

COLUMBIA STATE COMMUNITY COLLEGE

2024 Governor's Investment in Technical Education (GIVE 3.0)

Program Title: Columbia State Robotics Training Center

Lead Entity Name: Columbia State Community College

Fiscal Agent: Columbia State Community College

IN PARTNERSHIP WITH:

1. Workforce/Economic Development Agency:  
Maury County Chamber & Economic Alliance  
Lawrence County Chamber of Commerce

2. Higher Education Institution:  
Middle Tennessee State University

3. LEA/School District Names:  
Maury County Public Schools  
Marshall County Schools  
Hickman County Schools  
Lawrence County School System  
Lewis County Schools

4. Employer Partners:  
GCP Applied Technologies  
Landmark Ceramics  
Talos Engineered Products

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Funding requested:

**\$2,000,000**

  
Janet F. Smith (Apr 22, 2024 14:11 CDT)

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Daniel Garrett, Project Director

(Fiscal Agent)

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## **Abstract/ Project Summary**

Columbia State Community College's Engineering Systems Technology (EST) program is established in Fairview High School (Williamson County Schools), Hickman County Schools (East Hickman High School), Maury County Public Schools (Columbia Central High School and Spring Hill High School), and Lawrence County School System (Loretto High School). Building upon the success of the Columbia State EST project GIVE 2.0, Columbia State proposes further expansion of the program by establishing the Columbia State Robotics Training Center, to meet the growing demand for skilled workers in robotics and electrical engineering in southern middle Tennessee.

Key components of the proposal include establishing a state-of-the-art Robotics Training Center at the CoSCC campus in Columbia, TN, offering a robust curriculum leading to a 1-year certificate and 2 new specializations in the EST AAS degree. The first in Robotics will offer industry-recognized FANUC, SACA, and Cognex Vision Certifications. The other will be an Electrical Engineering Technology program that is more theory based. Two new labs will support these efforts. The project involves collaboration with local high schools to expand program offerings and provide dual credit and dual enrollment opportunities. Additionally, the AAS in Engineering Systems Technology requires students to enroll in a credit bearing internship experience. Therefore, in addition to making college a reality by bringing college to students who do not always have transportation, time, and resources to attend college and earn a degree, funding from this grant project would also increase the number of WBL opportunities in engineering and engineering related occupations.

**SECTION 1: DEMONSTRATION OF NEED**

Columbia State Community College (CoSCC) serves nine counties in southern middle Tennessee. Within its service area, CoSCC has five campuses with an overall enrollment of over 5,500 students. The College has a solid working relationship with each school district in its service area, including the districts that will partner with CoSCC on this grant proposal: Maury County Public Schools, Marshall County Schools, Hickman County Schools, Lawrence County School System, and Lewis County Schools.

Columbia State confers Associate of Applied Science (AAS) and Technical Certificate in Engineering Systems Technology (EST). The EST program at CoSCC has state-of-the-art, world-class training equipment that helps provide students with the skills needed to work with complex synchronized pieces of equipment. The program has received Smart Automation Certification Alliance (SACA) Gold Certification for multiple disciplines, which allows us to offer those tests to students and increase the number of nationally recognized certifications we offer to students. Currently, through partnerships with area school districts, students at Fairview High School in Williamson County can graduate with an AAS degree or a technical certificate in EST, and students at East Hickman High School in Hickman County can earn a technical certificate. Utilizing GIVE 2.0 funds, Columbia State's EST program expanded program offerings in Maury County Public Schools' Spring Hill and Columbia Central High Schools, Marshall County Schools Spot Lowe Technology Center, Lawrence County Schools' Loretto High School, and TCAT Pulaski. Additionally, GIVE 2.0 funds were utilized to purchase a box truck that was modified into a classroom space outfitted with two functioning FANUC robots for mobile training. With dual credit and dual enrollment courses, practice and training on equipment, and work-based learning experiences, these students graduate high school from persistent poverty zones and at-risk counties prepared to enter high demand occupations with skills in electrical and mechanical components,

electric motors, pneumatic and hydraulic controls, programmable logic controllers (PLCs), and robotics, or continue their education with a certificate or associate degree already in hand.

GIVE 3.0 funds will be used to establish the Columbia State Robotics Training Center at the Columbia campus, a transformative initiative aimed at remodeling an existing building into a cutting-edge facility for robotics education. In partnership with Columbia Central High School, Marshall County Schools through the Spot Lowe Vocational Center, Lawrence County School System, Hickman County Schools, and MTSU, this center will offer a robust curriculum leading to a new 1-year certificate and 2 new specializations in the EST AAS degree. The first in Robotics will offer industry-recognized FANUC, SACA, and Cognex Vision Certifications. The other will be an Electrical Engineering Technology program that is more theory based. Two new labs will support these efforts. An amazing robotics focused lab and a state-of-the-art university-quality Electronics Teaching Lab. The electronics lab will allow students to build kits, study electronics, and is not currently represented on any Columbia State Campus positively affecting all branches of EST and CoSCC Physics. This also reaches a THEC High Demand skill. The robotics lab will booster multiple manufacturers of robots used in work cells, palatizing activities, object manipulation. The programming and troubleshooting learned here will directly lead to high paying Robotic and Controls jobs within our community.

The initiative will fill critical skills gaps in our regional workforce, providing students with invaluable work-based learning experiences and internships while preparing them for high-demand careers in robotics. Through this project, we commit to not only addressing immediate educational and workforce needs but also ensuring the program's long-term sustainability and adaptability of the program. The students graduating from this program will have certifications that will make them

very employable in Robotics Technician, Electrical Engineering Technician, and Industrial Engineering Technician Jobs.

**Drive to 55**

This project will build upon the success of GIVE 2.0 by introducing a new Robotic Technician Program, providing additional opportunity for students to earn college level credits while receiving training in robotics and electrical engineering technician. This will increase the number of students with either a certificate or an AAS degree and provide the skilled labor for the positions available in southern middle Tennessee job market.

By partnering with these school districts, this grant proposal would increase the pipeline in the EST program to meet the growing local workforce demands, but also would positively impact Drive to 55 goals in multiple counties.

According to TSAC 2024 Higher Education County Profiles, annually 98 additional students from counties to be served by this grant must enroll in college to increase the college-going rate by five percent.

	<b>Class of 2022 College-Going Rate</b>	<b>Number of Additional Students Needed to Enroll in College to Increase the College-Going Rate by 5%</b>
Maury County	50.3%	38
Marshall County	45.8%	18
Hickman County	49.2%	12
Lewis County	61.8%	6
Lawrence County	56.5%	24

Funding of the Engineering Systems Technology Mobile Classroom and Robotics Expansion grant project can increase the college-going rate. For this grant, the proposed target is to increase the “college going rate” by at least 55 annually and 220 over the course of the 48-month GIVE grant period. The target was derived given the following parameters: a.) average 2023 graduation rate for the high schools targeted in this project is 87.9%<sup>1</sup> and b.) not all students will be interested in engineering as the most popular majors are health science related at CoSCC. The overall target

lets CoSCC begin hiring faculty immediately to begin development then a phase approach will allow equipment to be purchased as the space becomes available and the program is ready for it. The entire process will be governed by the Industry advisory council staffed by not only the employers and agencies on this proposal, but also the students, faculty and other community members. Recruitment efforts will begin with CoSCC’s high school and Chamber of Commerce partners, but advertising has been budgeted for to reach a wider audience.

**LEAP 2020: In Demand Occupations**

According to the LEAP 2020: In Demand Occupations, Engineering and Engineering-Related Occupations are “In Demand” in southern middle Tennessee.<sup>ii</sup> The below table reflects information on these occupations, which require either a postsecondary certificate or associates degree, as in the LEAP 2020 report.

<b>Occupation</b>	<b>Entry Level Wage</b>	<b>2019 Ratio of Postings to Hire</b>	<b>Projected Annual Job Openings over Next 10 Years</b>
Electrical and Electronic Engineering Technologists and Technicians	\$34,667	1.2	30
Mechanical Engineering Technologists and Technicians	\$37,884	2.3	20

According to the LEAP 2020 In-Demand Occupations report, more than 14,400 engineering technicians, drafters and mapping technicians were employed in Tennessee in 2019. This category of occupations is growing at a rate of 6% in Tennessee, compared to 1% nationally. Additionally, per the LEAP report, “Engineering-related occupations, like drafters, engineering and mapping technicians are found in the following industries: architectural, engineering, and related services; motor vehicle parts manufacturing; building equipment contractors; navigational, measuring, electromedical, and control instruments manufacturing; electrical equipment manufacturing; semiconductor and other electronic component manufacturing; rubber product manufacturing;

plastic product manufacturing; and machinery, equipment and supplies merchant wholesalers, among others.”<sup>iii</sup> The data is clear that opportunities abound for these students.

**U.S. Bureau of Labor Statistics**

According to the Bureau of Labor Statistics Occupational Employment and Wages, May 2023, Tennessee shows healthy employment Electrical and Industrial Engineering Technologists<sup>iv</sup>.

Occupation	Employment	Location Quotient*	Employment per 1,000
	TN	TN	TN
Electrical and Electronic Engineering Technologist	2,290	1.11	0.712
Industrial Engineering Technologists	2,360	1.52	0.732

\*The location quotient is the ratio of the area concentration of occupational employment to the national average concentration. A location quotient greater than one indicates the occupation has a higher share of employment than average. As indicated above, south central Tennessee has a significantly higher share of employment in these categories than the state.

**MIT Living Wage**

Wage information for Maury and Marshall Counties was used as the benchmark to determine if the occupations associated with these programs constitute a living wage as the initial focus of this project will be those counties. According to the MIT Living Wages Calculator, the annual income to constitute a living wage for one adult with no children in Maury County is **\$44,429** in Marshall County is **\$39,936**<sup>v</sup>. According to the Bureau of Labor Statistics Occupational Employment and Wages, May 2023<sup>vi</sup>, annual mean wages in occupations suitable for Robotic Technician graduates well exceed the living wage in these counties:

Occupation	Annual Mean Wage
Electrical and Electronic Engineering Technologist	\$61,860
Industrial Engineering Technologists	\$58,440



**TN Education and Workforce Maps**

Tennessee Board of Regents TN Education & Workforce Maps provides information about higher education and job projections across the state. The job outlook for graduates of the Robotics Technician program is strong, including two occupation groups which could feed from this program<sup>vii</sup>.

<b>Occupation</b>	<b>Projected Average Annual Job Openings</b>	<b>Projected Ratio of Graduates to Jobs</b>	<b>Projected Annual Job Growth Rate</b>
Industrial Engineering Tech.	65	0.37	1.6%
Electrical Engineering Tech.	65	0.37	1.6%

**Jobs4TN.gov**

Data from Jobs4TN.gov shows that there are numerous open positions across the state that would be suitable for a Robotics Technician graduate. As of April 24, 2023, the following positions posted:

<b>Position</b>	<b># of Available Jobs</b>
Robotics Technician	200
Engineering Technician	244
Maintenance Technician	2919
Industrial Technician	99
Multi-Craft Maintenance Technician	56
Control Systems Technician	127
PLC Programmer	120

**Additional Supporting Information**

A 2021 Workforce Alignment Study completed by the Maury County Chamber and Economic Alliance and Boyette Strategic Advisors assessed the workforce in a nine-county labor market area inclusive of the counties to be served under this grant and provided an alignment process to ensure efficient and effective use of workforce resources (Appendix E). Results from the study indicate that this grant project would contribute to the growing workforce demands of the area with well-paying employment opportunities. The study indicates Advanced Manufacturing as one of the leading opportunity sectors, with a projected 17% increase in jobs by 2025, and average annual

earnings of \$67,897 in Maury County. The study also identified current and potential future skills gaps that the grant project would address.

Projections Central, a website sponsored by the US Department of Labor's Employment & Training Administration, includes short-term labor projections (2023–2025) and long-term labor projections (2020–2030) for participating states<sup>viii</sup>. Occupations suitable for EST graduates are projected to increase significantly in Tennessee, as shown in the table below:

<b>Occupation Name</b>	<b>% Change</b>	<b>Avg. Annual Openings</b>
Electro-Mechanical Technicians	8.1%	290
Engineering Technicians, Except Drafters, All Other	5.8%	100

To illustrate the acuteness of the qualified applicant shortage, numerous regional companies have contacted CoSCC looking for interns and/or employees from our EST program in the last few months including Tennessee Distilling LTD, JC Ford Company, TENNSCO, GCP Applied Technologies, Talos, Teledyne, and Universal Logic.

**SECTION 2. PROJECT PLAN**

**Overview**

We propose the establishment of the Columbia State Robotics Training Center, a transformative initiative aimed at remodeling an existing building on the CoSCC main campus in Columbia, TN, into a cutting-edge facility for robotics education. In partnership with Columbia Central High School and extending services to Marshall County Schools through the Spot Lowe Vocational Center and the successful GIVE 2.0 Mobile Classroom, this center will offer a robust curriculum leading to a new 1-year certificate and 2 new specializations. The first specialization in robotics will be complete with industry-recognized FANUC, SACA, and Cognex Vision Certifications, and one in Electrical Engineering Technology, a more theory-based degree option within EST. The robotics center will focus on hands-on in-demand training from the ground up. No

prior knowledge will be needed, and the student will graduate ready to work as a robotics technician in local or even national industry.

The students will work in 2 newly established labs, including a robotics lab, and an electronics lab. In the electronics lab, all basic electrical classes will be taught. Students will work with kits and laboratory equipment to learn to build, diagnose, and repair circuitry starting very basic and building up to designing and developing their own robotic systems. Emphasis will be placed on practical real-world examples and systems. New PLC trainers will teach the students to control the robots through industrial interfaces. This state-of-the-art lab will rival any university and be a boon to this program as well as the established Engineering Systems Technology curriculum. CoSCC physics can also use the lab for experiments in electricity. As the students progress through their learning, they will begin working in the new CoSCC Robotics Training lab. Here they will find 4 robot work cells in pairs of 2 which allow the student to set up mini manufacturing lines from scratch. The cells will have conveyors that feed items between them. Finally, the students will use Cobots outside the cells to retrieve the finished part and palatize it for shipping. In more advanced situations the cells can all be linked together to make a large assembly line. GM has previously and generously donated 3 large FANUC robots to the EST program, and these will be utilized both by allowing the students to program and troubleshoot industrial systems, but the third one will be kept ready for teardown and rebuilds. Our partners have each shared their preferred brands of robotic systems, and through this effort we have identified a need to keep the brands represented away from a single manufacturer. The robotic work cells will house Epson SCARA robots, the Cobots will be from Universal Robotics, and FANUC will be nicely represented with the stand-alone cells.

The initiative will fill critical skills gaps in our regional workforce, providing students with invaluable work-based learning experiences and internships while preparing them for high-demand

careers in robotics. Through this project, we commit to not only addressing immediate educational and workforce needs but also ensuring the program's long-term sustainability and adaptability to future industry trends. This grant is essentially a new program and significant improvements including expansion of a second one.

While this effort will be focused on for credit classes, CoSCC has a robust workforce development group that provides short term upskilling for employees at local companies. Workforce will be able to utilize this equipment during breaks in the normal school schedule to train local businesses. Once trained on a particular topic the employee will be given opportunities to articulate that credit on a particular class thus providing valuable recruiting opportunities into the full degree program.

Please see Appendix B for a full timeline with measures.

### **Governance and Accountability**

Governance and accountability for the grant will be primarily the responsibility of CoSCC and specifically, EST Program Director Daniel Garrett. Mr. Garrett personally will oversee the budget and order equipment. He will work with the CTE program directors in each school district, monitor work-based learning opportunities for students in the program, and will monitor student supports such as transportation and scheduling.

### **Work-Based Learning**

This grant proposal requests funding to increase the associated WBL opportunities and revisiting the current EST internship course, ENST 2391, to align with the *WBL Framework*. The internship does have a set of learning outcomes that align with both the curriculum and the WBL placement. Additionally, the course already requires interaction with both career professionals who supervise and assesses student proficiency within the context of the learning outcomes.

With this grant project, the internship would require exploration of student interests and alignment with academic program choice, ensuring there were multiple opportunities to explore different aspects of potential career and sufficient time to develop employability and career skills.

Each student would be required to manage an e-portfolio. With guidance from WBL Coordinator and faculty advisor, the student would populate his or her e-portfolio with evidence of learning (e.g., Employability Skills Checklist) and proficiency with requisite professional and employability skills and knowledge (e.g., self-assessment, reflection, work log). The TN WBL Implementation Guide will guide student experience. The students would also be required to post their gained experiences that show their understanding and reflection of the skills they gained as it relates to his or her interests and career goals.

At least one internship is a required credit course in the AAS in EST program. This means that 100% of the graduates will have had WBL opportunities when they graduate.

Further, WBL opportunities will be continued to be woven into the articulation agreements/curricular pathways. These WBL placements will require attendance at work site of at least 20 hours a week with a schedule that includes at least one full-day (8 hours). See Appendix C for Memorandum of Understanding from the industry partners. There will be flexibility in these requirements as the size and type of business of the industry partners varies greatly. Each employment site will provide supervision and evaluation of the student's performance and will report directly to CoSCC.

If a student is taking dual credit and dual enrollment courses toward their degree at CoSCC, then they can be placed at one of the industry partners. The students can complete their degree while still in high school or shortly after by completing the missing courses at CoSCC.

### **SECTION 3: STRENGTH OF PARTNERSHIPS**

Students participating in the EST program will benefit greatly from several existing partnerships, as well as new partnerships established for this grant project, including secondary and post-secondary articulations as well as WBL relationships with industry partners.

#### **K-12 Articulations**

CoSCC has existing articulations in EST for dual credit courses including EETC 1311 Electrical Circuit, EETC 2361 Fluid Power Systems, ENST 1360 Mechanical Power Transmission, and EETC 2361 Instrumentation Technology with Hickman County Schools, Lawrence County School System, Maury County Public Schools, and Marshall County Schools (Appendix F). Additional course articulations will be developed for the school systems new to this program. Once the students are in 11<sup>th</sup> and 12<sup>th</sup> they transition from dual credit to dual enrolled and are fully integrated into the CoSCC system. The EST program and some of the high schools have purchased equipment so that the high school students have access to the exact same trainers that are on the CoSCC main campus.

#### **Industry Partners**

CoSCC has existing industry partners where our regular students or our high school students have the opportunity for work-based learning as interns. Often, interns become employees, so our industry partners view our relationship as mutually beneficial. Additionally, Engineering System Technologies currently has an advisory board with members from local industries that guides the program to prepare students to meet the needs of manufacturing employers.

#### **Higher Education Institution**

Columbia State and Middle Tennessee State University have an existing partnership to establish a 1-year robotics certificate at CoSCC. MTSU faculty have committed to developing robotics modules that will help students prepare for industry certifications by bridging theoretical and

practical learning methods. These modules will be divided into three fundamental areas: assembling, programming, and troubleshooting. CoSCC will host and teach this new robotics education. The project will pair well with the existing curriculum at CoSCC and can easily be integrated into the 2-year Engineering Systems Technology program.

### **Memorandum of Understanding**

Memorandum of Understanding (MOUs) from the participating economic development organization, K-12 school districts, MTSU, and industry partners outlining the roles and responsibilities of each party are available in the Appendix C.

### **Additional Evidence of Strength of Support**

In 2021, the Engineering Systems Technology program at CoSCC was among the 10 colleges nationwide selected for the inaugural cohort of the Pathways to Innovation Business and Industry Leadership Team Academy (BILT). The BILT Academy will enhance CoSCC's interactions with local employers to address workforce needs of the communities we serve, and also provide the opportunity to design coursework that is well-matched to the current needs of businesses in the area.

In 2023, the EST program at CoSCC continued their support of Maury County Manufacturing Day. In this initiative, a joint alliance between CoSCC and the Maury County Chamber and Economic Alliance, businesses arrange for students from three high schools to visit their plants and learn about manufacturing. Around 150 students also visit CoSCC and learn how they can get job by continuing their academic careers by enrolling in postsecondary education.

### **SECTION 4: BUDGET PLAN**

The Budget Plan is shown in Appendix A. Detailed information about the costs associated with each budget line is also provided. To ensure that all project goals are met, indirect costs are included in the budget, which CoSCC may re-budget as cost contingencies, if necessary.

The capital equipment purchases detailed in Appendix A will be the basis for offering both certifications and the certificate and degree. Students will earn FANUC NOTIC certifications, SACA electrical certification, and Cognex Vision Pro Certifications making them very employable in Robotics Technician, Electrical Engineering Technician, and Industrial Engineering Technician Jobs. The capital expenditures will be spent on Universal Robotics Cobots, Robotic Work cells that include Epson Robots and PLCs, in support of these certificates and degree specializations. The graduates will be able to immediately enter high paying fields of robotics and electrical engineering technology filling the needs outlined in section 2.

### **SECTION 5: SUSTAINABILITY**

This program will be self-sustaining after the duration of the 48-month GIVE Grant period. The Advisory Board will be represented by members that support and are already committed to the expansion of engineering and engineering related educational opportunities. Additionally, funds to support this grant project after the conclusion of the grant will be available via the increase in the number of student enrollment. CoSCC is committed to continuing this program.

Students from the counties participating in this grant will be dual enrolled during their junior and senior years at the high school. The expected number of dual enrolled students in the AAS in Robotics Technician program and resulting revenues is based the grant proposal's target of an increase of 55 students annually that will attend college. This additional tuition revenue, approximately \$90,000 annually, will contribute support to this project after the conclusion of the 48-month GIVE 3.0 grant period.

Our industry partners have all agreed to continue to work with CoSCC on WBL in the future as they will need employees even after the 4-year grant period. The broad range of skills the students will receive in this program is going to lead to many employment opportunities and will lead to the program growing over time.



To assess the effectiveness of the program and to keep it updated we have a robust monitoring and evaluation framework guided by the Advisory Board. This will allow us to track enrollment numbers, feedback from industry partners, and employment outcomes in real time providing us the data needed to refine the program during the grant period and afterwards.

The EST department already has full time lab technician in order to maintain the equipment purchased by this grant. The building rehab will offer permanent space for the program to grow and thrive separate from the other specializations in EST.

## **SECTION 6: OPTIONAL CRITERIA**

### **High Demand Occupations**

This proposal includes implementation of Electrical Engineering Technology classes. These courses are aligned with the Electrical and Electronic Engineering Technologists Technicians (SOC: 17-3023) and Calibration Technologists and Technicians and Engineering Technologists (SOC: 17-3098), which are in high demand in the Southern Middle Tennessee Region.

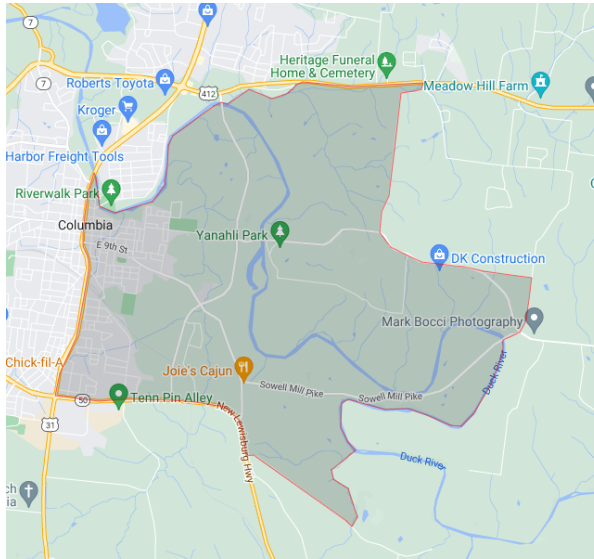
### **County Economic Status Acknowledgment**

This proposal seeks to serve students at Lewis County High School. Lewis County High School is in Lewis County, which is categorized as an at-risk county as measured by the ARC.

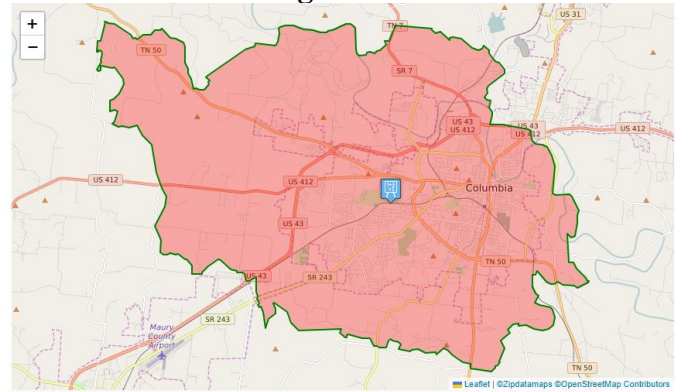
### **Census Tracts in Persistent Poverty**

This proposal seeks to serve students at Columbia Central High School. Columbia Central High School serves a high number of students residing within census tract 47119010500. Based on the U.S. Census Bureau's report, this tract is designated as being in persistent poverty.

### Census Tract 47119010500

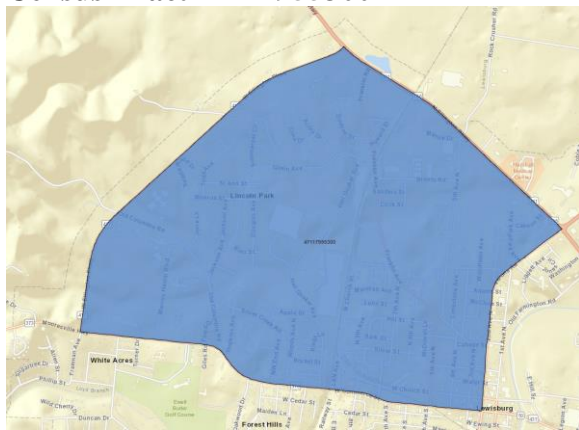


### Columbia Central High School Attendance Zone

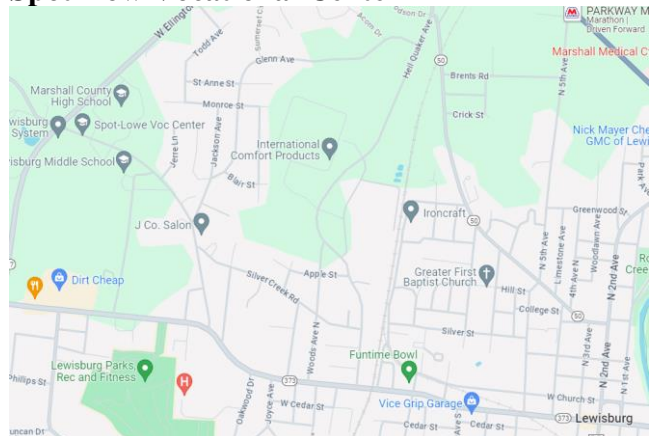


This proposal also seeks to serve students at Marshall County High School. Marshall County High School, located at 597 W Ellington Pkwy as well as Spot Low Technology center, located at 1771 Jason Maxwell Blvd, in Marshall County, TN are within census tract 47117955300. Based on the U.S. Census Bureau's report, this tract is designated as being in persistent poverty.

### Census Tract 47117955300



### Location of Marshall County High School and Spot-Low Vocational Center



**Appendix A – Budget**

<b>GRANT BUDGET</b>				
<b>GIVE Program Competitive Grant – Columbia State Robotics Training Center</b>				
<b>The grant budget line-item amounts below shall be applicable only to expenses incurred during the following Applicable Period:      BEGIN: 9/1/24      END: 8/31/28</b>				
<b>POLICY 03 Object Line-item Reference</b>	<b>EXPENSE OBJECT LINE-ITEM CATEGORY <sup>1</sup></b>	<b>GRANT CONTRACT</b>	<b>GRANTEE PARTICIPATION</b>	<b>TOTAL PROJECT</b>
1, 2	Salaries, Benefits & Taxes	\$616,000	0.00	\$616,000
4, 15	Professional Fee, Grant & Award <sup>2</sup>	\$759,352	0.00	\$759,352
5, 6, 7, 8, 9, 10	Supplies, Telephone, Postage & Shipping, Occupancy, Equipment Rental & Maintenance, Printing & Publications	\$126,500	0.00	\$126,500
11, 12	Travel, Conferences & Meetings	\$30,000	0.00	\$30,000
13	Interest <sup>2</sup>	0.00	0.00	0.00
14	Insurance	0.00	0.00	0.00
16	Specific Assistance to Individuals	\$10,000	0.00	\$10,000
17	Depreciation <sup>2</sup>	0.00	0.00	0.00
18	Other Non-Personnel <sup>2</sup>	0.00	0.00	0.00
20	Capital Purchase <sup>2</sup>	\$310,000	0.00	\$310,000
22	Indirect Cost	\$148,148	0.00	\$148,148
24	In-Kind Expense	0.00	0.00	0.00
25	<b>GRAND TOTAL</b>	<b>\$2,000,000</b>	<b>0.00</b>	<b>\$2,000,000</b>

**Item Detail:**

	<u>Qty</u>	<u>Amount</u>	<u>Line</u>	<u>Category</u>
<b>Building Renovation/Lab Move</b>	1	\$663,352.00	\$663,352	Professional Fee
<b>Furniture</b>	1	\$35,000.00	\$35,000	Supplies
<b>Universal Robotics Cobots</b>	2	\$45,000.00	\$90,000	Capital
<b>Move GM FANUC Robots</b>	2	\$15,000.00	\$30,000	Professional Fee
<b>Robot Work Cells</b>	4	\$10,000.00	\$40,000	Capital
Includes PLC, Power Supplies Conveyer Systems, HMIs Software, Webcam, Setup Epson T3 SCARA Robot				
	4	\$7,500.00	\$30,000	Capital
<b>Computers</b>	20	\$2,000.00	\$40,000	Supplies
<b>Cognex Deep Learning AI cameras</b>	15	\$10,000.00	\$150,000	Capital
<b>Electronics Workstations</b>				
Oscilloscope	11	\$500.00	\$5,500	Supplies
Digital Multimeter	11	\$750.00	\$8,250	Supplies
DC Power Supply	11	\$750.00	\$8,250	Supplies
Function Generators	11	\$500.00	\$5,500	Supplies
Soldering Kits	20	\$200.00	\$4,000	Supplies
<b>Electronics Project Kits and Components</b>	1	\$10,000.00	\$10,000	Supplies
<b>Robot Project Kits and Components</b>	1	\$10,000.00	\$10,000	Supplies
<b>PLC Workstations</b>	12	\$3,500	\$42,000	Supplies
<b>Full Time Instructor Salary and Benefits (4 years)</b>	2	\$308,000.00	\$616,000	Salaries, Benefits, Taxes Travel, Conferences, & Meetings
<b>Faculty Training</b>	6	\$5,000.00	\$30,000	Conferences, & Meetings
<b>Advertising</b>	1	\$24,000.00	\$24,000	Professional Fee
<b>Transportation for Students</b>	1	\$10,000.00	\$10,000	Specific Assistance to Individuals
<b>Direct Costs</b>			\$1,851,852	
<b>Total</b>				
<b>Indirect Cost (8%)</b>			\$148,148	
<b>Total</b>			\$2,000,000	

**Appendix B – Timeline and Measures**

<b>Year</b>	<b>Activity</b>	<b>Measure</b>
Year 1	<b><u>Summer 24</u></b>	
	Begin hiring process for new faculty members	2 Faculty Hired
	Begin advisory board for new program	New advisory board of interested companies, agencies, students, faculty, PLOs established
	Begin curriculum development	First 2 classes established
	Begin work with CoSCC facilities for building rehab.	Facilities has plan for building rehab
	<b><u>Fall 24</u></b>	
	Continue Curriculum development	Next 2 classes established
	Purchasing round 1 for lab items	Electrical lab equipment for early curriculum, computers, electronic and robotics kits purchased
	Begin advertising campaign	Local advertising to get first students
	Advisory board meeting	Fall meeting to update and continue planning
	Faculty onboarding and training	Faculty are certified to give FANUC, SACA, and Cognex certifications
	Continue planning and bidding on building rehab	Plans established and bidding has begun
	<b><u>Spring 25</u></b>	
	High schools begin with curriculum	Students are either bussed over or the GIVE 2.0 Mobile Classroom is leveraged for schools further away
First classes begin in borrowed space on CoSCC Campus	First students begin, goal 10 students	
Finalize building rehab plans and bids	Bidding finalized	
Continue Curriculum development	Next 2 classes established	
Advisory board meeting	Spring meeting to update and continue planning	
Purchasing round 2 for lab items	PLC workstations purchased	
Year 2	<b><u>Summer 25</u></b>	
	WBL opportunities available for students	GCP, Landmark Ceramics, and Talos have generously offered to intern our students
	Continue Curriculum development	Next 2 classes established
	Get bids for Purchasing round 3	Bidding for robotic work cells and cobots
	<b><u>Fall 25</u></b>	
	Advisory board meeting	Fall meeting to update and continue planning. First students asked to join advisory board.
	Next round of classes begins	Students continue their classes
	Purchasing round 3 for lab items	Robotic work cells and cobots purchased
	Full curriculum passed to curriculum committee then TBR	All paperwork applied for full curriculum
	Building rehab begins	Building under renovation
Take bids on Purchasing round 4	Bidding for Cognex advanced AI cameras	
Notify ATMAE of new program	Follow ATMAE procedure	

	<p>First students are SACA certified</p> <p><b><u>Spring 26</u></b>          Full advertising blitz          Advisory board meeting          Purchasing round 4 for lab items</p> <p>First students FANUC certified</p> <p>Students get Cognex Vision certified</p> <p>Building rehab continues</p>	<p>Begin and maintain an 80% pass rate on the SACA C-201 electrical exam</p> <p>Full round of advertising to entice Fall 26 students          Spring meeting to update and continue planning          Cognex advanced AI cameras purchased          Begin and maintain an 80% pass rate on the FANUC NOCTI Certifications          Begin and maintain an 80% pass rate on the Cognex Vision Pro Certifications          Building under renovation</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Year 3</p>	<p><b><u>Summer 26</u></b>          Curriculum development</p> <p><b><u>Fall 26</u></b>          First large cohort          Advisory board meeting          Building rehab continues          Program's First Graduates          Mandatory reporting to TBR</p> <p><b><u>Spring 27</u></b>          Building rehab finalizes          Advisory Board Meeting</p>	<p>Next 2 classes established. Lessons learn from first students applied to existing classes.</p> <p>Goal of adding 30 new students to the program          Fall meeting to update. Lessons learned. Student progress detailed. Newest students invited.          Building under renovation          Establish a rate of first-time student graduations          Report graduation, retention, and employment numbers to TBR</p> <p>Building under renovation          Spring meeting to update, graduates that are willing continue on advisory board</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Year 4</p>	<p><b><u>Summer 27</u></b>          Move all equipment to newly renovated building          Curriculum development</p> <p><b><u>Fall 27</u></b>          Advisory board meeting          Mandatory reporting to TBR          Classes begin in newly renovated building!</p> <p><b><u>Spring 28</u></b>          Advisory board meeting          Full Reports submitted to GIVE Grant          Faculty moved to CoSCC System</p>	<p>Summer move is preferable due to lower enrollment          Apply lessons learned to continue improving classes</p> <p>Fall meeting to update.          Report graduation, retention, and employment numbers to TBR          New labs are given a full press blitz to drive additional numbers</p> <p>Spring meeting to update.          Full reports including future projections given to GIVE Grant          Based on numbers hit, Faculty offered continuing positions at CoSCC</p>

**Appendix C – Memorandum of Understanding**

Workforce/Economic Development Agencies:

- Maury County Chamber & Economic Alliance
- Lawrence County Chamber of Commerce

Higher Education Institute:

- Middle Tennessee State University

LEA/School Districts:

- Maury County Public Schools
- Marshall County Schools
- Hickman County Schools
- Lawrence County School System
- Lewis County Schools

Employer Partners:

- GCP Applied Technologies
- Landmark Ceramics
- Talos Engineered Products

DATE: April 22, 2024

RE: Columbia State Community College 2024 TN GIVE 3.0 Grant Proposal

This document attests Maury Alliance support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center.

Upon the awarding of TN GIVE Grant funds associated with this grant project and THEC approval, Maury Alliance will help to endorse the networking opportunities among the TN GIVE Grant educational and industry partners.

The Maury Alliance is especially interested in supporting this application as we frequently receive feedback from local advanced manufacturers regarding the need for more robust and aligned middle skills training programs to support the growth of their industries. In Maury County, twenty percent of the workforce is engaged in manufacturing, a percentage more than double the national average. According to EMSI, job growth in Maury County increased 12.4 % between 2018 and 2023, greatly outpacing the national average of 3.6%. Furthermore, with over 3,500 new jobs and almost \$5 billion worth of new capital investment announced since 2020, we anticipate Maury County to remain an engine for Tennessee's manufacturing growth into the foreseeable future. As part of the support, Maury Alliance also acknowledges the 48-month duration of the grant period of September 1, 2024 - August 31, 2028 and agrees to work with Columbia State within that TN GIVE Grant period.

The Maury Alliance greatly appreciates the opportunity to partner with Columbia State Community College in support of this critically important effort.

Maury Alliance:



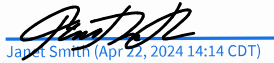
4/8/24

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Travis Groth, Vice President — Economic Development

Date

Columbia State Community College:

  
Janet Smith (Apr 22, 2024 14:14 CDT)

Apr 22, 2024

---

Janet F. Smith, Ph.D., President

Date



DATE: April 26, 2024

RE: Columbia State Community College 2024 TN GIVE 3.0 Grant Proposal

The Lawrence County Chamber of Commerce is a network of businesses, industries, local governments, and private citizens who are committed to improving the quality of life in and around Lawrence County through economic, tourism, workforce, and retail development.

This document attests the Lawrence County Chamber of Commerce's support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center.

Upon the awarding of TN GIVE Grant funds associated with this grant project and THEC approval, the Lawrence County Chamber of Commerce will help to endorse the networking opportunities among the TN GIVE Grant educational and industry partners.

As part of the support, the Lawrence County Chamber of Commerce also acknowledges the 48-month duration of the grant period of September 1, 2024 - August 31, 2028 and agrees to work with Columbia State within that TN GIVE Grant period.

The Lawrence County Chamber of Commerce greatly appreciates the opportunity to partner with Columbia State Community College in support of this critically important effort.

Lawrence County Chamber of Commerce:



Ryan Egly, President and CEO

4/29/2024

Date

Columbia State Community College:



Janet F. Smith (Apr 26, 2024 13:37 CDT)

Janet F. Smith, Ph.D., President

Apr 26, 2024

Date

MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College (CSCC) AND Middle Tennessee State University (MTSU)  
TN GIVE 3.0 Grant: Columbia State Robotics Training Center  
September 1, 2024 - August 31, 2028

This document attests MTSU support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center. Upon the awarding of TN GIVE Grant funds associated with this proposal and THEC approval, MSTU agrees to the following:

1. Offer Dr. Jorge Vargas's expertise in robotic systems and Engineering to aid in curriculum development and guidance. Dr. Vargas is a professor in the Engineering Technology department of MTSU.

Specifically, the MTSU will:

- a. Attend Advisory Board Meetings.
- b. Help CSCC establish program learning outcomes (PLO)s that meet the program objectives.
- c. Review materials that are proposed for the classes to be written.
- d. Give guidance in purchase of equipment, lab setup, lab layouts.
- e. Propose useful real-world projects that benefit the students.

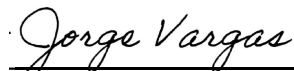
2. MTSU will work with CSCC toward an articulation agreement for this program.

Both MTSU and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on September 1, 2024 and ending on August 31, 2028. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**MTSU:**



Jorge Vargas, Ph.D., Associate Professor

04/26/24

Date

**Columbia State Community College:**

  
Janet F. Smith (Apr 26, 2024 13:37 CDT)

Janet F. Smith, Ph.D., President

Apr 26, 2024

Date

MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND Maury County Public Schools  
TN GIVE 3.0 Grant: Columbia State Robotics Training Center  
September 1, 2024 - August 31, 2028

This document attests Maury County Public Schools support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center. Upon the awarding of TN GIVE Grant funds associated with this proposal and THEC approval, Maury County Public Schools agrees to the following:

1. Participation of at least one High School Teacher in Technical training and other activities put forth in the grant.
2. A representative designated by Maury County Public Schools will serve on the Community Based Advisor for this grant.
3. Students will be taking dual credit courses based on an articulation between Columbia State Community College and Maury County Public Schools.
4. Students will take dual enrollment course using the Columbia State Robotics Training Center.
5. Work with Columbia State faculty in the placement of 12<sup>th</sup> grade Engineering Systems Technology (EST) students into WBL placements provided as a result of TN GIVE 3.0 Grant funding.
6. Attendance of at least one high school CTE teacher or CTE Director at one of four designated conferences. (Attendance funded by this TN GIVE 3.0 Grant.)

Both the Maury County Public Schools and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This agreement shall be effective for the period commencing on September 1, 2024 and ending on August 31, 2028. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Maury County Public Schools:**



Date

4/8/2024

**Columbia State Community College:**

  
Janet F. Smith (Apr 22, 2024 14:14 CDT)

Janet F. Smith, Ph.D., President

Date

Apr 22, 2024

MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND Marshall County Schools  
TN GIVE 3.0 Grant: Columbia State Robotics Training Center  
September 1, 2024 - August 31, 2028

This document attests Marshall County Schools support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center. Upon the awarding of TN GIVE Grant funds associated with this proposal and THEC approval, Marshall County Schools agrees to the following:

1. Participation of at least one High School Teacher in Technical training and other activities put forth in the grant.
2. A representative designated by Marshall County Schools will serve on the Community Based Advisor for this grant.
3. Students will be taking dual credit courses based on an articulation between Columbia State Community College and Marshall County Schools.
4. Students will take dual enrollment course using the Columbia State Robotics Training Center.
5. Work with Columbia State faculty in the placement of 12<sup>th</sup> grade Engineering Systems Technology (EST) students into WBL placements provided as a result of TN GIVE 3.0 Grant funding.
6. Attendance of at least one high school CTE teacher or CTE Director at one of four designated conferences. (Attendance funded by this TN GIVE 3.0 Grant.)

Both the Marshall County Schools and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This agreement shall be effective for the period commencing on September 1, 2024 and ending on August 31, 2028. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

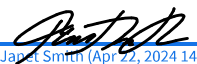
IN WITNESS WHEREOF:

**Marshall County Schools:**

  
\_\_\_\_\_  
Jacob Sorrells, Director of Schools

4-8-24  
\_\_\_\_\_  
Date

**Columbia State Community College:**

  
\_\_\_\_\_  
Janet F. Smith, Ph.D., President

Apr 22, 2024  
\_\_\_\_\_  
Date

MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND Hickman County Schools  
TN GIVE 3.0 Grant: Columbia State Robotics Training Center  
September 1, 2024 - August 31, 2028

This document attests Hickman County Schools support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center. Upon the awarding of TN GIVE Grant funds associated with this proposal and THEC approval, Hickman County Schools agrees to the following:

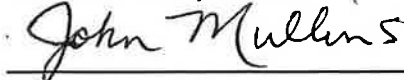
1. Participation of at least one High School Teacher in Technical training and other activities put forth in the grant.
2. A representative designated by Hickman County Schools will serve on the Community Based Advisor for this grant.
3. Students will be taking dual credit courses based on an articulation between Columbia State Community College and Hickman County Schools.
4. Students will take dual enrollment course using the Columbia State Robotics Training Center.
5. Work with Columbia State faculty in the placement of 12<sup>th</sup> grade Engineering Systems Technology (EST) students into WBL placements provided as a result of TN GIVE 3.0 Grant funding.
6. Attendance of at least one high school CTE teacher or CTE Director at one of four designated conferences. (Attendance funded by this TN GIVE 3.0 Grant.)

Both the Hickman County Schools and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This agreement shall be effective for the period commencing on September 1, 2024 and ending on August 31, 2028. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Hickman County Schools:**

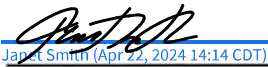


John Mullins, Director of Schools

4 - 2 - 24

Date

**Columbia State Community College:**

  
Janet F. Smith (Apr 22, 2024 14:14 CDT)

Janet F. Smith, Ph.D., President

Apr 22, 2024

Date

**MEMORANDUM OF UNDERSTANDING BETWEEN**  
**Columbia State Community College AND Lawrence County School System**  
**TN GIVE 3.0 Grant: Columbia State Robotics Training Center**  
**September 1, 2024 - August 31, 2028**

This document attests Lawrence County School System support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center. Upon the awarding of TN GIVE Grant funds associated with this proposal and THEC approval, Lawrence County School System agrees to the following:

1. Participation of at least one High School Teacher in Technical training and other activities put forth in the grant.
2. A representative designated by Lawrence County School System will serve on the Community Based Advisor for this grant.
3. Students will be taking dual credit courses based on an articulation between Columbia State Community College and Lawrence County School System.
4. Students will take dual enrollment course using the Columbia State Robotics Training Center.
5. Work with Columbia State faculty in the placement of 12<sup>th</sup> grade Engineering Systems Technology (EST) students into WBL placements provided as a result of TN GIVE 3.0 Grant funding.
6. Attendance of at least one high school CTE teacher or CTE Director at one of four designated conferences. (Attendance funded by this TN GIVE 3.0 Grant.)

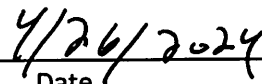
Both the Lawrence County School System and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This agreement shall be effective for the period commencing on September 1, 2024 and ending on August 31, 2028. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

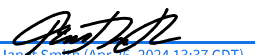
IN WITNESS WHEREOF:

**Lawrence County School Systems:**

  
\_\_\_\_\_  
Michael Adkins, Director of Schools

  
\_\_\_\_\_  
Date

**Columbia State Community College:**

  
\_\_\_\_\_  
Janet Smith (Apr 26, 2024 13:37 CDT)  
Janet F. Smith, Ph.D., President

Apr 26, 2024  
\_\_\_\_\_  
Date

MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND Lewis County Schools  
TN GIVE 3.0 Grant: Columbia State Robotics Training Center  
September 1, 2024 - August 31, 2028

This document attests Lewis County Schools support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center. Upon the awarding of TN GIVE Grant funds associated with this proposal and THEC approval, Lewis County Schools agrees to the following:

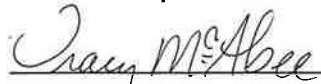
1. Participation of at least one High School Teacher in Technical training and other activities put forth in the grant.
2. A representative designated by Lewis County Schools will serve on the Community Based Advisor for this grant.
3. Students will be taking dual credit courses based on an articulation between Columbia State Community College and Lewis County Schools.
4. Students will take dual enrollment course using the Columbia State Robotics Training Center.
5. Work with Columbia State faculty in the placement of 12<sup>th</sup> grade Engineering Systems Technology (EST) students into WBL placements provided as a result of TN GIVE 3.0 Grant funding.
6. Attendance of at least one high school CTE teacher or CTE Director at one of four designated conferences. (Attendance funded by this TN GIVE 3.0 Grant.)

Both the Lewis County Schools and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This agreement shall be effective for the period commencing on September 1, 2024 and ending on August 31, 2028. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Lewis County Schools:**

  
\_\_\_\_\_

Dr. Tracy McAbee, Director of Schools

4-3-24

\_\_\_\_\_ Date

**Columbia State Community College:**

  
\_\_\_\_\_

Janet F. Smith, Ph.D., President

Apr 22, 2024

\_\_\_\_\_ Date

MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND GCP  
TN GIVE 3.0 Grant: Columbia State Robotics Training Center  
September 1, 2024 - August 31, 2028

This document attests GCP support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center. Upon the awarding of TN GIVE Grant funds associated with this proposal and THEC approval, GCP agrees to the following:

1. Offer at least one work-based learning (WBL) experiences for Columbia State Engineering Systems Technology students associated with this grant. The WBL students will be hired through State of Tennessee Work Force Development (WFD). Due to the nature of the work, any student hired at the GCP facility must be 18 years of age or older and must be able to perform minimum job qualifications.

Specifically, the WBL will:

- a. Be at least for 180 hours.
- b. It will be a paid work experience with a suggested starting hourly pay rate of at least \$12.50.
- c. Students will work for a minimum of 20 hours a week with at least one full day (e.g., 8 hours).
- d. Grant may reimburse up to 50% of the hourly pay rate.
- e. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular intervals.
- f. Practice and demonstrate proficiency of knowledge & skills that typically performed by a permanent professional in field, demonstrate ability to solve real work problems in a typical work setting, and participate in professional development or opportunities to build on these skills.
- g. Will allow scheduled site visits of the WBL Coordinator to evaluate student in work setting.

2. A representative designated by GCP could serve on the Community Based Advisor for this grant.

Both GCP and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on September 1, 2024 and ending on August 31, 2028. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

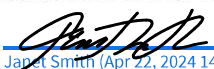
IN WITNESS WHEREOF:

GCP:

  
Willfam Wade, Plant Manger

4-16-24  
Date

Columbia State Community College:

  
Janet Smith (Apr 22, 2024 14:14 CDT)  
Janet F. Smith, Ph.D., President

Apr 22, 2024  
Date



MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND Landmark Ceramics  
TN GIVE 3.0 Grant: Columbia State Robotics Training Center  
September 1, 2024 - August 31, 2028

This document attests Landmark Ceramics support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center. Upon the awarding of TN GIVE Grant funds associated with this proposal and THEC approval, Landmark Ceramics agrees to the following:

1. Offer at least one work-based learning (WBL) experiences for Columbia State Engineering Systems Technology students associated with this grant. The WBL students will be hired through State of Tennessee Work Force Development (WFD).

Specifically, the WBL will:

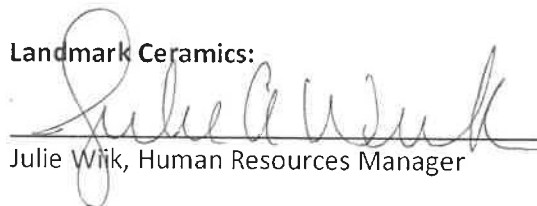
- a. Be at least for 180 hours.
  - b. It will be a paid work experience with a suggested starting hourly pay rate of at least \$12.50.
  - c. Students will work for a minimum of 20 hours a week with at least one full day (e.g., 8 hours).
  - d. Grant may reimburse up to 50% of the hourly pay rate.
  - e. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular intervals.
  - f. Practice and demonstrate proficiency of knowledge & skills that typically performed by a permanent professional in field, demonstrate ability to solve real work problems in a typical work setting, and participate in professional development or opportunities to build on these skills.
  - g. Will allow scheduled site visits of the WBL Coordinator to evaluate student in work setting.
2. A representative designated by Landmark Ceramics could serve on the Community Based Advisor for this grant.

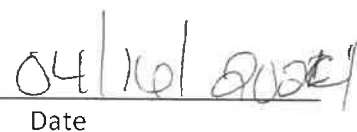
Both Landmark Ceramics and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on September 1, 2024 and ending on August 31, 2028. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.


IN WITNESS WHEREOF:

**Landmark Ceramics:**

  
Julie Wijk, Human Resources Manager

  
Date

**Columbia State Community College:**

  
Janet Smith (Apr 22, 2024 14:14 CDT)  
Janet F. Smith, Ph.D., President

Apr 22, 2024  
Date

MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND TALOS Engineered Products  
TN GIVE 3.0 Grant: Columbia State Robotics Training Center  
September 1, 2024 - August 31, 2028

This document attests TALOS Engineered Products support of Columbia State Community College's 2024 TN GIVE 3.0 Grant, Columbia State Robotics Training Center. Upon the awarding of TN GIVE Grant funds associated with this proposal and THEC approval, TALOS Engineered Products agrees to the following:

1. Offer at least one work-based learning (WBL) experiences for Columbia State Engineering Systems Technology students from Spot-Lowe Technology Center associated with this grant. The WBL students will be hired through State of Tennessee Work Force Development (WFD).

Specifically, the WBL will:

- a. Be at least for 180 hours.
  - b. It will be a paid work experience with a suggested starting hourly pay rate of at least \$12.50.
  - c. Students will work for a minimum of 20 hours a week with at least one full day (e.g., 8 hours).
  - d. Grant may reimburse up to 50% of the hourly pay rate.
  - e. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular intervals.
  - f. Practice and demonstrate proficiency of knowledge & skills that typically performed by a permanent professional in field, demonstrate ability to solve real work problems in a typical work setting, and participate in professional development or opportunities to build on these skills.
  - g. Will allow scheduled site visits of the WBL Coordinator to evaluate student in work setting.
2. A representative designated by TALOS Engineered Products could serve on the Community Based Advisor for this grant.

Both TALOS Engineered Products and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on September 1, 2024 and ending on August 31, 2028. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**TALOS Engineered Products:**



Marie LaLonde, Vice President of People and Culture



Date

**Columbia State Community College:**



[Janet Smith \(Apr 22, 2024 14:14 CDT\)](#)

Janet F. Smith, Ph.D., President

Apr 22, 2024

Date

**Appendix D – Programs of Study**

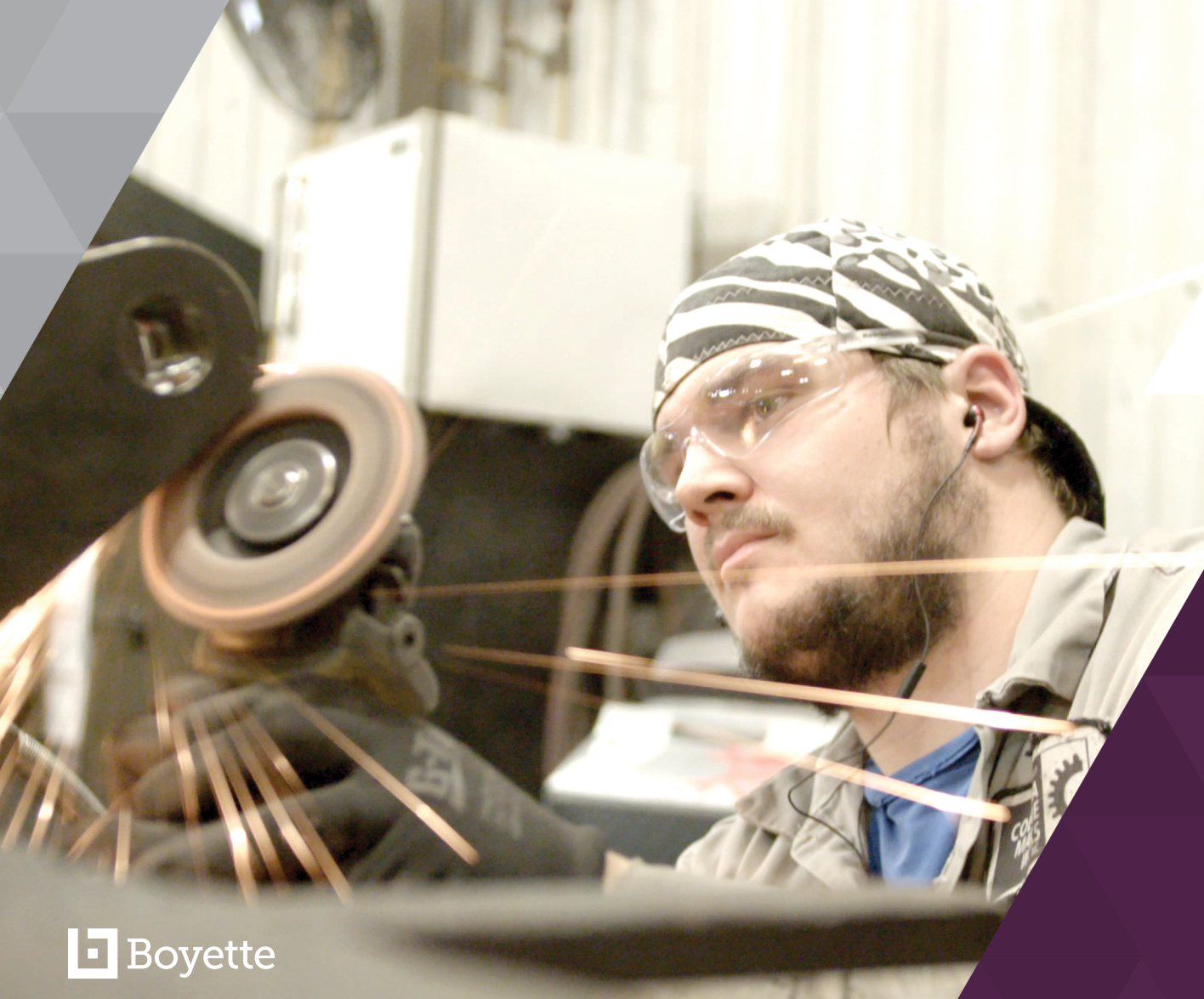
The current EST degree would have specializations added to accommodate a student’s chosen career pathway. The current degree would effectively be split into the EST and Mechatronics specializations while the Electrical Engineering Technology and Robotics Technology would be completely new.

<b><u>General Education Requirement</u></b>		<b><u>Engineering Systems Core</u></b>	
3	ENGL 1010 English Comp I	3	ENST 1370 Manufacturing Processes
3	Choice Humanities and Fine Art	3	ENST 1311 Computer Aided Design I
4	PSCI 1030 Survey of Physical Science	3	ENST 1350 Industrial Safety
3	MATH 1130 College Algebra	3	INFS 1010 Computer Applications
3	MATH 1720 Trigonometry	3	EETC 2291 Internship
3	Choice Social Behavioral Science	3	EETC 2333 Industrial Electronic Control
1	COLS 101 College Success	3	EETC 2331 PLC I
20		21	
<b><u>Specializations:</u></b>			
<b><u>Engineering Systems Technology</u></b>		<b><u>Mechatronics Technology</u></b>	
3	EETC 1311 Electrical Circuits I	3	EETC 1311 Electrical Circuits I
3	ENST 1360 Mechanical Power Transmission	3	EETC 1331 Digital Fundamentals
3	ENST 2361 Fluid Power	3	ENST 2361 Fluid Power
3	ENST 2362 Total Productive Maintenance	3	EETC 2361 Instrumentation Technology
3	ENST 2370 Statics and Strength of Materials	3	EETC 2350 Integrated Robotics
3	ENST 1340 Machine Tool Technology	3	ENST 2399 Special Topics Robotics
3	ENST 2399 Advanced Class	3	ENST 2382 Mechatronics
21		21	
<b><u>Electrical Engineering Technology</u></b>		<b><u>Robotics Technology</u></b>	
3	EETC 1313 DC Circuits	3	EETC 1311 Electrical Circuits I
3	EETC 1314 AC Circuits	3	Mech 1350 Industrial Robots
3	EETC 1331 Digital Fundamentals	3	ENST 2361 Fluid Power
3	EETC 1321 Electronics I	3	Mech 2710 Robotics Safety and Operation
3	EETC 2371 Microprocessor Based Control Systems	3	Mech 2720 Robotic Design and Maintenance
3	EETC 2361 Instrumentation Technology	3	EETC 2399 Special Topics Robotics
3	EETC 2311 Power Technology	3	MECH 2382 Mechatronics
21		21	
<b>62 Total Hours</b>			

**Appendix E - "Align Maury: Building Tomorrow's Talent Today"**

**Workforce Alignment Study Executive Summary**

**Maury County Chamber and Economic Alliance/Boyette Strategic Advisors**



# ALIGN MAURY

BUILDING TOMORROW'S TALENT TODAY

## Workforce Alignment Study

### Executive Summary



The Maury County Chamber and Economic Alliance (Alliance) engaged Boyette Strategic Advisors (Boyette) to complete a workforce assessment and alignment process to ensure that workforce resources are used efficiently and effectively to provide a future talent pipeline for Maury County employers. The ultimate goal of the project was to create a thoughtfully developed local delivery system that maximizes resources and results in a more highly skilled, competitive workforce.

Through analyzing a 60-minute drive time from Maury County and zip code data provided by Maury County employers, a nine-county Labor Market Area was defined to include Davidson, Giles, Hickman, Lawrence, Lewis, Marshall, Maury, Rutherford, and Williamson Counties, as seen in the map to the right.

#### Maury Labor Market Area



## PROJECT GOALS

The following specific project goals were identified as this project began:

- Identify training program gaps
- Assess talent & skills demand for existing employers and potential growth sectors
- Ensure a diverse workforce that supports business recruitment
- Strengthen relationships between employers & workforce partners
- Align workforce resources with skills & occupational demand
- Create on-going task force to convene around workforce opportunities and challenges

## ASSET MAPPING

An asset mapping process was used to explore the overall workforce delivery system in Maury County. That exercise identified assets in the following categories:

- Connective Organizations – Business Services & Conveners
- Supportive Organizations – Outreach & Public Assistance
- Employment Services – Career Services & System Infrastructure
- Human Capital – Talent Development & Comprehensive Services

## KEY FINDINGS

- Employers are generally very satisfied with workforce skills found in Maury County, with 70 percent of employers being satisfied or very satisfied with the employees they hire in Maury County
- While employers believe the cost of labor is about right or less expensive compared to quality, availability is an issue for many
- Both total population and labor force continue to grow in the nine-county labor market region.
- Perceptions about careers in manufacturing and the skilled trades are somewhat negative, particularly among students
- Opportunities exist to strengthen relationships between employers and educators
- Barriers to employment are limited in the region, with childcare presenting the greatest challenge to employment for residents
- There are opportunities for better alignment of CTE courses at the high school level with compatible programs at CSCC and the TCATs, particularly related to manufacturing and information technology
- While a lack of attainable housing is often cited as a workforce issue, that is not the case in Maury County, where a significant number of new homes are under development and where available housing currently matches the needs of families living in or considering a move to the region

## WORKFORCE PROFILE

---

**8%**

POPULATION GROWTH (2015-2020)

**831,398**

LABOR FORCE

**\$65,305**

MEDIAN HOUSEHOLD INCOME

**68.08%**

LABOR PARTICIPATION RATE

**37.0**

MEDIAN AGE

**26.6** MIN

COMMUTE TIME

**44%**

ASSOCIATE'S DEGREE +

---

## SKILLS GAPS

Data analysis and stakeholder input for this project identified a number of skills and/or training gaps that exist in the Maury County workforce. These range from a lack of experience with basic office computer software to a need for increased leadership skills at all levels of the workforce. The most commonly discussed skills deficit in the Maury County workforce involves leadership skills. However, in further conversations, it is clear that employers are not referring to senior-level management roles but believe that leadership skills are important and valuable across all sectors and all levels of responsibility.

### CURRENT SKILLS GAPS

- Customer Service Representatives
- Assemblers & Fabricators
- Production Supervisors
- Inspectors, Testers, Sorters, Samplers & Weighers
- Welders
- Industrial Machinery Mechanics
- Bookkeepers
- Registered Nurses
- Leadership – All Levels
- General IT Skills
- Excel

### POTENTIAL FUTURE GAPS

- Information Technology
  - Cybersecurity
  - Logistics
  - Manufacturing Technology
- Biochemists
- Biophysicists
- Biological Technicians

## TARGET DATA

Target sector data was also defined and analyzed for the workforce alignment study, in addition to data for additional sectors that may provide future opportunities for job creation and investment. . The table below provides data for Maury County's opportunity sectors.

Industry	2020 Jobs	2025 Jobs	Percent Change	Average Earnings
Advanced Manufacturing	1,263	1,477	17%	\$67,897
Automotive	4,216	4,400	4%	\$104,004
Ceramics	48	56	18%	\$51,277
Healthcare	6,701	7,739	15%	\$64,652
Headquarters	205	142	-31%	\$105,862
Medical Device Manufacturing	<10	<10	0%	--
Metal Fabrication	402	453	13%	\$61,779
Plastics	257	296	15%	\$64,080
Production Technology	99	107	8%	\$77,649
Research & Development	>10	<10	0%	--

Source: EMSI, Class of Worker Data, 2020.4

## STAKEHOLDER ENGAGEMENT

The workforce alignment study included interviews with employers, educators, and workforce partners, in addition to focus groups with post-secondary students and job seekers. Almost 50 individual stakeholders participated in those discussions, along with more than 1,100 stakeholders across Maury County who provided input into this project through a series of online surveys.

Survey Audience	Responses
Employers	126
Residents/Job Seekers	408
High School Students	354
Post-Secondary Students	165
High School Counselors	9
<b>TOTAL</b>	<b>1,062</b>

# RECOMMENDATIONS

The recommended strategies that were informed by the research and data analytics are intended to encourage collaboration among all components of the workforce system, which will improve Maury County's competitive position in job creation and capital investment. The full workforce alignment study provides detailed explanation of each recommendation with and includes action items and best practice examples.

## Aligning Resources

### *Create an ALIGN Workforce Team*

- Establish the ALIGN Team
- Identify Resources & Funding
- Create a Workforce Position at the Maury County Chamber and Economic Alliance

### *Enhance Partnerships to Maximize Resources*

- Bring together workforce resources to facilitate more collaboration
- Move forward with development of a regional technology center
- Establish a one-stop approach to delivering workforce training and supportive services
- Develop a business training consortium
- Convene a business & industry workforce forum

## Educating for Opportunities

### *Expand Work-Based Learning Programs at All Levels*

- Establish an ALIGN internship program
- Create an apprenticeship program for high-demand middle-skill occupations
- Create workplace exposure opportunities for educators

### *Address Skills & Training Gaps of the Workforce*

- Create a Business Excellence Academy
- Establish a logistics and cybersecurity program
- Develop a partnership for an RN to BSN program
- Reframe manufacturing by showcasing high-demand occupations
- Explore the impact of automation on the future workforce

### *Mobilize Community Leaders to Address K-12 Education Needs*

- Work with Maury County School District leadership to identify needs and determine how the broader community can support needed improvements
- Incorporate promoting K-12 education successes into all community-focused social media platforms

## Recruiting Talent

### *Develop Diversity, Equity & Inclusion Initiatives That Engage And Support Minority Communities*

- Create a task force of minority leaders
- Explore the creation of a Leadership Institute offering focused on Diversity, Equity & Inclusion issues
- Ensure equitable entrepreneurial and start-up support services
- Capture, promote, and highlight successes

### *Position Maury County as the South Central Tennessee Talent Hub*

- Launch a campaign to promote the new branding effort focused on establishing Maury County as an innovative talent hub
- Create a livability brochure
- Develop a "fam tour" for recruiting talent
- Develop an interactive map of the tour route
- Highlight Maury County employers that are hiring
- Focus recruitment efforts on young families

## Engaging the Workforce

### *Expand & Enhance Re-entry Programs*

- Create a Military Transition Assistance Toolkit
- Work with employers to develop military occupation crosswalks
- Develop a "returnship" program
- Explore the development of a program to assist former addicts or incarcerated people
- Maximize skills of the underemployed workforce

### *Develop Aging & Active Initiatives*

- Consider launching the Back to Work 50+ Initiative
- Encourage employers to consider flex-time scheduling for older workers

### *Explore Childcare Needs*

- Conduct needs assessment



**Appendix F – Articulation Agreements**

- Maury County Public Schools
- Hickman County Schools
- Lawrence County School System
- Williamson County Schools

**TENNESSEE BOARD OF REGENTS  
COMMUNITY COLLEGE  
DUAL CREDIT CONDITIONS AND AGREEMENT  
BETWEEN  
Columbia State Community College  
AND  
Maury County School System  
For 2021-22—2025-26 Academic Year**

High school students within the Maury County School System who pass the dual credit course(s) listed may sit for the corresponding end of course assessment(s).

<b>High Schools Course Name</b>	<b>College Course Name</b>	<b>Credit Hours</b>
Mechatronics I	EETC 1311 Electrical Circuit I (2020-21)	3
Mechatronics I	ENST 2361 Fluid Power Systems (2020-21)	3
Mechatronics II	ENST 1360 Mechanical Power (2021-22) Transmission	3
Mechatronics II	EETC 2361 Instrumentation (2021-22) Technology	3

Students who receive the minimum passing score, determined by the College, on the respective end of course assessment(s) can receive dual credit at Columbia State Community College, in accordance with Early Postsecondary Opportunities Policy 2:01:00:05.

Upon conferment of a high school diploma from the Maury County School System, the student will notify the high school of his/her intent to attend Columbia State Community College. The high school will verify test scores and submit application for processing. For those students who meet all articulation requirements:

1. The student must be admitted to Columbia State Community College through the normal admissions and registration processes.
2. The high school will be responsible for ensuring all student documentation is forwarded to the Columbia State Community College admissions office for credit awarding.
3. Columbia State Community College faculty will be responsible for creating, administering, and assessing the dual credit end of course assessment.
4. Other requirements as listed on Attachment A.

Course credit will be awarded upon being officially admitted and enrolled at Columbia State Community College. The college course, credit hours and a grade of "Pass" will be shown on the Columbia State Community College transcript. Transfer of this dual credit to other institutions is at the discretion of the receiving institution.

Both the Maury County School System and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on July 1, 2021 and ending on June 30, 2026.

This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Maury County School System:**

DocuSigned by: <i>Michael Hickman</i>	2021-04-12   8:37 AM CDT
<del>Michael Hickman</del> Michael Hickman, Superintendent	Date

**Columbia State Community College :**

DocuSigned by: <i>Janet Smith</i>	2021-04-12   7:15 AM PDT
<del>Janet F. Smith</del> Janet F. Smith, Ph.D., President	Date

**Tennessee Board of Regents:**

DocuSigned by: <i>Flora W. Tydings</i>	DS <i>DWG</i>	2021-04-12   9:44 AM CDT
<del>Flora W.</del> Flora W., Tydings, Chancellor		Date

**ARTICULATION AGREEMENT COMMUNICATION  
Mechatronics to Engineering Systems Technology**

**Columbia State Community College  
and  
Maury County School System**

**STATEMENT OF INTENT**

This agreement, entered into by the parties, will provide methods of advance placement to students who complete the stated course. The purpose of this agreement is to encourage students to build on past learning experience and eliminate unnecessary duplication of instruction.

**AGREEMENT**

This agreement is effective as of the start of the 2021-2022 school year through 2026. This agreement may be terminated by either party by giving thirty (90) days written notice to the other.

The course(s) listed below has met the learning outcomes established by Columbia State Community College for the designated college courses.

<u>High School Course</u>	<u>College Course</u>	<u>College Credits</u>
Mechatronics I	EETC 1311 Electrical Circuit I (Fall assessment)	3
Mechatronics I	ENST 2361 Fluid Power Systems (Fall assessment)	3
Mechatronics II	ENST 1360 Mechanical Power Transmission (Spring Assessment)	3
Mechatronics II	EETC 2361 Instrumentation Technology (Spring Assessment)	3

**REQUIREMENTS**

*The Maury County School System agrees to the following:*

- High School teachers will participate in meetings with Columbia State Community College faculty to review college courses minimum student learning outcomes, assignments, and exam structure.
- High School Teachers will or have successfully complete training at Columbia and/or AMATROL Campus.
- Students will be trained on equipment comparable to the college's AMATROL trainers.
- High School will be responsible for purchasing the student's AMATROL e-learn licenses.
- Dual credit college assessment written exam will be monitored by a Columbia State instructor.

**ASSESSMENT REQUIREMENT**

*In addition to satisfactorily completing or being currently enrolled in the Maury County School System high school course with a B or higher, the student must complete the additional requirements.*

- Students must work on their assigned online Learning Activity Packets (LAPs) and do their skills on the AMATROL trainers.
- Earn a grade of B or better in each high school course.
- Earn a 70% or higher on the College assessment to earn college credit. A variety of questions will be asked to assess knowledge, comprehension and application of concepts including demonstration of skills in a lab practicum.

**PROCEDURES**

*To participate in the articulation program, students must:*

1. Meet specific performance requirements as outlined above.
2. Attend the Columbia State Community College assessment day and meet assessment requirements as stated.
3. Complete application for permission to take Credit by Exam and pay Credit by Exam fee for each course assessment taken. Current fee for 2020-21 is \$25 per course.)
4. Pass the assessment requirements for each course for which credit is requested.
5. Meet all regular admissions requirements of Columbia State as published in the Columbia State Community College Catalog.
6. Provide official transcript of work completed at the high school.

7. Enroll at Columbia State Community College within two (2) years of the date of graduation from high school and successfully complete 12 semester hours of resident credit (excluding development studies courses).
8. Contact the Science, Technology, and Mathematics Division at Columbia State Community College to request the articulated credit.

**TENNESSEE BOARD OF REGENTS  
COMMUNITY COLLEGE  
DUAL CREDIT CONDITIONS AND AGREEMENT  
BETWEEN  
Columbia State Community College  
AND  
Hickman County Schools  
For 2019-20—2023-24 Academic Year**

High school students within the Hickman County Schools System who pass the dual credit course(s) listed are eligible to be administered the corresponding end of course evaluation.

<u>High School Course</u>	<u>College Course</u>	<u>College Credits</u>
Mechatronics I	EETC 1311 Electrical Circuit I	3
Mechatronics I	EETC 1360 Mechanical Power Transmission	3
Mechatronics II	ENST 2361 Fluid Power Systems	3
Mechatronics II	EETC 2361 Instrumentation Technology	3

Students who receive the minimum passing score, determined by the College, on the respective end of course assessment(s) can receive college credit at Columbia State Community College, in accordance with TBR's Early Postsecondary Opportunities Policy 2:01:00:05.

Upon conferment of a diploma from a high school in the Hickman County Schools System, the student will notify the high school of his/her intent to attend Columbia State Community College. The high school will verify test scores and submit application for processing. For those students who meet all articulation requirements:

1. The student must be admitted to Columbia State Community College through the normal admissions and registration processes.
2. Upon the student's request, the high school will be responsible for ensuring all student documentation is forwarded to the Columbia State Community College Admissions office.
3. Other requirements as listed on Attachment A.

Columbia State Community College faculty will be responsible for creating, administering, and assessing the dual credit end of course assessment.

Course credit will be awarded upon being officially admitted and enrolled at Columbia State Community College. The corresponding college course, credit hours/ clock hours, and a grade of "Pass" will be shown on the Columbia State Community College transcript. Transfer of this dual credit to other institutions is at the discretion of the receiving institution.

Both the Hickman County Schools System and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on July 1, 2019 and ending on June 30, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Hickman County Schools:**

DocuSigned by:  
*Michelle Gilbert* 2019-06-08 | 7:25 AM PDT  
Michelle Gilbert, Director of Schools Date  
B67D51F0B9FE4A3...

**Columbia State Community College :**

DocuSigned by:  
*Janet Smith* 2019-06-11 | 10:05 AM PDT  
Janet F. Smith, Ph.D., President Date  
B5D923624DBF428...

**Tennessee Board of Regents:**

DocuSigned by:  
*Flora W. Tydings* <sup>DS</sup>  
Dr. Flora W. Tydings, Chancellor *RS* 2019-06-11 | 3:17 PM CDT Date  
33FA05902204B0...

ATTACHMENT A

**ARTICULATION AGREEMENT COMMUNICATION  
Science, Technology, Engineering, and Mathematics**

**Engineering Systems Technology**

**Columbia State Community College**

**and**

**Hickman County Schools**

**STATEMENT OF INTENT**

This agreement, entered into by the parties, will provide methods of advance placement to students who complete the stated course. The purpose of this agreement is to encourage students to build on past learning experience and eliminate unnecessary duplication of instruction.

**AGREEMENT**

The course(s) listed below has met the learning outcomes established by Columbia State Community College for the designated college courses.

<u>High School Course</u>	<u>College Course</u>	<u>College Credits</u>
Mechatronics I	EETC 1311 Electrical Circuit I	3
Mechatronics I	EETC 1360 Mechanical Power Transmission	3
Mechatronics II	ENST 2361 Fluid Power Systems	3
Mechatronics II	EETC 2361 Instrumentation Technology	3

**College Course Objectives/ Outcomes**

*Upon completion of EETC 1311, ENST 2361, EETC 1360, and EETC 2361, students will demonstrate the ability to:*

1. Design new electrical circuits and diagnose existing electrical circuits.
2. Design, connect and operate hydraulic and pneumatic circuits for machinery in industrial applications.
3. Design a mechanical systems involving v-belt, chains, spur gears, shafts, sprockets and bearings while everything is aligned to ensure wear free operation.
4. Demonstrate knowledge of process control systems to monitor and control fluid levels using manual and automatic controls.

**REQUIREMENTS**

*In addition to satisfactorily completing or being currently enrolled in the East Hickman high school course with a B or higher, the student must complete the additional requirements.*

- A grade of C or better in each course. Each course will follow the CSCC lesson plan and exam structure during the semester.
- Teachers at East Hickman must have a minimum of an Associate degree in teaching discipline.
- Teachers will be required to be trained at Columbia and/or AMATROL Campus.
- Classroom will have a maximum of 15 students but not less than 10 students.
- East Hickman will be responsible for the maintenance of the equipment.
- East Hickman will be responsible for purchasing the student's AMATROL e-learn licenses

**ASSESSMENT REQUIREMENT**

- A dual credit course will follow the exact course syllabus offered at Columbia State
- Students must work on their assigned online Learning Activity Packets (LAPs) and do their skills on the AMATROL trainers.
- Dual credit written exams will be monitored by a Columbia State instructor
- Lab exams will be done by either East Hickman or Columbia State Instructor



## ATTACHMENT A

### PROCEDURES

*To participate in the articulation program, students must:*

1. Meet specific performance requirements as outlined above.
2. Attend the Columbia State Community College assessment day and meet assessment requirements as stated.
3. Pass the assessment requirements for each course for which credit is requested.
4. Enroll at Columbia State Community College within two (2) years of the date of graduation from high school and successfully complete 12 semester hours of resident credit (excluding development studies courses).
5. Contact the Science Technology and Mathematics Division at Columbia State Community College to request the articulated credit.

**TENNESSEE BOARD OF REGENTS  
COMMUNITY COLLEGE  
DUAL CREDIT CONDITIONS AND AGREEMENT  
BETWEEN  
Columbia State Community College  
AND  
Lawrence County School System  
For 2020-21—2024-25 Academic Year**

High school students within the Lawrence County School System who pass the dual credit course(s) listed may sit for the corresponding end of course assessment(s).

<b>High Schools Course Name</b>	<b>College Course Name</b>	<b>Credit Hours</b>
Mechatronics I	EETC 1311 Electrical Circuit I (2020-21)	3
Mechatronics I	ENST 2361 Fluid Power Systems (2020-21)	3
Mechatronics II	ENST 1360 Mechanical Power (2021-22) Transmission	3
Mechatronics II	EETC 2361 Instrumentation (2021-22) Technology	3

Students who receive the minimum passing score, determined by the College, on the respective end of course assessment(s) can receive dual credit at Columbia State Community College, in accordance with Early Postsecondary Opportunities Policy 2:01:00:05.

Upon conferment of a high school diploma from the Lawrence County School System, the student will notify the high school of his/her intent to attend Columbia State Community College. The high school will verify test scores and submit application for processing. For those students who meet all articulation requirements:

1. The student must be admitted to Columbia State Community College through the normal admissions and registration processes.
2. The high school will be responsible for ensuring all student documentation is forwarded to the Columbia State Community College admissions office for credit awarding.
3. Columbia State Community College faculty will be responsible for creating, administering, and assessing the dual credit end of course assessment.
4. Other requirements as listed on Attachment A.

Course credit will be awarded upon being officially admitted and enrolled at Columbia State Community College. The college course, credit hours and a grade of "Pass" will be shown on the Columbia State Community College transcript. Transfer of this dual credit to other institutions is at the discretion of the receiving institution.

Both the Lawrence County School System and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational

Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on July 1, 2020 and ending on June 30, 2025.

This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Lawrence County School System:**

DocuSigned by: 	2020-08-24   2:56 PM CDT
Michael Adkins, Interim Director of Schools	Date

**Columbia State Community College :**

DocuSigned by: 	2020-08-24   1:24 PM PDT
Janet P. Smith, Ph.D., President	Date

**Tennessee Board of Regents:**

DocuSigned by: 	DS 	2020-08-24   4:02 PM CDT
Horn W. Tydings, Chancellor		Date

## Attachment A

**ARTICULATION AGREEMENT COMMUNICATION  
Mechatronics to Engineering Systems Technology**

**Columbia State Community College  
and  
Lawrence County School System**

**STATEMENT OF INTENT**

This agreement, entered into by the parties, will provide methods of advance placement to students who complete the stated course. The purpose of this agreement is to encourage students to build on past learning experience and eliminate unnecessary duplication of instruction.

**AGREEMENT**

This agreement is effective as of the start of the 2020-2021 school year through 2025. This agreement may be terminated by either party by giving thirty (90) days written notice to the other.

The course(s) listed below has met the learning outcomes established by Columbia State Community College for the designated college courses.

<u>High School Course</u>	<u>College Course</u>	<u>College Credits</u>
Mechatronics I	EETC 1311 Electrical Circuit I	3
Mechatronics I	ENST 2361 Fluid Power Systems	3
Mechatronics II	ENST 1360 Mechanical Power Transmission	3
Mechatronics II	EETC 2361 Instrumentation Technology	3

College Course Objectives/ Outcomes

*Upon completion of EETC 1311, ENST 2361, ENST 1360, and EETC 2361, students will demonstrate the ability to:*

1. Design new electrical circuits and diagnose existing electrical circuits. (EETC 1311)
2. Design, connect and operate hydraulic and pneumatic circuits for machinery in industrial applications. (ENST2361)
3. Design a mechanical systems involving v-belt, chains, spur gears, shafts, sprockets and bearings while everything is aligned to ensure wear free operation. (ENST 1360)
4. Demonstrate knowledge of process control systems to monitor and control fluid levels using manual and automatic controls. (EETC 2361)

**REQUIREMENTS**

*The Lawrence County School System agrees to the following:*

- Each course will follow the Columbia State Community College course syllabus, lesson plan, and exam structure during the semester.
- High School Teachers have earned a minimum of an Associate degree in teaching discipline.
- High School Teachers will successfully complete training at Columbia and/or AMATROL Campus.
- High School dual credit class will have a maximum of 15 students but not less than 10 students.
- High School will be responsible for the maintenance of the equipment.
- High School will be responsible for purchasing the student's AMATROL e-learn licenses.
- Dual credit college assessment written exam will be monitored by a Columbia State instructor.
- Lab exams will be monitored by either Lawrence County High School or Columbia State Instructor.

**ASSESSMENT REQUIREMENT**

*In addition to satisfactorily completing or being currently enrolled in the Lawrence County School System high school course with a B or higher, the student must complete the additional requirements.*

- Students must work on their assigned online Learning Activity Packets (LAPs) and do their skills on the AMATROL trainers.
- Earn a grade of C or better in each high school course.
- Earn a 70% or higher on the College assessment to earn college credit.

**PROCEDURES**

*To participate in the articulation program, students must:*

1. Meet specific performance requirements as outlined above.
2. Attend the Columbia State Community College assessment day and meet assessment requirements as stated.
3. Pay \$25 fee for each course assessment.
4. Pass the assessment requirements for each course for which credit is requested.
5. Enroll at Columbia State Community College within two (2) years of the date of graduation from high school and successfully complete 12 semester hours of resident credit (excluding development studies courses).
6. Contact the Science Technology and Mathematics Division at Columbia State Community College to request the articulated credit.

**AGREEMENT BETWEEN  
THE WILLIAMSON COUNTY BOARD OF EDUCATION  
and  
COLUMBIA STATE COMMUNITY COLLEGE  
for  
PROVIDING MECHATRONICS EQUIPMENT AND MECHATRONICS CLASSES  
AT  
FAIRVIEW HIGH SCHOOL**

This Agreement is entered into this the 15 day of March, 2016, by and between the **Williamson County Board of Education** of Franklin, TN (hereinafter "WCS"), and **Columbia State Community College** of Columbia and Franklin, TN (hereinafter "CSCC").

**WITNESSETH**

WHEREAS, CSCC desires to provide mechatronics-based education to its students at Fairview High School, 2595 Fairview Blvd, Fairview, TN (hereinafter "Fairview" or "the Premises"); and

WHEREAS, WCS desires to provide a facility for such use and make available to its students CSCC equipment during the regular high school day; and

WHEREAS, WCS and CSCC desire to facilitate increased high school participation in joint enrollment Mechatronics coursework in three Phases with a ultimate goal of an embedded AAS Degree as Phase III in 2018-19 (see appendix A) pending attainment of grant funding. Phase I consists of dual credit courses in 2016-17(see appendix B) and Phase II consists of an embedded Technical Certificate in 2017-18 (see appendix C);

WHEREAS, WCS and CSCC agree that it is appropriate for parties hereto to enter into an agreement for use of the facilities,


NOW, THEREFORE, in consideration of the premises and the mutual agreements contained herein, the parties hereby agree as follows:

1. WCS will make available to CSCC two (2) classrooms at Fairview to be used for CSCC classes during the 2016-2017 school year.
2. CSCC shall provide part of the equipment needed to stock labs in order to fulfill the requirements of the Dual Credit courses and the Technical Certificate in Advanced Integrated Industrial Technology (see appendix D).
3. CSCC shall provide WCS with a calendar and schedule of class times no later than thirty (30) days before said usage shall begin. WCS shall provide a building monitor during the times of CSCC use after regular WCS school hours, at its own expense.
4. CSCC will provide access to the online lecture for dual enrolled WCS students in 2016-17 and WCS will provide said access to Dual Credit enrolled WCS students after year one of the agreement.

5. WCS shall have the authority to use the said equipment at all times during its regular school hours and other times during which CSCC is not using them for its classes.
6. WCS's Maintenance Department shall have the authority to maintain said equipment and repair as needed.
7. CSCC shall have use of the Fairview High School main parking lot to the extent necessary for its use of the classrooms.
8. CSCC will not at any time use or occupy the Premises in violation of laws, ordinances, or regulations of any government or agency having jurisdiction over said premises.
9. All CSCC employees and contractors shall comply with the criminal background checks and other statutory requirements of its employees and contractors.
10. The parties hereto shall comply with the terms of the Family Educational Rights & Privacy Act (FERPA), 20 USC §1232g, the Children's Internet Protection Act (CIPA), 47 USC §254(h), and other federal and state laws applicable to students.
11. CSCC is a public institution of higher education and a member of the State University and Community College System of Tennessee governed by the Tennessee Board of Regents. As a state entity its liability arising from performance under this agreement shall be subject to and limited to those rights and remedies, if any, available under T. C. A. §§ 9-8-101 through 9-8-407. WCS is a political subdivision of the state, and, as such, its liability to third parties for injuries which may result from its performance under this agreement shall be subject to and limited to those rights and remedies, if any, available under the Tennessee Governmental Tort Liability Act, §§ T. C. A. 29-20-201, et seq.
12. Each party shall be solely liable for payment of its portion of all claims, liability, costs, expenses, demands, settlements, or judgments resulting from action or omissions of itself or those for whom it is legally responsible, relating to or arising under this Agreement.
13. This Agreement shall in no way be interpreted as creating an agency or employment relationship between the parties.
14. This term of this agreement shall begin upon execution of this agreement and terminate on May 31, 2017 and shall automatically renew perpetually for one-year periods beginning June 1, 2017 unless terminated by either party upon written notice no later than May 1 of each year.

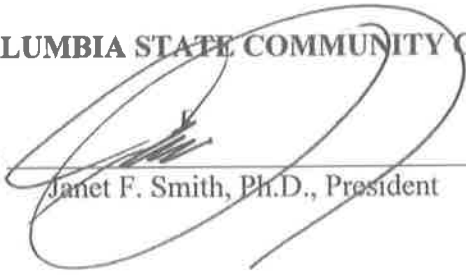
IN WITNESS WHEREOF, the parties have executed the above-written agreement on the date and year listed below, but effective as of the date first written above.

**WILLIAMSON COUNTY SCHOOLS**

By:   
Mike Looney, Ed.D., Superintendent

Date 4/23/15

**COLUMBIA STATE COMMUNITY COLLEGE**

By:   
Janet F. Smith, Ph.D., President

Date 3.10.16



**Appendix A  
Phase III**

**ASSOCIATE DEGREE CREDITS TEMPLATE**

**Revised 2-23-16**

Subjects/Credits Needed	Ninth Grade 6.0 Credits	Tenth Grade 7.0 Credits	Eleventh Grade 7.0 Credits	Twelfth Grade 6.5 Credits
English	English I	English II	English III	English IV/ <b>1010 (DE – 3 hrs)</b>
Math	Algebra I	Geometry	Algebra II	WCS College Algebra – State Dual Credit (3 hrs.)
Science	Biology I	Chemistry or Physics	Physical Science CSCC Dual Credit (4 hrs)	N/A
Social Studies 3.5*	World History		U.S. History	<b>Economics (DE – 3 hrs)/U.S. Government</b>
World Language		Spanish I	Spanish II	
Fine Arts	Study Hall			FrHS Fine Art/ <b>CSCC Fine Art (DE – 3 Sem. Hrs.)</b>
Physical Ed	Wellness	P.E./*Personal Finance		<b>Computer Apps/Mechatronics (DE – 6 hrs)</b>
Electives	Technology Design	<b>Mechatronics (Dual Credit – 6 hrs)</b>	<b>Mechatronics (DE – 6 hrs)</b>	<b>Mechatronics (DE – 6 hrs)</b>
Electives		<b>Mechatronics (Dual Credit – 6 hrs)</b>	<b>Mechatronics (DE – 6 hrs)</b>	<b>Mechatronics/Mechatronics Internship (DE – 6hrs)</b>

**Notes: Mechatronics** 42 DE/DC hours

Additional college coursework 19 DE/DC hours

Total College Credit 61 Credit Hours

Total High School Credit 26.50 Credits (22.0 required)

This model would require a minimum of .50 credit be earned outside of the regular school day. High School Load could be lessened dependent upon student's beginning world language requirement in middle school or submission of a Foreign Language/Fine Arts Waiver (which would reduce total high school credits by 3.0) or a P.E. waiver (.50 credit). **Speech 1010 is now required.**

Foundations of Technology completed in 8<sup>th</sup> grade

3-hour Mechatronics Internship to be completed during summer following junior year

## Appendix B

### Phase I

#### Mechatronics Dual Credit Articulation

Mechatronics I to Articulate with Columbia State courses as follows:

<u>Course</u>	<u>Credit Hours</u>
• AIT 1001 Basic Electricity	2
• AIT 1002 Power Development	1
• AIT 1003 Hydraulic/Pneumatic Fundamentals	1
• AIT 1301 Principles of Instrumentation	2

Mechatronics II to Articulate with Columbia State courses as follows:

• AIT 1600 Workplace Safety	1
• AIT 1101 Electrical Power Distribution	1
• AIT 1102 Fluid Power Distribution	2
• AIT 1201 Electrical Installation	1
• AIT 1202 Piping & Pneumatic Installation	1

#### Mechatronics I Learning Objectives

After the completion of the course, the student should be able to do the following:

- ✓ Define electricity. Connect/operate power supplies while demonstrating input and output devices such as switches, buzzers, solenoids, and motors.
- ✓ Use both digital and analog voltmeters along with ammeters in measuring volts and current in series and parallel circuits.
- ✓ Explain Ohm's Law and Kirchhoff's Law and the needed calculations to figure total power in series and parallel circuits.
- ✓ Demonstrate knowledge of electromagnetism, inductance, and capacitance in series and parallel circuits.
- ✓ Troubleshoot both a short circuit and an open circuit issue in a basic light circuit.
- ✓ Connect and operate a transformer and demonstrate how to calculate the secondary coil as well as the output voltage of the transformer
- ✓ Determine the Brush Polarity of a DC Generator Using a DMM
- ✓ Connect and Operate a DC Series Generator.
- ✓ Connect and Operate a Self-Excited DC Shunt Generator.
- ✓ Connect and Operate a Separately-Excited DC Shunt Generator
- ✓ Connect and Operate a DC Compound Generator
- ✓ Read a Pneumatic Pressure Gauge.
- ✓ Connect and Adjust a Pressure Regulator.

## Appendix B

### Phase I

- ✓ Drain a Pneumatic Filter.
- ✓ Connect a Pneumatic Hose That Uses Quick-Connect Fittings.
- ✓ Use a Tee to Connect Two and Three Circuit Branches Together
- ✓ Connect and Operate a Double-Acting Pneumatic Cylinder Using a 3-Position, Manually-Operated DCV
- ✓ Design a Multiple Cylinder Pneumatic Circuit
- ✓ Connect and Operate a Single-Acting Pneumatic Cylinder Using a 3/2 Manually-Operated DCV
- ✓ Connect and Operate a Uni-Directional Pneumatic Motor Using a 3-way, Manually-Operated DCV
- ✓ Identify Pneumatic Symbols
- ✓ Draw a Pneumatic Schematic from the Actual Circuit Connections on the Machine
- ✓ Connect a Pneumatic Circuit Given a Schematic
- ✓ Design a Multiple Actuator Pneumatic Circuit
- ✓ Read a Hydraulic Pressure Gauge
- ✓ Read the Liquid Level and Temperature in the Reservoir
- ✓ Operate a Hydraulic Power Unit
- ✓ Connect and Disconnect a Hydraulic Hose That Uses Quick-Connect Fittings
- ✓ Use a Tee to Connect Two Circuit Branches Together
- ✓ Connect and Operate a Double-Acting Hydraulic Cylinder Using a 3-Position, Manually-Operated DCV
- ✓ Design a Dual Cylinder Hydraulic Circuit
- ✓ Connect and Read a Flow Meter
- ✓ Connect and Operate a Needle Valve to Control the Speed of an Actuator
- ✓ Control the Speed of an Actuator Using a Manually-Operated DCV
- ✓ Connect and Operate a Bi-Directional Hydraulic Motor Using a 3-Position, Manually-Operated DCV
- ✓ Draw a Hydraulic Schematic from the Actual Circuit Connections on the Machine
- ✓ Connect a Hydraulic Circuit Given a Schematic
- ✓ Design a Multiple Actuator Hydraulic Circuit
- ✓ Determine the manipulated and controlled variables given process descriptions.
- ✓ Manually control the liquid level in a tank using open and closed loop methods.
- ✓ Identify the type and location using an instrument tag.
- ✓ Draw an instrument tag given device information.
- ✓ Identify P&ID line, valve,, actuator, and pump symbols
- ✓ Interpret instrument data using an instrument index.
- ✓ Power up a Honeywell UDC 3500 controller and perform a display and key test.
- ✓ Connect and operate a loop controller in the manual mode

### Mechatronics II Learning Objectives

After the completion of the course, the student should be able to do the following:

- ✓ Locate and apply OSHA Safety and Health standards, policies and procedures
- ✓ Utilize OSHA standards and regulations to supplement an on-going safety and health program

## Appendix B

### Phase I

- ✓ Identify common violations of OSHA standards and propose abatement actions
- ✓ Describe appropriate abatement procedures for selected safety and health hazard
- ✓ Obtain the 10 Hour General Industry OSHA Safety Training card
- ✓ Describe the Function of the Four Basic Parts of a Wiring System
- ✓ EMT Conduit Cutoff and Preparation
- ✓ Lay Out and Bend EMT with Proper Leg Length and Stub-Up.
- ✓ Bend IMC with a Mechanical Bender
- ✓ Cut and Connect Flexible Metal Conduit
- ✓ Select Wire Size and Type for an Application
- ✓ Use NEC Tables to Select the Proper Size Raceway for Same Size/Type Conductors
- ✓ Design and Install a Wiring System Given Specifications
- ✓ Connect and operate a needle valve to control actuator speed
- ✓ Design speed control circuits.
- ✓ Calculate the cylinder stroke given its size and a flow rate.
- ✓ Design a circuit to provide bypass flow
- ✓ Connect and operate a pressure sequence circuit.
- ✓ Design a hydraulic circuit that uses a pressure reducing valve
- ✓ Connect and operate a hydraulic 4/2 DCV
- ✓ Design a hydraulic sequence circuit using a cam operated hydraulic valve.
- ✓ Connect and operate a basic regeneration circuit
- ✓ Set up, adjust, and operate a cylinder synchronization circuit using flow control valves.
- ✓ Interpret an electrical print
- ✓ Determine the number of wires to run from a control panel to an operator station
- ✓ Wire an electrical panel
- ✓ Calculate the efficiency of a motor given input and output power.
- ✓ Select the correct DC motor for an application based on motor performance characteristics
- ✓ Connect and operate a split phase motor as well as a DC series generator
- ✓ Control the frequency of an alternator.
- ✓ Identify pipe function by color code
- ✓ Design and draw a piping schematic for a given application
- ✓ Use a pipe threading machine to cut threads on a pipe
- ✓ Install an expansion joint and pipe insulation
- ✓ Select and size plastic pipe for an application
- ✓ Determine bend locations and angles given a tubing layout drawing
- ✓ Determine hose length given a layout drawing and make the required hoses.
- ✓ Connect and operate a manually operated two-way valve which has threaded ports.
- ✓ Disassemble, repair, and test a two-way valve
- ✓ Disassemble and rebuild a Sloan valve.

**Appendix C  
Phase I**

**TECHNICAL CERTIFICATE CREDITS TEMPLATE**

2/8/2016

<b>Subjects/Credits Needed</b>	<b>Ninth Grade 6.0 Credits</b>	<b>Tenth Grade 7.0 Credits</b>	<b>Eleventh Grade 7.0 Credits</b>	<b>Twelfth Grade 6.5 Credits</b>
English 4.0	English I	English II	English III	English IV/ 6.5 Credits
Math 4.0	Algebra I	Geometry	Algebra II	College Algebra – State Dual Credit (3 hrs.)
Science 3.0	Biology I	Chemistry or Physics	???????	N/A
Social Studies 3.5*	World History		U.S. History	)U.S. Government
World Language 2.0		Spanish I	Spanish II	
Fine Arts 1.0	Study Hall			FrHS Fine Art/
Physical Ed 1.5	Wellness	P.E./*Personal Finance		Computer Apps
Electives 4.0	Technology Design	?????	Mechatronics (DE – 6 hrs)	Mechatronics (DE – 7 hrs)
Electives 3.0		??????	Mechatronics (DE – 6 hrs)	Mechatronics/Internship (DE – 3hrs)

Notes: Mechatronics 22 DE hours  
 Additional college coursework 22 DE hours  
 Total College Credit 22 Credit Hours  
 Total High School Credit 26.50 Credits (22.0 required)  
 This model would require a minimum of .50 credit be earned outside of the regular school day. High School Load could be lessened dependent upon student's beginning world language requirement in middle school or submission of a Foreign Language/Fine Arts Waiver (which would reduce total high school credits by 3.0) or a P.E. waiver (.50 credit).  
 Foundations of Technology completed in 8<sup>th</sup> grade  
 3-hour Mechatronics Internship to be completed during summer following junior year

**Appendix D**

**Fall 2016 Start-up Equipment**

AIT 1001	Basic Electricity	T7017	\$5,000
AIT 1002	Power Development	85-MT2	\$31,694
AIT 1003	Hydraulic/Pneumatic Fundamentals	850-H1, 85-BP	\$ 18,260
AIT 1301	Principles of Instrumentation	T5552	\$20,309
<b>Spring</b>	<b>2017</b>		
AIT 1600	Workplace Safety	None needed	
AIT 1101	Electrical Power Distribution	85-MT7	\$16,500
AIT 1102	Fluid Power Distribution	85-IH (w/ 85-H1)	\$14,000
AIT 1202	Piping, Pneumatic and Installation	950-PS1	\$11,000
AIT 1203	Mechanical Installation	950-ME1	\$14,932

**Total      \$131,776**

**Appendix D**

**WCS Provided Equipment**

85-MT2	\$31,694
85-BP	4,760
85-IH	6,576
<u>950-ME1</u>	<u>14,932</u>
Total	\$57,962

**Columbia State Provided Equipment**

T7017	\$5,000
850-H1	13,549
T5552	20,309
85-MT7	16,500
<u>950-ME1</u>	<u>10,200</u>
Total	\$65,558

**(All prices do not include shipping and installation and are an estimate as of 2/22/2016)**

## Appendix G - References

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- <sup>i</sup> [https://www.tn.gov/content/dam/tn/education/data/2022-23\\_school\\_grad\\_rate\\_suppressed.xlsx](https://www.tn.gov/content/dam/tn/education/data/2022-23_school_grad_rate_suppressed.xlsx)
- <sup>ii</sup> <https://tnecd.com/wp-content/uploads/2020/10/2020-LEAP-Report-10-27-2020.pdf>
- <sup>iii</sup> <https://tnecd.com/wp-content/uploads/2020/10/2020-LEAP-Report-10-27-2020.pdf>
- <sup>iv</sup> [https://www.bls.gov/oes/current/oes\\_tn.htm](https://www.bls.gov/oes/current/oes_tn.htm)
- <sup>v</sup> <https://livingwage.mit.edu/states/47/locations>
- <sup>vi</sup> [https://www.bls.gov/oes/current/oes\\_tn.htm](https://www.bls.gov/oes/current/oes_tn.htm)
- <sup>vii</sup> <https://www.tbr.edu/policy-strategy/tn-education-and-workforce-maps>
- <sup>viii</sup> <https://www.projectionscentral.org/>