associated with library resources are needed for this program.
Marketing	▪ Marketing expenses will amount to $500 per year
Facilities	▪ No additional costs are anticipated for facilities.
Travel	▪ No travel expenses are specifically associated with this program.
Other Resources	▪ No additional resources will be needed to support the program.
Section VI: Projected Revenues for the Proposed Program	
Tuition	▪ The program expects to generate $47,682 in tuition revenue in year 1, increasing to $467,282 in year 5. Revenue is calculated as $378 per SCH for Tennessee residents and $759 per SCH for non-residents. The program is anticipating that 20 percent of enrolled students have non-resident status.
Grants	▪ N/A
Other	▪ N/A
Appendices	
Letters of Support	▪ Letters of support were received and attached in Appendix A of the LON from: o Bill Malkes, CEO, NellOne Therapeutics Inc. o Don DeRosa, CEO, Eonix o Deric Frost, CEO & Founder, Reelay Meetings, Inc. o Soheil Borhami, Scientist, Philips Research o Jeffrey Prosise, Chief Artificial Intelligence Officer, Atmosera o Cedric Vaudel, Vice President of Sales at RobotLAB Group
THEC Financial Projections Form	▪ Financial projections provided in Appendix C.
Public Comment	
Public Comments Received	▪ ***Public comments have been submitted by University of Memphis and attached as appendices. Please respond to any concerns in these documents.***

From: Ladrica Menson-Furr (lmnsnfrr) <lmnsnfrr@memphis.edu>
Sent: Wednesday, August 9, 2023 4:12 PM
To: Carol Danehower (vdanehwr) <vdanehwr@memphis.edu>
Cc: Deborah Perron Tollefsen (dtollfsn) <dtollfsn@memphis.edu>; David J Russomanno (drussmnn) <drussmnn@memphis.edu>; Abby L Parrill-Baker (aparrill) <aparrill@memphis.edu>
Subject: Re: Public Comment - UTK Applied Artificial Intelligence, BSAAI and Innovative Transdisciplinary Studies (BS-ITS)

Good afternoon, Provost Russomanno, Dr. Danehower, and Dr. Tollefsen,

I have included Dr. Wang's comments on the proposal below. Please see the updated, copied information.

Kind regards,
L. Menson-Furr

Vasile Rus

- There are some critical aspects about the program that are missing in the LON in order to understand what the program is about. What is the core of the new program? What exactly are the core courses (27 credits CECS core)? Course titles and short descriptions are needed. Is the structure of this program something like 'core + certificate(s)'? If so, aren't the certificates more like concentrations in a standard program? Once the core is specified it will be more clear what the new degree is about.
- Furthermore, it is not clear whether students getting this degree will have to declare the new degree as their major or not, i.e., will this be an additional major students from any other major can declare and pursue (double major)? The LON states 'For example, students from any major can choose a certificate in Artificial Intelligence offered by CECS.' Will the other major allow them to do that within the typical 120-hour program requirement?
- Figure 1 is supposed to help but it is not clear. Is it the proposed program the one shown in the middle in Figure 1 or the one on the right hand side of that figure? The one in the middle actually indicates more than 120 credit hours needed (96 + 27 + CECS Program Plan) which is confusing or it may just be an error.
- while the stated goal of 'CECS aims to reduce the redundancy of delivery of topics such as data science and artificial intelligence' seems appealing from a university efficiency perspective, there is the problem of 'one-size fits all' instructional strategy which leads to much less effective instruction. If students from all majors are taking the same course (which seems to be implied by the redundancy elimination argument) and the requirements of the course are the same for everyone, students from social sciences will systematically do worse than the engineering or math admitted students. That is, redundancy or offering same course to different audiences has its purpose which is to

tailor instruction to students as much as it may be possible in a classroom/one-to-many environment. Indeed, redundant delivery of certain topics is justified by the fact that, for instance, an AI course for social sciences students should be taught differently from an AI course taught to engineers or math students.

- the LON should address in more depth and provide convincing arguments with respect to how students from various backgrounds/colleges/majors will be taking courses to meet the requirements of a stackable certificate, say, in Data Science or Artificial Intelligence. For instance, a student in engineering versus a student in social sciences will have very different backgrounds with respect to foundational skills required for doing well in the Data Science or Artificial Intelligence certificate. How will the new program address this challenge? Will this be addressed at admissions and how exactly? Or later and how exactly?
- details about admissions to this new program are critical and must be specified.
- cost estimates must be further detailed, e.g., with respect to new course development, director compensation, fellows compensation, etc.

Lan Wang

it's unclear how the number of courses offered and number of students in each class match their enrollment projection. More specifically, the proposal says "Five gateway courses taught in years 1 and 2, six in year 3, seven in year 4, and eight in year 5. Each course is assumed to have five students in year 1, incremented by one additional student per class up to nine students per class in year 5". But the projection has 50 students enrolled in the fifth year. So the question is why there are only up to nine students per class in year 5 for eight classes.

- it's unclear exactly how many lecturers and other instructional staff will be needed. The proposals says "Lecturers needed based on a 4/4 teaching load", eight courses will be offered in year 5, so it appears that one lecturer will be sufficient. And the salary will be $90,000 annually for the lecturers. However, the budget for Faculty & Instructional Staff in year 5 is $237,300. The proposal needs to explain exactly how many lecturers and other instructional staff will be needed each year and how the budget is calculated.

Ladrica Menson-Furr, Ph.D.
Assistant Dean, College of Arts and Sciences
Director, African and African American Studies Program
Associate Professor of African American Literature

The University of Memphis
106 Scates Hall
Memphis, TN 38152
(901) 678-1332