Expedited Letter of Notification (ELON)

Policy A1.6 Expedited Academic Programs: Approval Process

Institution:	East Tennessee State University
Proposed Academic Program:	Mechatronics Engineering, BS
Proposed Implementation Date:	Fall 2023
Proposed CIP Code:	14.4201
Proposed CIP Code Title:	Mechatronics, Robotics, and Automation Engineering.
LON Submission Date:	November 21, 2022
Posted on the THEC Website:	November 21, 2022
Public Comment Period:	November 21, 2022 – December 2, 2022

Expedited Letter of Notification Checklist

THEC Academic Policy A1.6 (Section 1.6.4A) Expedited Letter of Notification (ELON) Requirements:

- ✓ Letter of Support from the President/Chancellor signifying institutional governing board or system office support for development;
- ✓ Institution name, proposed academic program, degree designation, proposed CIP code, and CIP code title;
- ✓ Academic Program Liaison (APL) name and contact information;
- ✓ Implementation timeline;
- ✓ Background narrative;
- ✓ Justification for consideration of expedited policy;
- ✓ Existing programs of study at the institution;
- ✓ Community and industry partnerships;
- ✓ Accreditation;
- ✓ Administrative structure;
- ✓ Enrollment and graduate projections;
- ✓ Alignment with State Master Plan and institutional mission profile;
- ✓ Student interest;
- ✓ Existing programs offered at public and private Tennessee universities; and
- ✓ Articulation and transfer.

EAST TENNESSEE STATE UNIVERSITY

EXPEDITED LETTER OF NOTIFICATION (LON)

BS Mechatronics Engineering

Table of Contents

East Tennessee State University
Office of the President
Box 70734 • Johnson City, Tennessee 37614-1710 • (423) 439-4211 • Fax: (423) 439-4004

October 10, 2022

Dr. Emily House
Executive Director 404
James Robertson
Parkway Suite 1900
Nashville, TN 37243

Dear Dr. House:

In accordance with Tennessee Higher Education Commission Policy A l.6 section 1.6.4A, I am submitting this request for consideration to utilize the Expedited Academic Approval Process for the development of a Bachelor of Science, Mechatronics Engineering degree, at East Tennessee State University.

This degree is aligned with the definition of programs subject to approval for an expedited review as identified in section 1.6.2A. Mechatronics Engineering is in the identified CIP code area of 14-Engineering, on the THEC Expedited Letter of Notification checklist as a high-demand program in Science Technology, Engineering, and Mathematics (STEM).

Mechatronics combines mechanical and electrical engineering with robotics and systems controls. According to the U.S. Bureau of Labor Statistics, mechatronics engineering is expected to grow through 2026 at an above-average rate of 6.4 percent. The estimated annual salary for a mechatronics engineer is approximately $99,040 per year. Substantial demand for mechatronics engineers exists within business and industry in Northeast Tennessee as well as across the state and nation. This program would greatly enhance ETSU's academic portfolio and would align with state and local efforts to increase high-quality employable graduates while enhancing the quality of life in our region.

Thank you for your consideration of this request and I look forward to your response.

Sincerely,

Brian Noland
President
cc: Dr. Julie Roberts, THEC Chief Academic Officer
Dr. Kimberly McCorkle, Provost and Senior Vice President for Academics, ETSU
Dr. Tony Pittarese, Dean, College of Business and Technology, ETSU

EMILY HOUSE
Executive Director

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

BILL LEE
Governor

October 17, 2022

Dr. Brian Noland
President
East Tennessee State University
P.O. Box 70734
Johnson City, TN 37614 Dear

President Noland:

Thank you for the submission of a formal request for consideration to utilize the Expedited Academic Approval Process for the proposed Mechatronics Engineering, Bachelor of Science (BS) program at East Tennessee State University.

After reviewing your letter, I approve ETSU's request to move forward to the Expedited Letter of Notification (ELON) stage for the proposed program. Please ensure the ELON is in alignment with THEC Academic Policy A1.6 – Expedited Academic Programs: Approval Process.

Best of luck in the continued development of this program. Sincerely,

Emily House, PhD

cc: Kimberly McCorkle, ETSU Provost and Senior Vice President for Academics
William Flora, ETSU Associate Provost for Curriculum
Julie A. Roberts, THEC Chief Academic Officer Katherine
Bracket, THEC Director of Academic Affairs

EAST TENNESSEE STATE UNIVERSITY

Overview

Institution name proposed academic program, degree designation, proposed CIP code, and CIP code title:

Institution Name: East Tennessee State University
Proposed Academic Program: Mechatronics Engineering
Degree Designation: BS
Proposed CIP Code: 14.4201
CIP Code Title: Mechatronics, Robotics, and Automation Engineering

Academic Program Liaison (APL) Name and Contact Information:

Kimberly McCorkle
Provost and Senior Vice President for Academics
P.O. Box 70733
Johnson City, TN 37614
(423) 439-4811
mccorklek@etsu.edu

Proposed Implementation Timeline:

- ***Proposed date (month and year) of the institutional governing board's meeting to consider the proposed academic program for approval:***
  It is anticipated that the ETSU Board of Trustees will consider this degree proposal at the November 2022 meeting.
- ***Proposed dates for the external judgment site visit:***
  The external site visit will be in January of 2023.
- ***Estimated date of submission of the external review report to THEC and the institution (within 30 days following the site visit):***
  The external review report would be due in February of 2023.
- ***Estimated date of institution's response to the external review (within 30 days of receiving the external reviewer's report):***
  The ETSU institutional response to the external review would be submitted in March 2023.
- ***Proposed date (month and year) of the Tennessee Higher Education Commission meeting to consider the proposed academic program for approval:***
  It is anticipated that the full ENAPP would be complete and ready for consideration at the May 2023 Commission meeting.
- ***Proposed implementation date (semester and year) when students will enroll in the proposed academic program:***
  The program could begin accepting students in the fall semester (August) 2023

- ***Estimated timeline for proposed programs that will seek programmatic accreditation***
- The program will apply for ABET (www.abet.org) accreditation. This is the same organization that currently accredits our Engineering Technology and Engineering Programs. The typical timeline is to apply for accreditation review after the first graduates have completed the degree which is anticipated to be *May 2027.*

Background and Overview

Background narrative:

The proposed degree program is a Bachelor of Science in Mechatronics Engineering. This degree and its cross-content infrastructure has recently become in demand by manufacturing. At ETSU our regional industry has shared the need to provide a workforce capable of implementing advanced manufacturing methods to remain competitive in a global economy. In Tennessee the number of employees in the manufacturing area accounts for 15.32% of the total output in the state, employing 11.47% of the workforce in 2018. Total output from manufacturing in Tennessee was $56.01 billion in 2018. In addition, there were an average of 357,000 manufacturing employees in Tennessee in 2019, with an average annual compensation of $70,521.26 in 2018.[1]

Manufacturing is changing, and a new workforce is needed to implement these changes in the way we produce goods and materials. The accepted term for this seed change is "Industry 4.0"– which effectively states that to become competitive industry must adopt new production methods employing advanced technologies.[2] The generally accepted content areas needed to support the industry as it relates to the production of goods and materials in this new environment require advanced manufacturing techniques. This degree will support the workforce needs of Tennessee manufacturers. The areas of study for the degree include robotics, automation, advanced sensors systems, control systems, and other areas that when employed make manufacturers more competitive and able to produce goods at high quality with reduced labor costs. A formal definition is:

> Mechatronics Engineering is an interdisciplinary branch of engineering that focuses on the integration of mechanical, electrical, and electronic engineering systems, and also includes a combination of robotics, electronics, computer science, telecommunications, systems, control, and product engineering.[3, 4]

The program of study will have the same credit hour requirements of other engineering degrees – 128 credit hours. The program will include math and science requirements inherent in engineering programs. The courses in the degree area will be related to robotics, automated production control, advanced sensor, security of production systems, production modeling, and other related areas with a core of Mechatronics courses comprising somewhere between 60 and 70 credits of the degree content. A review of other Mechatronics degree programs both in Tennessee and in other states shows that this is a standard allocation of credit hours needed for the degree area.[5, 6] While the Bureau of Labor Statistics only has data for Mechatronics Technology degrees the general area of Mechatronics Engineering is new and growing. A recent paper, June 2020, made the following findings:

The field of Mechatronics and Robotics Engineering (MRE) is emerging as a distinct academic discipline. Previously, courses in this field have been housed in departments of Mechanical Engineering, Electrical Engineering, or Computer Science, instead of a standalone department or curriculum. More recently, single,

[1] Tennessee 2020 Manufacturing Facts, National Association of Manufacturers, September .2020

[2] Manufacturers' Guide to Industry 4.0 Technologies, NIST.gov, https://www.nist.gov/mep/manufacturing-reports/current-state-manufacturing , Sourced Oct. 2, 2022

freestanding courses have increasingly grown into course sequences and concentrations, with entire baccalaureate and graduate degree programs now being offered. The field has been legitimized in recent years with the National Center for Education Statistics creating the Classification of Instructional Programs (CIP) code 14.201 Mechatronics, Robotics, and Automation Engineering. As of October 2019, ABET accredits a total of 9 B.S. programs in the field: 5 Mechatronics Engineering, 3 Robotics Engineering, 1 Mechatronics and Robotics Engineering, and none in Automation Engineering.[3]

The final curriculum to be submitted in a later document will address the specific direction and scope of past successful programs. Course and lab delivery will be on-ground, although some course content can be offered online.

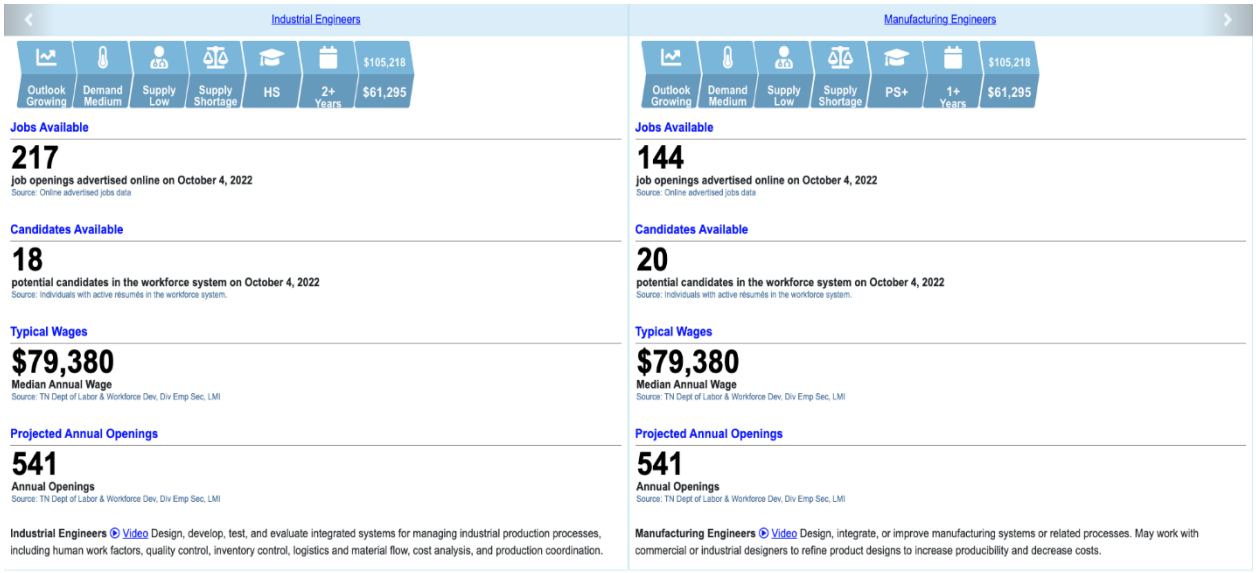
Justification for consideration of expedited policy:

A 2017 article in the *Tennessean* entitled "Tennessee manufacturers need skilled workers" noted Tennessee has a current deficit of technically skilled workers. According to the article, in 2017 nationally 47% of manufacturing requires additional skilled workers while for Tennessee that number was 60%. This number is further impacted by the large number of employees in manufacturing areas who will be retiring over the next 10 years. Another source indicates that Tennessee is shifting manufacturing practices and that currently employment concentration in advanced manufacturing is 31% above the national average for our manufacturing concerns in Tennessee.

Currently, in Tennessee, there is a shortfall of engineers in the areas related to manufacturing support (Industrial and Manufacturing Engineering). The Tennessee Department of Labor's system to identify current openings versus available employees shows the overall need for developing more engineering programs and graduates to fill the needs of the state, shown in Figure 1. Further detail based on the Tennessee Department of Labor and Workforce Development shows that for Industrial engineering and Manufacturing engineering:

> Growth plus replacement needs for Industrial Engineers in Tennessee are estimated to average about 541 openings per year from 2020-2030. Of these estimated 541 openings per year, 29.2% are due to growth (new positions) and 25.0% are due to exits (workers leaving the labor force), and 45.8% are due to transfers (workers changing occupations).

[3] *Mechatronics and Robotics Education: Standardizing Foundational Key Concepts, ASEE, June 2020, Perma Link:* https://peer.asee.org/34966



Furthermore, a report produced by the Tennessee Department of Labor provided the need for additional growth for STEM graduates with the following commentary:

> Tennessee will experience significant growth in STEM occupations over the decade through 2026. In 2016 there were 138,100 STEM employees. The level will increase to 167,950 in 2026. The 29,850 additional STEM jobs will make up 8.44 percent of the jobs being added in the state through 2026. Additionally, STEM occupations are projected to grow nearly twice as rapidly as all occupations in Tennessee. New STEM jobs as a whole are expected to grow by 21.6 percent from 2016 to 2026, while growth rate for all jobs is expected to be 11.4 percent. Although less than 10 percent of all new jobs in the state, STEM jobs are important because many are faster growing, high wage occupations for which significant shortages of job candidates exist and which are vital to the burgeoning information economy.[4]

In summary, Tennessee is facing shortages of engineers and STEM related jobs projecting into 2026. STEM related jobs will grow at twice the rate of all other occupations. In the upper East Tennessee region, specifically, manufacturing represents a large portion of employers. This degree will support both the workforce needs as well as provide graduates who are ready to adopt the latest technologies to optimize manufacturing output. This degree program will meet industry needs as well as offer graduates across the state, and especially those in northeast Tennessee and the Appalachian Highlands region, the credentials to compete for high-paying jobs.

Existing programs of study at the institution:

The proposed ETSU BS Mechatronics Engineering program is not being developed from an existing ETSU engineering program. The College of Business and Technology (CBAT) already houses engineering programs in the Department of Engineering, Engineering Technology and Surveying. The Mechatronics

[4] Tennessee Department of Labor, STEM Jobs Report 2019, https://www.jobs4tn.gov/admin/gsipub/htmlarea/uploads/LMI/Publications/STEMReport2019Updated.pdf, sourced Oct 5, 2022

program will be housed in the current Department of Engineering, Engineering Technology and Surveying.

Community and industry partnerships:

Letters of support are included in the appendix, beginning on page 14. The letters are from the following ETSU partner organizations: Cross Company, Northeast State Community College, Siemens Industrial Automation, Inc., JTEKT North American Corporation, and SKF Lubrication Management.

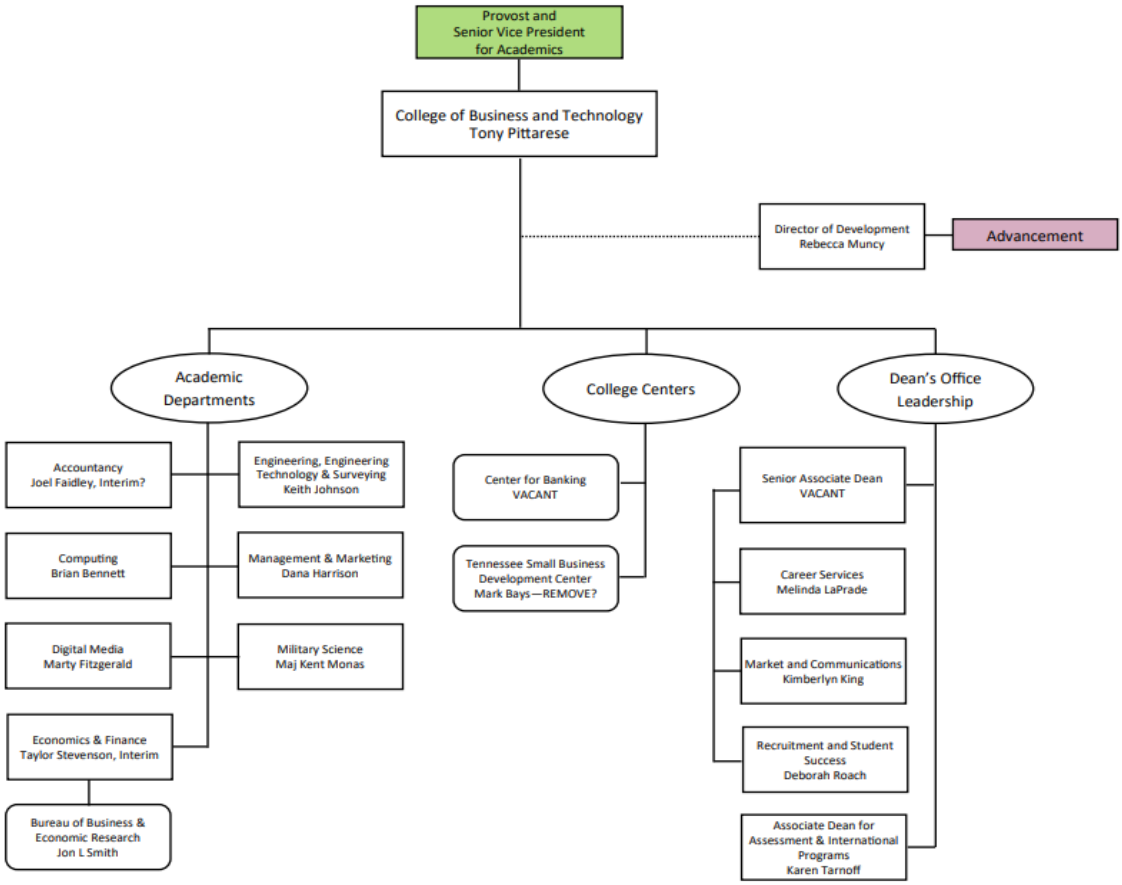
Accreditation

Accreditation:

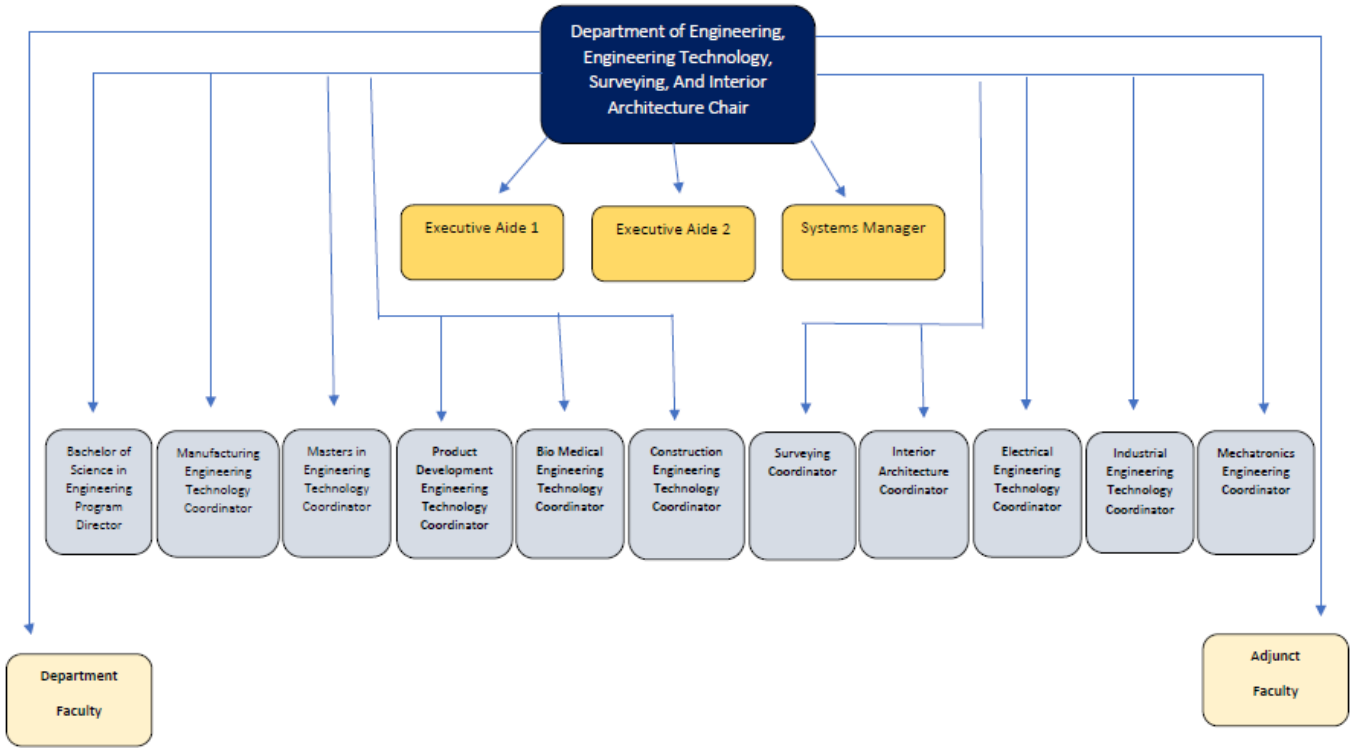
The program will apply for ABET (www.abet.org) accreditation. This is the same organization that currently accredits our Engineering Technology and Engineering Programs. The typical timeline of application for accreditation is to apply for review after the first graduates have completed the degree. Therefore, after four years of student participation in the program and after the first seniors have graduated an application will be made to ABET seeking accreditation. ABET will then conduct an onsite review of the program in the following Fall and then issue findings in the Summer. ETSU has never had an EAC/TAC program fail to gain or maintain ABET accreditation.

Administrative Structure

ETSU has, within the College of Business and Technology, a well established Department of Engineering, Engineering Technology, and Surveying. There will not be a need to establish a new academic unit for the proposed Mechatronics program. Note below, the current organiztional flow chart for the College of Business and Technology.



Below is an additional flow chart for the Department of Engineering, Engineering Technology and Surveying indicating that Mechatronics Engineering will be within the structure of the current department.



Enrollment and Graduation Projections

Table 1 - Projected Enrollments and Graduates

Projected Enrollments and Graduates				
Year	**Academic Year**	**Projected Total Fall Enrollment**	**Projected Attrition**	**Projected Graduates**
1	2024-2025	8	2	0
2	2025-2026	15	3	0
3	2026-2027	25	5	0
4	2027-2028	40	7	6
5	2028-2029	55	9	12

Institutional Alignment and Demand

Alignment with State Master Plan and institutional mission profile:

The proposed ETSU BS Mechatronics Engineering degree aligns with the central theme of the THEC master plan which is to support Tennessee students and institutions toward greater success in workforce alignment while increasing the level of educational attainment across the state. Mechatronics is an emerging field of engineering that is identified as an occupational area considered to be above average in growth over the next decade. This program will enable students to access a high-quality education in a field that will have not only strong employment opportunities but will also have strong average salaries. Tennessee has a strong labor market for engineering related jobs and will have growth in that area with the Blue Oval plant, being built by Ford. Moreover, in Northeast Tennessee, a local partner, Eastman, Siemens, SKF, and other local employers are supportive of this program and the potential for graduates in this field. The BS Mechatronics degree will give graduates a competitive edge in the marketplace as well as enhance educational attainment across the region and state.

The East Tennessee State University's vision and mission statements center on providing educational opportunities for students not only to learn and grow but to be professionally prepared for employment. It is also central to the mission of the university to improve the quality of life in the region. The Mechatronics Engineering program will prepare students for post-graduation in the region and across the state and nation. Jobs in this field pay above-average wages and students will not only have individual opportunities but will also participate in growing the quality of life in the region.

The BS Mechatronics Engineering degree will enhance the ETSU portfolio of offerings and produce employable graduates that will make a positive difference in the region, state, and nation.

Student interest:

Student interest in all STEM-related areas is on the rise in the state. The Tennessee Department of Education is actively working to increase student interest in STEM-related fields. A 2019 report outlined growth and efforts to increase growth in student interest, the report noted the following:

> In the 2016-2017 school year, 118 schools in Tennessee responded to the demand to grow local talent in emerging STEM fields and instituted special programs of study in the STEM cluster. District data from SY 17-18 suggest that 104 schools will implement a STEM program of study at the beginning of the SY.19 These figures demonstrate that there is an appetite among schools—and students—to explore STEM at the high school level, which bodes well for the growing number of postsecondary institutions to offer STEM-related programs.

This investment in STEM education for K-12 students will present itself as an increase in demand for STEM education in higher education institutions within the state. An article in the January 12, 2022 edition of the *Knoxville News Sentinel* noted that the Tennessee Higher Education Commission is incentivizing STEM education at Tennessee's colleges and universities. The following quote shows that the need is growing and Tennessee is responding by valuing STEM Education:

> To meet demand for STEM and health care workers over the next decade, Tennessee may soon incentivize its community colleges and universities to recruit and graduate students in those fields. The Tennessee Higher Education Commission is proposing a change to its funding formula that would give more money to colleges for students majoring in high-need academic fields. About a quarter of all

associate degrees, a third of all bachelor degrees and over half of community college certificates would qualify for this premium, according to the Tennessee Higher Education Commission. Gov. Bill Lee asked the commission to adjust the formula to be more responsive to the workforce demands ahead in the next 10 years. The extra money will help community colleges and universities afford creating and supporting high-cost degrees like engineering and other STEM programs.

Governor Bill Lee and the TN Dept. of Education released in the Fall of 2021 a presentation showing the effects of growing STEM demand in the State. Currently there are 61 high schools that are designated as STEM priority schools. The reality is that if STEM offerings are not increased in higher education, we will soon not have enough offerings to support the demand that is being grown in K-12 systems for STEM, which could result in these capable students leaving the state to meet their higher education goals. This ELON has shown that the demand for new STEM related programs in general and more specifically this application for a new Mechatronics Engineering program is growing in both directions from the K-12 schools who are creating more STEM related curriculums and from the manufacturers and industry in the state who need a very specialized high-tech workforce to remain competitive – "if we don't build it someone else will" - and that may be other states.

In addition, areas like Mechatronics are popular choices for students who return to college to complete their degrees. A recent report on exemplary degree completion programs highlighted the public-private partnerships that Northeastern University developed with a diverse group of industries to provide degree completion options for their employees.[5] One area of great interest for industry and returning students was mechatronics. ETSU has demonstrated its ability to forge public-private partnerships such Blue Sky with Blue Cross Blue Shield of Tennessee. While we do not have partnerships identified at this time, ETSU will be poised to meet industry demands for upskilling current employees who may need to return to college to complete their degree, which aligns with THEC's Drive to 55 goals.

Existing programs offered at public and private Tennessee universities:

- Middle Tennessee University BS Mechatronics Engineering CIP 09.14.4201.00
  Graduation: 2019/20 – 59 graduates
  2020/21 – 59 graduates
  2021/22 – 64 graduates
- University of Tennessee, Chattanooga BAS Mechatronics Engineering Technology
  CIP 09.15.0403.00
  Graduation: 2019/20 – 9 graduates
  2020/21 – 10 graduates
  2021/22 – 11 graduates
- Vanderbilt University a focus area in Mechatronics within the BE Mechanical

Mechatronics engineering is a new and emerging field and although there are engineering programs at most Tennessee universities, programs specific to Mechatronics are limited.

Due to the ABET accreditation process this program will have similar content areas to engineering degrees in the same CIP code. This program will vary with course offerings that are specific to the needs of regional partners and to the distribution of content across areas such as automation, controls,

[5] Hanover Research. Degree Completion Programs. January 2022 report. p.5

and computing. An example would be the focus of computing on control process to enhance hardware and software security, an overlapping area of engineering and cyber security. Recently network security has become a large concern for manufacturers to isolate equipment operations, control systems, and manufacturing data from hacking.[6]

Articulation and transfer

The areas of study for the Mechatronics Engineering degree cover the areas of robotics, automation, advanced sensors systems, control systems, and will have curriculum components that are interdisciplinary such as product engineering, computer science, and electronics. Students with background in math, physics, computer science and automation can benefit from this program. The proposed Mechatronics engineering program will accept credits from the Engineering Tennessee Transfer Pathway (TTP), appropriate credits from the Engineering Technology and other TTPs, and appropriate, transferable credits from other AAS and AS degree programs. Students in the following associate of science pathway may also benefit from the degree, Computer Science, Mathematics, Physics, and Imaging Sciences or any STEM-focused pathway.

Chattanooga State Community College and Jackson State Community College have pathways for Civil Engineering, Electrical Engineering and Engineering Technology that can be articulated for transfer into the proposed bachelor's program.

In addition, ETSU has articulated transfer with Walters State and Northeast State Community College for the current engineering technology program and joint engineering program. We anticipate offering similar articulation agreements for the Mechatronics Engineering degree.

[6] Cybersecurity for smart factories, Tools for managing cyber threats to manufacturing, Sean Peasley, Deloitte & Touché, 2019.

Appendix

ETSU Letters of Support
BS Mechatronics

Appendix-A

Hello,

Cross Company is always looking for someone with a computer, electrical, or a systems degree. Our Field Service Engineers work with a wide variety of Process Control Systems, or sometimes called Industrial Control Systems. Part of the job would be to communicate with devices that measure and control pressure, flow, temperature, gas detection, and level. In this role, they perform risk assessments, troubleshoot, repair, maintain, adjust system components and replace defective parts. Additional responsibilities include quality calibrations on a wide variety of precision measurement equipment, adhering to corporate quality standards and procedures. Below are some of the duties and responsibilities.

- Engineering services to support the installation, start-up, maintenance and operation of process control systems.
- Verification and validation of Control Systems; Safety Instrumented Systems (SIS), Distributed Control Systems (DCS), Supervisory Control and Data Acquisition (SCADA) and Programmable Logic Controller (PLC).
- Low voltage electrical work to support installation, commissioning, troubleshooting, and minor repairs. No conduit installation or high voltage work is required.
- Experience with communications protocols and industrial networking is required. These should include 4-20mA/HART, Modbus, Profibus, Ethernet, etc.
- Familiarity and/or experience with final control devices such as industrial control valve actuators, variable frequency drives, and mechanical relays
- Limited Calibration, installation, and perform preventive maintenance, repair or replacement on a variety of instruments including but not limited to various flow types, D/P, Mass, volumetric, Various level types, Pressure, Temperature both RTD and TC and Vibration.

We have worked with David Ward, an ETSU graduate, and have been very pleased and impressed with his knowledge and ability to pick up things quickly. David had a very good base of knowledge, but could have greatly improved his initial skills with more in depth training on the applicable skills needed in todays industrial world

Best Regards,
Todd Barnette

PSG Service Engineering Manager
Todd.Barnette@crossco.com

Appendix - B

NORTHEAST STATE
We're here to get you there

October 12, 2022

Dr. Joseph Sims, Director/Professor
Engineering, Engineering Technology and
Surveying East Tennessee State University
PO Box 70552
Johnson City, TN 37614

Dear Dr. Sims:

Northeast State Community College would like to express its support for East Tennessee State University's proposal to develop and implement a Bachelor of Science of Engineering in Mechatronics.

Northeast State recognizes the need for a four-year degree pathway for our students as they pursue promotions within regional and global companies. Currently, placement rates of our Associate degree graduates and students completing technical certificates are exceeding expectations. However, we value partnerships where students can engage in additional education, such as this one with East Tennessee State University. Our student population in Computer Science, Electrical Engineering, and Manufacturing degree programs have the potential to benefit in transfer opportunities with ETSU.

We look forward to the progress the university makes in developing a Bachelor of Science of Engineering in Mechatronics and future discussions of articulation opportunities that can benefit both Northeast State and ETSU students.

Donna Farrell

Sincerely,

Donna Farrell, Ed.D.
Dean, Technologies Division

We're here to get you there

Northeast State Community College
A Tennessee Board of Regents Institution

2425 Highway 75. P.O. Box 246
Blountville, TN 37617
423.323.3191 Fx 423.279.7636
www.NortheastSlale.edu

Appendix - C

SIEMENS

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Siemens Industrial Automation, Inc.
One Internet Plaza
Johnson City, Tn. 37604

October 17, 2022

Mr. Paul Sims Ph.D.
Professor and Director
East Tennessee State University
Wilson Wallis Hall
Johnson City, TN 37614

Mr. Sims,

This correspondence is regarding East Tennessee State University's proposal to add a Mechatronics Engineering degree to your engineering program offerings.

The Siemens site here in Johnson City has a product development team (>100) that design and develop a host of automation products and software.

As you might imagine, it is very beneficial for our potential employment candidates to have knowledge of Automation, Programmable Logic Controllers, Computer Science, Communications, Systems, and other related technologies.

Our experience with past candidates holding an ETSU degree has been very positive. We currently have employment openings with requirements that your proposed Mechatronic Engineering degree would support very well.

I sincerely hope ETSU is successful with adding a Mechatronics Engineering degree to its course offerings. I feel that it would greatly benefit our local Siemens development team and other local technology companies here in the Johnson City region.

Best of Luck!

Regards,

Ned Cox
Director of Engineering
Ned.cox@siemens.com

Appendix – D

JTEKT

Matt Raby
5932 Commerce Blvd
Morristown, TN 37814 10/3/2022

Dearest Dr. Paul Sims:

I have it on good faith that a Mechatronics Engineering degree is under development at East Tennessee State University. This knowledge assures me of a bright future for manufacturing in our region and I wish to offer my assistance in furthering this effort.

It is my opinion that automation and innovation are the cornerstone concepts underlying the future of American manufacturing. Collaborative robotics, machine vision, A-I computing, and database /part traceability will be core constructs added to traditional manufacturing methods. It seems that this new degree would encapsulate all these requirements.

At all JTEKT locations throughout East Tennessee, we have seen students from ETSU hit the ground running as your programs prepare them with real-world, hands-on experiences. They quickly adapt to our manufacturing situation and are often able to implement new methods that improve throughput and productivity. It excites me to know that soon I would have an even better choice of prepared graduates ready to make my company stronger.

Please let me know how I can assist in any manner.

Regards,

Matt Raby

Production Engineering Supervisor

JTEKT North America Corporation

Mobile: (423) 312-9632

Appendix - E

October 6, 2022

To: Tennessee Higher Education Commission

Re: Letter of Support
ETSU - Mechatronics Engineering

To Whom It May Concern:

It has come to our attention that ETSU has been given permission to pursue a **B.S. Engineering in Mechatronics.** Furthermore, it is our understanding that this program is intended to be an interdisciplinary branch of engineering that focuses on the integration of mechanical, electrical and electronic engineering systems, and also includes a combination of robotics, electronics, computer science, telecommunications, systems, control, and product engineering.

The SKF Lubrication Business Unit, with a factory location under the Alemite brand in Johnson City, Tennessee is a leader in the design, manufacture, and supply of highly engineered automatic lubrication systems as well as lubrication tools and equipment. SKF worldwide has employees in 130 countries developing bearing technology and services that make rotation more reliable and sustainable. At our factory location in Johnson City, TN, we recently hired 2 graduates from ETSU with a B.S. in Engineering Technology.

From an industry standpoint, future focus will be on robotics, controls, instrumentation, and advanced manufacturing processes. At SKF Lubrication in Johnson City, we absolutely believe we could use someone from this program in the next few years, especially with our planned migration to Fanuc robots and program driven machining. Like many employers in this area, we need hi tech workers and workforce development is critical to success. For that reason, please consider this our letter of support for ETSU's development of a new engineering degree with focus on Mechatronics.

Sincerely,

Daniel Leathers
Manufacturing Engineering Manager

Nancy McGinty
Human Resources Manager

SKF Lubrication Management
Alemite, LLC
167 Roweland Drive
Johnson City TN 37601