State Technical College of Missouri guarantees satisfaction with the training it provides. Any graduate of the college who is found by either his or her employer or the graduate to lack entry-level skills (competencies) listed in the graduate’s records as having been satisfactorily demonstrated may return to State Technical College of Missouri for retraining with the tuition being waived. This guarantee shall be subject to the following terms:

1. The guarantee shall be good for 180 days after graduation; i.e., the performance deficiency must be identified within 180 days.

2. The graduate must notify the college of his or her intent to return for retraining within 210 days after graduation.

3. The retraining must be completed the first time it is offered as a part of the college’s regular schedule after the college is notified of the graduate’s intent to accomplish retraining.
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<tr>
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<tr>
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<tr>
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<td>December 3*</td>
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<tr>
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<td>December 4*</td>
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<tr>
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<td>October 11</td>
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</tr>
<tr>
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<td>October 13</td>
<td>October 20</td>
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<tr>
<td>Beginning of 2nd 8 Weeks</td>
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</tr>
<tr>
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<td>November 25-26</td>
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</tr>
<tr>
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<td>On or before Dec. 15</td>
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<tr>
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<td>December 16</td>
<td>December 15</td>
</tr>
<tr>
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<td>December 16</td>
<td>December 17</td>
<td>December 16</td>
</tr>
<tr>
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<td>December 17</td>
<td>December 18</td>
<td>December 17</td>
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<tr>
<td><strong>SPRING SEMESTER</strong></td>
<td></td>
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<tr>
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<td>January 16</td>
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<td>March 3</td>
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<td>March 1</td>
<td>March 1</td>
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<tr>
<td>Beginning of 2nd 8 Weeks</td>
<td>March 4</td>
<td>March 3</td>
<td>March 2</td>
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<tr>
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<td>April 9</td>
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<tr>
<td>Finals</td>
<td>May 5-7</td>
<td>April 27-29</td>
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<tr>
<td>HEO Classes End</td>
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<td>May 5</td>
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<tr>
<td>Spring Semester Ends</td>
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<td>April 30</td>
<td>May 6</td>
<td>May 5</td>
</tr>
<tr>
<td>Commencement</td>
<td>May 9</td>
<td>May 1</td>
<td>May 7</td>
<td>May 6</td>
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<td><strong>SUMMER SEMESTER</strong></td>
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<tr>
<td>HEO Classes Begin</td>
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<td>June 7</td>
<td>June 6</td>
<td>June 5</td>
</tr>
<tr>
<td>End of 1st 8 Weeks</td>
<td>June 30</td>
<td>June 29</td>
<td>June 28</td>
<td>June 27</td>
</tr>
<tr>
<td>Beginning of 2nd 8 Weeks</td>
<td>July 1</td>
<td>June 30</td>
<td>June 29</td>
<td>June 28</td>
</tr>
<tr>
<td>DAT/PNT Classes Begin</td>
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<td>June 30</td>
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<td>June 28</td>
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<td>July 5</td>
<td>July 4</td>
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<tr>
<td>Finals</td>
<td>August 17</td>
<td>August 16</td>
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</tr>
<tr>
<td>Finals/Summer Semester Ends</td>
<td>August 18</td>
<td>August 17</td>
<td>August 16</td>
<td>August 15</td>
</tr>
</tbody>
</table>

* The College is closed to the public. This is a required work day for college employees.
+ The College is open on Professional Development Day and Advisory Council during fall 2020 only.

College academic calendar is subject to change.
Approved September 18, 2020 by the State Technical College of Missouri Board of Regents.
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ABOUT THE COLLEGE

MISSION

The State Technical College of Missouri prepares students for profitable employment and a life of learning.

MISSION STATEMENT

The State Technical College of Missouri is an associate degree and certificate granting institution with open/selective enrollment and a mission focusing on access to highly specialized technical education in both emerging and traditional technologies. The State Technical College of Missouri prepares students for profitable employment and a life of learning. Profitable employment is self-employment and entrepreneurship as well as working for an employer. The mission is accomplished within the charges of the legislative mission.

Legislative Mission:

“1. State Technical College of Missouri shall be a special purpose institution that shall make available to students from all areas of the state exceptional educational opportunities through highly specialized and advanced technical education and training at the certificate and associate degree level in both emerging and traditional technologies with particular emphasis on technical and vocational programs not commonly offered by community colleges or area vocational technical schools. Primary consideration shall be placed on the industrial and technological manpower needs of the state. In addition, State Technical College of Missouri is authorized to assist the state in economic development initiatives and to facilitate the transfer of technology to Missouri business and industry directly through the graduation of technicians in advanced and emerging disciplines and through technical assistance provided to business and industry. State Technical College of Missouri is authorized to provide technical assistance to area vocational technical schools and community colleges through supplemental on-site instruction and distance learning as such area vocational technical schools and community colleges deem appropriate.

2. Consistent with the mission statement provided in subsection 1 of this section, State Technical College of Missouri shall offer vocational and technical programs leading to the granting of certificates, diplomas, and applied science associate degrees, or a combination thereof. State Technical College of Missouri may offer associate of arts or baccalaureate degrees only when authorized by the coordinating board for higher education in circumstances where the level of education required in a field for accreditation or licensure increases to the baccalaureate degree level or, in the case of applied bachelor’s degrees, the level of education required for employment in a field increases to that level, and when doing so would not unnecessarily duplicate an existing program, collaboration with a university is not feasible or the approach is not a viable means of meeting the needs of students and employers, and the institution has the academic and financial capacity to offer the program in a high-quality manner. Quality for such baccalaureate degree programs shall be evaluated at least in part by delivery of upper-level coursework or competencies, and defined by accreditation or compliance with the Higher Learning Commission standards for bachelor’s degrees. State Technical College of Missouri shall also continue its role as a recognized area vocational technical school as provided by policies and procedures of the state board of education.” Mo. Rev. Stat. § 178.636

VISION

The State Technical College of Missouri, as the premier public institution of technical education supporting economic development in the state of Missouri, is dedicated to serving the state’s diverse population. As a student-centered education community, the institution maximizes students’ learning potential by providing them with specialized knowledge in traditional and emerging technical areas as well as general knowledge that fosters a life of learning.

LEGISLATIVE HISTORY

Linn Technical Junior College and later Linn Technical College (1968), supported by a grant to the Osage County R-II School District from the National Defense Education Act of 1958, offered its first program in electronics in the fall of 1961. By 1965 the College was awarded the status of an Area Vocational Technical School by the Missouri State Board of Education through the federal Vocational Education Act of 1963. In 1991, statutory authority was established for the granting of associate degrees and certificates. In 1995, Senate Bill 101 created “Linn State
Technical College.” The College continued to be governed by the Osage County R-II School Board until July 1, 1996 when the Board of Regents accepted full responsibility for the institution as Linn State Technical College. It became Missouri's first and only public institution devoted solely to technical education at the Associate of Applied Science level. In 2013, House Bill 673 changed the name of the institution to “State Technical College of Missouri” effective July 1, 2014. This change better reflects the institution’s statewide role in technical education.

VALUES
To fulfill our mission and to achieve our vision, State Technical College of Missouri values the following:

- Responsiveness to the economic development needs of the state of Missouri.
- A comprehensive academic experience that prepares students for employment in technical careers of today and tomorrow.
- A collaborative academic development that fosters continued growth, academic freedom, and professional development of faculty and staff.
- An inclusive campus community that reflects the demographics of the region and embraces the diversity of Missouri.

INSTITUTIONAL GOAL STATEMENTS
In pursuit of its mission the College sets forth the following institutional goal statements:

1. Workforce Development – Meeting our Statewide Mission by growing the workforce and preparing students for profitable employment and a life of learning.
2. Employee Support and Development – Empowering excellence inside and out of the classroom is key to growing reputation and enrollment.
3. Financial Responsibility and Accountability – Maintaining outcomes during growth while minimizing additional costs through improved efficiency and additional revenues.

THE HIGHER LEARNING COMMISSION ACCREDITATION
State Technical College of Missouri is accredited by the Higher Learning Commission (hlcommission.org), a regional accreditation agency recognized by the U.S. Department of Education.

NONDISCRIMINATION POLICY
As per Federal mandate, applicants for admission and employment, students, parents of secondary school students, employees, sources of referral of applicant for admission and employment, and all unions or professional organizations holding collective bargaining or professional agreements with State Technical College of Missouri are hereby notified that State Technical College of Missouri is committed to nondiscrimination and equal opportunities in its admissions, educational programs, activities and employment regardless of race, gender identity, gender expression, sex, sexual orientation, religion, color, national origin, age, disability, or status as a protected veteran to ensure nondiscrimination.

Any person having inquiries concerning State Technical College of Missouri compliance with regulations implementing Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973 or the Americans Disabilities Act of 1990 is directed to contact the Vice President of Student Affairs by telephone at (573) 897-5000 or by mail at State Technical College of Missouri, One Technology Drive, Linn, MO 65051. The Vice President of Student Affairs is responsible for coordinating the institution’s efforts to comply with the regulations implementing Title VI, Title IX, Section 504 and the Americans with Disabilities Act.

Any person may contact the Office for Civil Rights, U.S. Department of Education regarding the institution’s compliance with the regulations implementing Title VI, Title IX or Section 504. The Kansas City Office for Civil Rights may be reached at U.S. Department of Education, Office for Civil Rights, 8930 Ward Parkway, Suite 2037, Kansas City, MO 64114-3302. The telephone number is (816) 268-0550 and fax number is (816) 823-1404. Telecommunication Device for the Deaf (TDD): (877) 521-2172. E-mail: OCR.KansasCity@ed.gov and Website: http://www2.ed.gov/about/offices/list/ocr/addresses.html.
A student may not be discriminated against on the basis of race, gender identity, gender expression, sex, sexual orientation, religion, color, national origin, age, disability, or status as a protected veteran in:

- Admission
- Access to enrollment in courses
- Access to and use of college facilities
- Counseling and guidance materials, tests, and practices
- Vocational education
- Physical education
- Competitive athletics
- Graduation requirements
- Student rules, regulations, and benefits
- Treatment as a married and/or pregnant student
- Housing
- Financial assistance
- Placement services
- Health services
- College-sponsored extracurricular activities
- Most other aid, benefits or services

A student may also file a complaint of illegal discrimination with the Office of Civil Rights, Department of Health, Education, and Welfare, Washington, DC, or the Missouri Commission on Human Rights, at the same time the State Technical College of Missouri grievance process is filed; or without using the State Technical College of Missouri grievance process.

If a student files a complaint with the Office of Civil Rights, he/she must file it, in writing, no later than 180 days after the occurrence of the possible discrimination. For assistance, see the Counseling Services Staff or Vice President of Student Affairs. The Counseling Services Staff or Vice President of Student Affairs will supply the current Office of Civil Rights address. If a complaint is filed with State Technical College of Missouri, the student will have a year to file the paperwork.

BOARD OF REGENTS
The Board of Regents members are appointed by the Governor and confirmed by the Senate. The Board of Regents is charged by the State with the prime responsibility for administering State Technical College of Missouri. Individual members have power and authority only when acting formally as members of the Board of Regents in session or when entrusted by the Board of Regents with definite responsibilities.

ADVISORY COUNCIL
Each major program shall have an Advisory Committee composed of individuals representing a cross section of business and industry; these advisors make recommendations to the college regarding industry standards and expectations, curriculum, technical requirements, and assessment benchmarks. The Advisory Council comprises each program’s Advisory Committee.

FACILITIES AND RESOURCES

Missouri’s Green State Technical College
State Technical College of Missouri is located in rural America where a great deal of respect is given to the land, air, and energy. College faculty, staff, and administration give consideration to cost effective, reliable, sustainable, and environmentally friendly alternatives on campus and in the classroom.

State Technical College of Missouri saw the value in geothermal heating and cooling over twenty years ago. Ninety-five percent of the main campus academic and housing square footage is heated and cooled using geothermal energy. This includes over 350,000 square feet and the equivalent of 849 vertical well loops on the campus. State Technical College of Missouri has received over $150,000 in rebates as a result of the Ground Source Heat Pump (GSHP) Program. Many Missouri taxpayer dollars are being saved due to these lower operating costs.
The college uses other alternative fuels besides geothermal energy. In one building not supported by the geothermal system, the furnace burns the college’s used motor oil. Additionally, the college recycles cooking oil to burn in fuel oil furnaces; uses setback thermostats, motion detectors for lighting systems, and biodegradable products; recycles refrigerants, solvents, metals, paper, plastic, and other materials; and reuses equipment components and parts for training.

Beginning in 2001, the college has incorporated Leadership in Energy and Environmental Design (LEED) standards into all new construction plans and projects.

For information on how green technology is incorporated into the college’s academic programs, refer to the program descriptions in the curriculum portion of this catalog.

Classrooms And Laboratories
The college’s main campus is located in central Missouri on approximately 360 acres one mile east of Linn and 25 miles east of Jefferson City. The Advanced Manufacturing Technician program is located in St. Charles, Missouri at the Lewis & Clark Career Center.

Main Campus
The main campus consists of eleven academic buildings, a student housing complex, an activity center, and an airport. The newest academic buildings on the main campus include the 20,000 square foot Utility Technology Center and the 21,000 square foot Health Science Center (HSC). Other buildings on the main campus contain specialized technical laboratories, classrooms and faculty offices. In total the main campus and outdoor laboratories support over 25 technical programs.

Contemporary cottage-style student housing is available for State Technical College of Missouri students. Rooms are single-or double-occupancy with private bath. Rooms are furnished with beds, desks, desk lamps, closets, a Micro-Fridge, Wi-Fi, local cable, and telephone connections.

The 72,000 square foot activity center opened its doors in January 2008. The main level includes three regulation size basketball courts, a game room, arcade area, cardio room, locker rooms, and food available at scheduled hours in the Orbit Lounge. The second level has an elevated three lane walking/running track. The basement of the facility contains a fitness center for weight lifting, cardio, and fitness classes and an indoor archery range. The basement also serves as a FEMA approved tornado/safe shelter.

The college also provides airport facilities consisting of a pilot/radio controlled lighting of a 3,400 X 60 foot paved runway, taxi way, tie down area, a two 10-unit nested T-hangers for public rental, and an AVGAS fueling station that accepts all major credit cards.

Business & Industry Training
The Business & Industry Department provides a number of credit and noncredit class offerings that serve the demands of industry, institutions, the local community, and individuals. Classes are offered in the evening and during the day. Class offerings do not necessarily coincide with the college’s academic calendar. Individuals interested in obtaining more information should contact the Business & Industry Department.

Lewis & Clark Career Center
The Advanced Manufacturing Technician program is offered at the Lewis & Clark Career Center location at 2400 Zumbehl Road, St. Charles, Missouri 63301. The phone number is (573) 443-4936. Graduates of the Advanced Manufacturing Technician program earn an Associate of Applied Science degree in Automation & Robotics Technology.
Osage County Community Center
The Osage County Community Center is adjacent to State Technical College of Missouri. It provides the citizens of Osage County and college students with an assembly hall and space for civic and educational programs.

The building contains 11,000 square feet of space, including a 3,200 square-foot auditorium with catering kitchen and two conference rooms for hosting meetings and training sessions. While the building is designed to function as a business and public conferencing/meeting center, it also supports college and community social events. The center is managed by State Technical College of Missouri.

Osage Country Club
The Osage Country Club is a public golf course with tree lined, bermuda grass fairways and bent grass greens. The club is located in Linn, Missouri. The golf course offers three sets of tees to accommodate golfers of every skill level. For members and guests, there is a swimming pool that overlooks the golf course and can be taken advantage of all summer.

Foundation For State Technical College Of Missouri
The Foundation for State Technical College of Missouri is a not-for-profit 501(c)(3) tax-exempt organization and serves as the college’s principle fundraising organization. Funds received by the Foundation are used to provide scholarships, fund faculty development, purchase instructional equipment, construct facilities and for other purposes that contribute to improvement of the college’s ability to accomplish its mission.

Inquiries of the Foundation can be directed to the Foundation for State Technical College of Missouri, One Technology Drive, Linn, Missouri 65051, or by email at foundation@statetechmo.edu.

CONSUMER INFORMATION
The Higher Education Act of 1965 (HEA), as amended by the Higher Education Opportunity Act of 2008 (HEOA), requires colleges to disclose information to potential and current students and employees. Required disclosures regarding institutional information, financial aid, family educational rights and privacy act, campus security, and student right to know information are found at https://www.statetechmo.edu/consumerinformation/.

GENERAL ADMISSIONS POLICY AND PROCEDURES
Admissions Policy
State Technical College of Missouri is an open/selective enrollment institution with programmatic selectivity. Students who meet the college’s minimum threshold scores on college-level placement tests and have a diploma from an accredited high school or high school equivalency (HSE) credential will be accepted into the college. Admission of a student to a program at State Technical College of Missouri will be based on minimum scores on appropriate college-level placement tests, meeting program specific requirements, and program availability. Students may be placed in developmental courses based on college-level placement test results.

Campus Tours
Prospective students and their families are encouraged to contact the Office of Admissions at 800-743-8324 or www.statetechmo.edu to schedule a campus tour. Campus tours are offered daily, Monday-Friday.
The Coordinating Board For Higher Education-Recommended College Preparatory High School Core Curriculum
State Technical College of Missouri recommends the Coordinating Board for Higher Education (CBHE) Minimum 24-unit High School CORE Curriculum for its entering first-year students:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Units</th>
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<tbody>
<tr>
<td>English/Language Arts</td>
<td>4 units</td>
</tr>
<tr>
<td>Social Studies</td>
<td>3 units</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4 units*</td>
</tr>
<tr>
<td>Science</td>
<td>3 units</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>1 unit</td>
</tr>
<tr>
<td>Additional Coursework</td>
<td>3 units**</td>
</tr>
<tr>
<td>Electives</td>
<td>6 units***</td>
</tr>
</tbody>
</table>

* At least one mathematics course should be taken each year. It is particularly important that students take a mathematics course in grade 12.

** Missouri public high school students are required by the State Board of Education to complete units in practical arts (1), physical education (1), health education (1/2), and personal finance (1/2).

*** All students should complete at least 3 total elective units in foreign language and/or other courses within high school core content areas defined below. Two units of a single foreign language are strongly recommended.

For each high school core content area, descriptions follow that provide illustrations of coursework acceptable and unacceptable for the high school core curriculum.

**English/Language Arts – 4 units**
- English/language arts coursework (4 units) emphasizes college preparatory composition, research skills, analysis of literature, and other content of comparable or greater rigor. Speech and debate courses may be included.
- Coursework not acceptable for the high school core curriculum emphasizes student publications, broadcast media, or theater.

**Social Studies – 3 units**
- Social studies coursework (3 units) emphasizes American history, Missouri government and Missouri history as required by state statute, geography/world civilizations, and other content of comparable or greater rigor.
- Coursework not acceptable for the high school core curriculum emphasizes family/human development or consumer education.

**Mathematics – 4 units**
- Mathematics coursework (4 units) emphasizes college preparatory algebra and other content of comparable or greater rigor. Students who complete algebra prior to the freshman year would be expected to complete four additional units in grades 9-12. Students who achieve a proficiency score of 3 or 4 on the Smarter Balanced grade 11 assessment must demonstrate continued study of mathematics for the score to be considered valid in the first year of college.
- Coursework that emphasizes pre-algebra, computer math/programming, consumer/basic math, or business math/accounting is not acceptable for the CBHE Recommended College Preparatory High School core curriculum.

**Science – 3 units**
- Science coursework (3 units) emphasizes college preparatory biology, chemistry, and other content of comparable or greater rigor. Science coursework should include at least one laboratory course.
- Coursework not acceptable for the high school core curriculum emphasizes general or consumer science.
Fine Arts – 1 unit

♦ Fine arts coursework (1 unit) emphasizes visual arts, instrumental or vocal music, dance, theater, or other content of comparable or greater rigor. Critical analysis, theory, or “appreciation” courses may be included.
♦ Coursework not acceptable for the high school core curriculum emphasizes speech, debate, or broadcast media.

Admissions Procedures
Every prospective student will work with the Office of Admissions throughout the testing, application, and registration process. The Office of Admissions is the prospective student’s personal resource at the college and is available to assist the prospective student with his/her transition to college life. Contact the Office of Admissions at 800-743-8324. Prospective students may apply online at www.statetechmo.edu.

Admission decisions are based on the current admission policy and are in accordance with the college’s standard practices on equal opportunity. Under each category below, the items listed are the minimum requirements for admission evaluation. Any applicant who has questions concerning the admissions procedures should contact the Office of Admissions at 800-743-8324.

Resident Status
The Missouri Department of Higher Education has issued regulations to be applied by Missouri colleges and universities to determine the resident status of students in the Code of State Regulations Chapter 3 – Residency and Transfer Title 6 CSR 10-3.010. This regulation is available at https://www.sos.mo.gov/cmsimages/adrules/csr/current/6csr/6c10-3.pdf. The burden of proof in establishing residency rests with the student. Students who are legal minors or tax-dependents whose parents reside outside the state of Missouri are not eligible for resident fee paying status. One can be classified as a resident for fee purposes immediately upon moving to the state if the move is to accept full-time employment (or if one is the dependent of someone who came to Missouri to accept full-time employment.) In other situations, continuous domiciliary presence in the state for 12 months must be proven AND sufficient proof of intent to be domiciled in Missouri permanently must be provided:

♦ Attesting to Missouri residency for the previous twelve (12) months on the State Technical College of Missouri Application for Admission.
♦ Providing written documentation that proves the student is a bona fide resident of Missouri. Proof of residency must include, but is not limited to:
  ✓ He/She must be a U.S. citizen or possess a green card from the INS.
  ✓ Once the U.S. citizenship is documented, he/she must provide either a copy of the previous year Missouri State Tax Return for themselves (or parents if the student has not received wages in Missouri) or a copy of 12 consecutive pay stubs identifying wages earned and Missouri State taxes paid.

NOTE: Questions concerning the status of residency should be referred to the Office of Admissions.

Student Classifications And Application Requirements
A student can be admitted to State Technical College of Missouri as either a degree seeking student or a non-degree seeking student.

Degree Seeking Students (First-Time, Transfer, or Returning)
A degree seeking student has determined that his/her goal is to attain an associate of applied science degree or a certificate from State Technical College of Missouri.

Application Requirements
♦ Complete the State Technical College of Missouri Application for Admission.
♦ Education Record* – Submit all that apply to you:
  1. Official eight-semester high school transcript.
     ✓ High school students will be given tentative admission based on a sixth or seventh semester transcript.
A final transcript must be submitted after high school graduation. OR
2. A home-school transcript. OR
3. Official passing HiSET/GED score report.
   ✓ Missouri HiSET/GED score reports will be obtained online by the Office of Admissions. Fax copies are not accepted. Graduates outside of Missouri should request that the State Department of Education in the capital city of the state in which they tested send an official copy of their high school equivalency score report to the Office of Admissions. OR
4. Official college transcript(s).
   ✓ If the applicant has earned 24 or more college semester credits from an accredited higher education institution, submit only the official college transcript(s).
   ✓ If the applicant has earned less than 24 college semester credits from an accredited higher education institution, submit both the official college transcript(s) and official high school transcript or official passing high school equivalency score report.

* Applicants who do not have an Education Record should contact the Office of Admissions.

♦ Provide ACT, SAT, Next Gen, and/or ACCUPLACER test scores.
1. Test scores must meet State Technical College of Missouri’s minimum threshold scores for admission to the college.
2. Test scores are used for course placement and program admittance.
3. Results from these tests must be less than five years old. The ACCUPLACER tests are offered on the State Technical College of Missouri’s main campus and St. Charles location for a nominal fee. Contact the Testing Center to schedule a test appointment or to inquire about scheduling testing closer to your location. Special test accommodations are available upon request with proper documentation.
4. If test results are over five years old and the applicant can demonstrate successful prior college experience, he/she may have testing waived per the discretion of the Director of Admissions.
5. Test scores may be waived with approved transfer credit.

♦ Submit any program-specific requirements. Contact the Office of Admissions for more details.

Students Declaring a Major
Students declaring a major who are accepted to the college and admitted into a degree or certificate program may receive federal financial aid if eligible.

Students with No Major
A student with no major is degree seeking but does not have a major for one of the following reasons:
♦ The student does not meet desired program requirements and enrolls in general education classes in order to meet requirements.
♦ The student’s desired program is full and the student enrolls in general education classes with plans to enter the program when space is available.
♦ The student is truly undecided but wants to complete a degree at State Technical College of Missouri.

NOTE: Enrolling at State Technical College of Missouri as a student without a major may lengthen the time it takes to complete a degree.

If a student is taking preparatory coursework to gain admittance into an eligible program, the student may receive Federal Stafford and PLUS loans, if eligible, for one consecutive 12-month period. Class work taken during this time must be required for their desired degree program. Students are not eligible for other federal aid such as Federal Pell Grants and College Work Study until they have been admitted into an eligible degree or certificate program.
Students with Dual Majors

Students who desire to pursue multiple majors need to be aware that courses will be offered in the same sequence and semester that they are regularly taught. Students with dual majors should expect the completion of multiple majors to take longer than two years and will be responsible for consulting the Office of Financial Aid regarding their financial aid eligibility and options.

International Students

An international student is a foreign-born person, who is not a citizen, national or permanent resident of the United States. International students typically live outside of the United States, but may be residing in the United States on a non-immigrant visa. Applicants who have applied for residency or citizenship must provide all application materials necessary to be considered for international admission until residency or citizenship has been granted. The college does not extend admission to undocumented persons (students who are granted classification as Deferred Action for Childhood Arrivals (DACA) are exceptions). In either case, a student who is not a citizen, national, or permanent resident of the United States is considered an international student and must follow the Admissions process for international students. An international student must be degree seeking and admitted into his/her desired degree program. International students will be issued a Certificate of Eligibility (I-20) only after completing and/or submitting the following information:

For students living outside the United States:

♦ Complete the State Technical College of Missouri Application for Admission.
♦ Provide evidence of academic preparation:
  1. The student must submit all official school records verifying scholastic preparation (e.g. graduation certificate and/or transcript from an accredited high school or foreign equivalent and college transcript). An official English translation and evaluation of the transcript must be submitted in addition to the original. Educational Credential Evaluators (ECE), International Education Research Foundation (IERF), and World Education Services (WES) are approved professional translation and evaluation services; applications can be found online at www.ece.org, www.ierf.org, and www.wes.org. Students are responsible for any fees for these services. Evaluation of credentials completed by ECE, IERF, and WES are subject to review and approval by the Registrar.
  2. Students transferring from another U.S. college or university need to submit their current I-20, I-94, visa, and copy of valid passport.
♦ Submit evidence of financial responsibility and an affidavit of financial support guaranteeing the prospective student’s ability to pay fees and living expenses in the United States while attending school.
♦ Submit ACT, SAT, Next Gen, and/or ACCUPLACER test scores.
  1. Test scores must meet State Technical College of Missouri’s minimum threshold scores for admission to the college.
  2. Test scores are used for course placement and program admittance. For information about taking an arranged ACT test, visit www.act.org/content/dam/act/unsecured/documents/arranged.pdf.
  3. Results from these tests must be less than five years old.
  4. If test results are over five years old and the applicant can demonstrate successful prior experience at an accredited U.S. college or university, he/she may have testing waived per the discretion of the Director of Admissions.
  5. Test scores may be waived with approved transfer credit.
♦ Provide evidence of English language proficiency:
  International students who are from countries where English is not an official language and/or were not schooled in English must submit evidence of English proficiency. This requirement may be satisfied by providing one of the following:
  ✓ A score of 550 or better on the paper-based Test of English as a Foreign Language (TOEFL) or a score of 80 on the internet-based TOEFL. Submit official test report.
  ✓ A score of 6.0 or better on the International English Language Testing System (IELTS).
  ✓ Satisfactory completion of 60 semester hours of academic work in a regionally-accredited U.S. college or university. Submit official transcript.
♦ Submit any program-specific requirements. Contact the Office of Admissions for more details.

For students living within the United States:
Be eligible to change to F-1 status. See United States Citizenship and Immigration Services (USCIS) website to see if you are eligible to change your status.

Complete all of the State Technical College of Missouri Application for Admission steps listed above.

NOTES:
- International students will be required to submit evidence of health and accident insurance prior to enrollment.
- International students must pay all fees necessary for issuing the I-20.
- International students must pay all tuition and fees in full at the time the student is permitted to register for classes unless guaranteed by the country’s scholarship program.
- International students may be eligible for internal tuition waivers provided by State Technical College of Missouri.
- International students are eligible to begin programs in the fall semester only and must apply to the college no later than May 1 or the specific program deadline (many of which are earlier than May 1).
- Questions about any of the above materials may be directed to the Office of Admissions.

Non-Degree Seeking Students
Students who wish to take classes, but do not wish to pursue a degree may be permitted to enroll under non-degree seeking student status.

These Students:
- Must complete the State Technical College of Missouri Application for Admission.
- May take credit, non-credit and/or dual credit/enrollment classes on a space-available basis.
- Are not eligible for federal financial aid.

When a non-degree seeking student wishes to take math, communication, social science, and/or science credit classes, the student must then provide ACT, SAT, Next Gen, and/or ACCUPLACER test scores. However, all dual credit and dual enrollment high school students taking any college credit classes must provide ACT, SAT, Next Gen, and/or ACCUPLACER test scores at the time they enroll.

1. Test scores are used for course placement and program admittance.
2. Results from these tests must be less than five years old. The ACCUPLACER tests are offered on the State Technical College of Missouri’s main campus and St. Charles location for a nominal fee. Contact the Testing Center to schedule a test appointment or to inquire about scheduling testing closer to your location. Special test accommodations are available upon request with proper documentation.
3. If test results are over five years old and the applicant can demonstrate successful prior college experience, he/she may have testing waived per the discretion of the Director of Admissions.

When a non-degree seeking student decides to seek a degree or certificate at State Technical College of Missouri, he or she must complete the State Technical College of Missouri degree seeking student application requirements described earlier.

TUITION, FEES, AND OTHER COSTS
A college education is one of the most important investments a student will make. State Technical College of Missouri is committed to providing access to everyone who can benefit from a program of higher education. The costs of attending State Technical College of Missouri and Financial Aid assistance available are outlined below.

The Board of Regents is responsible for the establishment of tuition, fees, and other academic costs. College fees, miscellaneous fees, and costs are subject to change without notice by action of the State Technical College of Missouri Board of Regents. Refer to the State Technical College of Missouri website at https://www.statetechmo.edu/tuition-fees/ or call the Financial Services Coordinator at (573) 897-5121 for current tuition, fees, and other costs. The Financial Services Coordinator’s Office is located in the Information Technology Center next to the Library.

Students are effectively responsible for tuition and fees on the date of registration and remain responsible unless the appropriate withdrawal paperwork is completed within the timeframe allowed.
Tuition
Tuition is determined by the student’s residency classification, the number of semester hours of enrollment, method of delivery, and program.

Fees
Fees are determined by the number of semester hours of enrollment, method of delivery, and program. Funds from fees help support program expenses associated with equipment, material, supplies, technical assessment, student activities, and support services. Current fee information can be found on the State Technical College of Missouri website at https://www.statetechmo.edu/tuition-fees/.

State Technical College of Missouri drug screens students in Industrial Electricity, Aviation Maintenance, any program requiring a commercial driver’s license, and programs that require clinical work. Drug screening fees are charged to students in these programs who are newly classified as degree or certificate seeking, and degree or certificate seeking students returning after one or more semesters of non-enrollment.

Programs may have specific fees in addition to the fees described above. Make sure to inquire about the program you are interested in.

Costs of books, tools, and supplies vary by program. Refer to the State Technical College of Missouri website at https://bookstore.statetechmo.edu/college or contact the State Technical College of Missouri Bookstore at (573) 897-5124 for current costs.

Some programs require uniforms. Refer to the State Technical College of Missouri website at https://www.statetechmo.edu/programspecificcosts/ or call the Financial Services Coordinator at (573) 897-5121 for current uniform costs. The Financial Services Coordinator’s Office is located in the Information Technology Center next to the Library.

Bookstore
All required books, tools, and supplies are available for purchase at the State Technical College of Missouri Bookstore, located in the lower level of the Information Technology Center. Costs of books, tools, and supplies vary by program. Current cost information can be found at https://bookstore.statetechmo.edu/college.

Students may have qualifying financial aid or third party funding available to purchase books and supplies from the bookstore. To utilize this funding, students can obtain a bookstore voucher from the Financial Services Coordinator’s Office located in the Information Technology Center next to the Library. Students must have all financial aid documents completed to be eligible for a voucher, and vouchers are only available during the first two weeks of each semester.

Tool sets used in State Technical College of Missouri programs are available for purchase at the State Technical College of Missouri Bookstore. Tool sets will be ordered once payment in full has been made. For more information visit https://bookstore.statetechmo.edu/college or call (573) 897-5124.

Housing
Student housing is available on the main campus for students enrolled at State Technical College of Missouri. Rooms are available as single or double occupancy. To apply for on-campus housing, complete the Housing Agreement and Roommate Matching forms found at https://www.statetechmo.edu/campus-services/housing/housing-application-process/. Return completed forms and required deposit to State Technical College of Missouri. Housing rates are adjusted for students enrolled in required internships. Additional information about main campus housing including fees may be found at https://www.statetechmo.edu/campus-services/housing/ or by contacting the Resident Manager at (573) 897-5165.

Meal Plans
Students living on-campus are required to purchase meal plans, and the cost of the plan is added to the student’s account. Meal plans are non-refundable. Visit https://www.statetechmo.edu/campus-services/cafeteria/mealplans/ for more information about the meal plans, including to-go food options that are available for purchase. Commuter students may purchase a meal plan by visiting the Financial Services Coordinator Office in the Information Technology Center next to the Library or by calling (573) 897-5121.
Payment Of Tuition And Fees
Payment of tuition and fees for each semester is due by the first day of classes in the semester. The student is responsible for all charges incurred. If all financial aid documents have not been completed, student account balances may not reflect financial aid. Questions regarding student account balances should be directed to the Financial Services Coordinator in the Information Technology Center next to the Library or by calling (573) 897-5121. Payments may be made by Visa, Mastercard, Discover, American Express, personal check, cashier’s check, US Money Order, or cash. Students can choose to pay 100% of the balance or may set-up an Interest-Free Monthly Payment Plan (see below). If the student’s account balance is not paid within 30 days of the first day of class in the semester and a payment plan has not been established, the student may be dropped from classes, and a monthly finance charge of 2% will be applied to the balance until it is paid in full. Unpaid balances will prevent students from enrolling in future semesters. Delinquent accounts will be sent to collections and collection fees incurred are the responsibility of the student.

Interest-Free Monthly Payment Option
Students can choose to pay the balance of the student account by setting up an interest-free monthly payment plan. Payment plans are set-up by semester and only student account balances are eligible to be set-up on the payment plan. Payment plan payments are due on the first day of each month. Late fees of 2% will be assessed if payments are not received by the 15th of the month. The student’s account balance must be paid in full by the end of the semester to register for a subsequent semester. To enroll in the Interest-Free Monthly Payment Plan Option, visit the Financial Services Coordinator Office located in the Information Technology Center next to the Library or call (573) 897-5121.

Third-Party Agency
If a student’s cost of education is being paid by a third-party agency, there must be an agreement among the student, college, and a third-party agency. The agency is an outside source that takes responsibility for all or partial payment of tuition, fees, books, and other costs of attending State Technical College of Missouri. A third-party agency is not an individual, such as a parent or grandparent, but a company or agency such as a branch of the U.S. Military, Vocational Rehabilitation, Training Rehabilitation Act (TRA), Workforce Investment Act (WIA), or other organization. Third-party agencies will only pay authorized charges.

The Office of Financial Aid must receive written approval from the third-party agency for each semester the student attends State Technical College of Missouri. The college will bill the third-party agency for authorized charges. If the agency fails to pay the charges, the student is responsible for the balance. If billed tuition and fees are reduced creating a refund, the paying agency will receive the refund or credit. Refund calculations may vary by third-party agency.

Students receiving Chapter 31 or Chapter 33 funds from the U.S. Department of Veteran Affairs (VA) will not receive a penalty including assessment of late fees, denial of access to classes, libraries or other institutional facilities, or be required to borrow additional funds to cover their financial obligation to the institution due to the delayed disbursement of payment by the VA.

Return Check Policy
Any personal check returned by the bank to State Technical College of Missouri for any reason will be charged a $40 fee. This fee will be charged to the student’s account. Returned checks must be redeemed promptly after notification. Students who do not redeem checks promptly may be subject to dismissal from the college. Returned checks that are not redeemed promptly will be sent to the local prosecuting attorney for collection. The college reserves the right to refuse to accept any check.

Refunds

Refunds For Dropped Classes
Students who drop classes within the published timeframe are entitled to a refund. A completed Add/Drop Form, which is available at the Academic Records Office or on EagleOnline at https://eagleonline.statetechmo.edu/ics on the Student Information tab, must be submitted in a timely manner to the Academic Records Office in order to drop a class. The date the completed form is received by the Academic Records Office is the date used to determine eligibility for refunds and/or final approval of the classes dropped.
Students who drop class(es) by submitting the appropriate, completed forms will receive refunds according to the following schedule. Refer to the Financial Refund and Add/Drop Dates released each semester for actual dates.

16-Week Class:
- 1st week of class: 100% Refund
- 2nd week of class: No Refund

♦ Any class not on a 16-week schedule will be prorated based on the above schedule.
♦ Students may change sections of the same class with the approval of the instructor(s). There is no cost for changing from one section to another section scheduled within the same semester, however, students who receive approval to change from a classroom to a web-based section of a class will be required to pay the additional cost per credit for web-based classes.

Administrative Withdrawal From A Class
Students who never attend or cease to attend any class in which they have enrolled may be administratively withdrawn. Students may also be withdrawn from a class by administrative action as a result of disciplinary procedures. Students may be financially responsible for charges incurred under these circumstances.

If State Technical College of Missouri cancels a class for any reason, students will receive a full refund for that class.

Fees that are not refundable include:
- Meal Plans
- Seminar Fees
- Drug Screening Fees

Student Housing Related Refunds
Please refer to the housing agreement you signed for the policy regarding housing and housing deposit refunds. A copy of this agreement may be obtained from the Resident Manager at (573)-897-5165 or online at https://www.statetechmo.edu/wp-content/uploads/2018/04/Housing-Agreement-2018-1.pdf. Refunds of housing deposits are always made payable to the student as the agreement is between the student and State Technical College of Missouri.

Credit Balance Refunds
If a student account has a credit balance resulting from excess financial aid, a refund will be processed within 14 days of the date the student’s account reflects a credit balance. Any credit balance created by a third party payment will not be processed until the third party has paid the balance on the account or until funds are secured.

Bookstore Refunds
- **Book Refund/Exchange:** As long as returned in the semester they were purchased, books may be returned if they are unused and in the original package. Books from previous semesters cannot be returned or exchanged.
- **Tool Refund/Exchange:** Tools may not be returned or exchanged.
- **Supply Refund/Exchange:** Supplies may be returned or exchanged as long as they have not been used.

Military Deployment Refund
Students who are called to active military duty have the option of withdrawing from classes and receiving a 100% refund or taking incomplete grades and re-enrolling within six months after being released from military duty.

Student Financial Appeal Petition
A student who believes he or she is entitled to a refund greater than the amount calculated or would like to dispute a charge may complete a Student Financial Appeal Petition, attach the required documentation, and submit the petition to the Financial Services Coordinator’s Office in the Information Technology Center next to the Library. The petition must be completed during the semester of the occurrence in question.
Financial Aid Impacts Of Class Withdrawals

Return Of Title IV Funds
The Higher Education Amendments of 1998 Public Law 105-244 dictates the formula for calculating the amount of aid a student and school may retain when the student totally withdraws from all classes. If students withdraw up through the 60% point in each payment period or period of enrollment, the school must determine the amount of Title IV funds the student has earned at the time of withdrawal. After the 60% point in the payment period or period of enrollment, a student has earned 100% of the Title IV funds.

The college encourages students to read this procedure carefully. If the student is thinking about withdrawing from all classes PRIOR to completing 60% of the semester, he/she should contact Financial Aid to understand how withdrawing will affect financial aid.

This procedure shall apply to all students who withdraw from State Technical College of Missouri and receive financial aid from Title IV funds:

a. The term “Title IV Funds” refers to the federal financial aid programs authorized under the Higher Education Act of 1965 (as amended) and includes the following programs:
   - Unsubsidized Direct Stafford Loan
   - Subsidized Direct Stafford Loan
   - Direct PLUS Loans
   - Federal Pell Grants
   - Federal SEOG

b. A student’s withdrawal date is the student’s last date of attendance at a documented, academically-related activity. Attendance information is collected from faculty to verify financial aid eligibility. If the student is not attending classes, he/she is required to complete the official withdrawal process of the college. Students who do not attend classes for two weeks and do not officially complete the withdrawal process, will be administratively withdrawn. The student’s last date of attendance will be used for administrative withdrawals.

Title IV aid is earned in a prorated manner on a per diem basis up to and including the 60% point in the semester. Title IV aid is viewed as 100% earned after that point in time.

a. The percentage of Title IV aid earned shall be calculated as follows: Number of days completed by student ÷ total number of days in the term (not counting breaks that include at least five consecutive days) = the percentage of aid earned. For clock hour programs the percentage of Title IV aid earned is calculated by the number of clock hours scheduled to be completed ÷ total number of clock hours in the term (not counting breaks that include at least five consecutive days).

b. The percentage of Title IV aid unearned shall be 100% minus the percentage earned.

c. Unearned aid shall be returned first by State Technical College of Missouri from the student’s account calculated as follows: Total institutional charges times the percentage of unearned aid equals the amount to be returned to the program(s). Unearned Title IV aid shall be returned in the following order:
   1. Unsubsidized Direct Stafford Loan
   2. Subsidized Direct Stafford Loan
   3. Direct PLUS Loans
   4. Federal Pell Grant
   5. Federal SEOG
   6. Other assistance under Title IV for which a return of funds is required.

d. When the total amount of unearned aid is greater than the amount returned by State Technical College of Missouri from the student’s account, the student is responsible for returning unearned aid to the appropriate program(s) as follows:
   1. Unsubsidized Direct Stafford Loan *
   2. Subsidized Direct Stafford Loan *
   3. Direct PLUS Loans
4. Federal Pell Grant **
5. Federal SEOG **
6. Other Title IV Grant Students **

* Loan amount is to be repaid in accordance with the terms of the promissory note.
** Amounts to be returned by the student to federal grant programs will be 50% of the amount owed.

NOTE: State Technical College of Missouri will return any grant money owed by the student to the grantor. The student will be responsible for reimbursing any grant money to the college that is returned on his/her behalf.

Unearned aid must be returned by State Technical College of Missouri as soon as possible, but no later than 45 days after State Technical College of Missouri has determined that the student withdrew.

If a student has not received all of the financial aid they have earned at the time of withdrawal, the student may be due a post-withdrawal disbursement. If a post-withdrawal disbursement includes a student loan(s), State Technical College of Missouri must obtain the borrower’s permission before the loan can be disbursed. Students may choose to decline or reduce loan funds.

Refunds and adjusted bills will be sent to the student’s accounts receivable address following withdrawal. The student is responsible for any portion of his/her institutional charges that are left outstanding after Title IV (Financial Aid) funds are returned. A student with a past due balance will have a business hold placed on his/her records. If payment is not made, the student’s account may be turned over to a collection agency, which may affect his/her credit rating.

Refunds on all institutional charges, including tuition and fees, will be calculated using the refund policy published in this catalog.

Institutional and student responsibilities in regard to the return of Title IV funds.

a. State Technical College of Missouri’s responsibilities in regard to the return of Title IV funds include:
   ✓ Providing each student with the information given in this policy.
   ✓ Identifying students who are affected by this procedure and completing the Return of the Title IV Funds calculation for those students.
   ✓ Returning any Title IV funds that are due to the Title IV programs within 45 days of the withdrawal.
   ✓ Determining the withdrawal dates for students who withdraw without notification. If a student does not officially withdraw and fails to earn a passing grade in at least one class, for financial aid purposes, State Technical College of Missouri will assume the student has unofficially withdrawn. The student’s last date of attendance will be used for the return calculation.
   ✓ Notifying students of the result of withdrawal in regard to their financial aid.

b. The student’s responsibilities in regard to the return of the Title IV funds include:
   ✓ Becoming familiar with the Return of Title IV funds procedure.
   ✓ Understanding the college’s official withdrawal process.
   ✓ Repaying to the Title IV programs any funds that were disbursed directly to the student and which the student was determined to be ineligible based on the Return of Title IV Funds calculation.

State Technical College of Missouri will notify the student of the amount of any federal grant overpayment. The student must repay the amount in full to State Technical College of Missouri. The college will then repay the U.S. Department of Education. The student must complete these arrangements within 45 days of notification of the overpayment status or risk losing eligibility for future Title IV assistance.
STATE TECHNICAL COLLEGE OF MISSOURI

STUDENT FINANCIAL AID
To help defray costs of attending college and to meet other personal expenses, a variety of financial aid programs are available. Eligibility criteria vary from program to program, but common to all federal programs is the establishment of financial need. To receive financial aid, a Free Application for Federal Student Aid (FAFSA) must be completed and processed to determine financial aid eligibility.

Eligibility Criteria
In order to participate in aid programs, the student must be able to demonstrate the following eligibility criteria:

A. Applicant must be a U.S. citizen, or a national in the process of gaining citizenship;
B. Applicant must be accepted by the college as a degree/certificate-seeking student;
C. Applicant must have either a high school diploma, passed a high school equivalency test such as HiSET or General Education Development (GED), or have been home-schooled.

NOTE: Students not meeting these requirements will be ineligible for financial aid.

Students who are admitted with no major may receive Federal Stafford and PLUS loans for one consecutive 12-month period. Class work taken during this time must be necessary for enrollment in their desired degree program. Students are not eligible for other federal aid such as Federal Pell Grants and College Work Study until they have been admitted into their desired degree program.

Satisfactory Academic Progress
According to federal regulations, students must make satisfactory academic progress to remain eligible for financial aid. To remain eligible for financial aid, students must maintain an overall semester Grade Point Average (GPA) of 2.000 or above on a 4.000 scale. Students must also satisfactorily earn a minimum number of credits applicable toward their degree each semester:

<table>
<thead>
<tr>
<th>Enrollment Status</th>
<th>Number of Hours Attempted</th>
<th>Number of Hours Required to Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>12 or more</td>
<td>9 hours</td>
</tr>
<tr>
<td>Three-Quarters (3/4)</td>
<td>9-11 hours</td>
<td>6 hours</td>
</tr>
<tr>
<td>Half-Time (1/2)</td>
<td>6-8 hours</td>
<td>6 hours</td>
</tr>
<tr>
<td>Less than half-time</td>
<td>1-5 hours</td>
<td>100%</td>
</tr>
</tbody>
</table>

Grades of withdrew (WD), audit (AU), and incomplete (I) are considered unsatisfactory.

Withdrawal and Incomplete grades do count as hours attempted for financial aid purposes. Repeat classes are considered as hours attempted and completed for financial aid. Non-credit remedial classes do not count as hours attempted or completed for financial aid purposes. Credit hours from another institution that are accepted as transfer credit towards the student’s educational program count as both attempted and completed hours. Academic progress of financial aid recipients will be reviewed at the end of each semester in credit hour programs. Clock hour program aid recipients will be reviewed after completion of 450 clock hours. Students who maintain satisfactory academic progress remain eligible for financial aid. Students who do not meet the Satisfactory Academic Progress requirements will be mailed a notice to their address on file with the State Technical College of Missouri Academic Records Office.

Students who fail to meet one or more of the satisfactory academic progress requirements will be placed on financial aid warning for one semester. Students failing to meet the satisfactory academic progress requirements at the end of their warning semester will be denied financial aid. Students who lose their financial aid eligibility may regain eligibility once they complete a minimum of 6 credit hours at State Technical College of Missouri with an overall semester GPA of 2.000 on a 4.000 scale without financial aid assistance. When students regain financial aid eligibility after being denied financial aid, they will return on financial aid warning.

Students believing they have mitigating circumstances that prevented them from maintaining satisfactory academic progress may request an exception by explaining their circumstances in writing with supporting documentation to the Office of Financial Aid. Denied requests may be appealed by using the College’s grievance procedure. If an appeal is granted, students will return on financial aid probation.
Students who attend State Technical College of Missouri without financial assistance, and then apply for assistance, will have to meet the satisfactory progress standards as if they had received assistance from the beginning of their attendance at State Technical College of Missouri.

Students who maintain the standard for academic progress are allowed to receive aid until the maximum credit hour or clock hour limit is reached or the requirements for a current declared major are reached. Students cannot receive financial aid if they have attempted more than 150% of the credit hours or clock hours required for their degree or certificate. A student is ineligible when it becomes mathematically impossible for the student to complete their program within 150% of the length of the program. For example in a credit hour program, in successfully completing a 72 credit hour curriculum, the maximum credit hours for student aid utilization is 108 credit hours. For clock hour programs, students must complete their program within 150% of the time it normally takes to complete their certificate program, as measured in weeks. For example, if a student is enrolled in a 1,300 clock hour program scheduled to last 40 weeks, the maximum time frame for a student to complete the program is 60 weeks (40 x 150%). The student must complete 22 hours per week in order to complete 1,300 hours in 60 weeks.

**Federal Verification**
In the financial aid process, if an applicant is selected for verification, the Office of Financial Aid is required to collect and review certain documents to determine data accuracy. If selected, the student will be notified that a review is required and informed of the documents needed. No award will be made prior to satisfactory completion of verification procedures and failure to provide documentation will result in suspension of student aid processing.

**Proof Of Citizenship**
The State of Missouri (HB390) requires any student receiving institutional financial aid and state administered grants and scholarships to provide proof of their citizenship to the Office of Financial Aid prior to receiving funds. This proof may be received electronically from the results of a valid FAFSA form. Examples of acceptable documentation include a state-issued driver’s license, state-issued non-driver’s identification cards, or a U.S. birth certificate. Students who need to provide official documentation to the Office of Financial Aid will be notified.

**Forms Of Aid**
State Technical College of Missouri participates in the following programs:
- Federal Pell Grant
- Federal Supplemental Education Opportunity Grant (SEOG)
- Federal College Work Study
- Federal Direct Stafford Student Loan (subsidized and unsubsidized)
- Federal Direct Parent (PLUS) Loan
- Private/Alternative Loan (subject to lender approval)
- Displaced Homemakers and Single Parents
- Access Missouri Grant Program
- Missouri A+ Schools Program
- Missouri Higher Education Academic Scholarship Program (Bright Flight)
- Missouri Returning HEROES’ Education Act
- Fast Track Workforce Incentive Grant

Additional information and application forms are available from the Office of Financial Aid.

**Federal Pell Grant.** The Pell Grant is a federal financial assistance program for students who have a financial need according to the Pell Grant criteria. Students must be degree seeking to receive the Federal Pell Grant. To apply, the Free Application for Federal Student Aid (FAFSA) Form must be filled out, showing the State Technical College of Missouri code (004711). Within two weeks students will receive from the Department of Education a Student Aid Report (SAR). State Technical College of Missouri will receive the same information electronically.

**Federal Supplemental Education Opportunity Grant (SEOG).** This program is available to students with exceptional financial need. Once the Pell Grant has been processed, SEOG awards are provided to those students with the lowest expected family contribution based upon the availability of funds. Awards are issued at the discretion of the Office of Financial Aid.
Federal College Work Study. Jobs at the college are available to students who have financial need and who wish to earn a monthly paycheck by working a part-time job on campus. Students apply for work study by completing the Free Application for Federal Student Aid (FAFSA) form. If determined eligible, the college will notify the student to visit the Office of Financial Aid at the beginning of the semester for a job assignment. Jobs include food service, clerical work and maintenance, and are based on availability of funds.

*Federal Direct Stafford Student Loan. This loan program allows students to borrow loans in their name at low interest rates. Students apply by completing the Free Application for Federal Student Aid (FAFSA) form. Through this program there is both a “subsidized” interest loan and an “unsubsidized” interest loan. The federal maximum for a first-year degree-seeking dependent student is $5,500, of which no more than $3,500 can be subsidized. Second-year degree-seeking dependent students may borrow a maximum of $6,500, of which no more than $4,500 can be subsidized. Independent students and dependent students whose parent is denied a PLUS loan due to credit, can receive up to an additional $4,000 unsubsidized loan funds. Students that are doing pre-requisite course work are eligible for $2,625. Repayment begins six months after leaving school with a fixed interest rate not to exceed 8.25 percent.

*Federal Direct Parent (PLUS) Loan. Parents of dependent students may borrow an amount not greater than the cost of education minus any student financial aid. Repayment starts 60 days after the loan has been fully disbursed. Parents may discuss deferment options with their lender. Parents must pass a credit check to be accepted for a PLUS loan. The interest rate is a fixed rate that will not exceed nine (9) percent.

Private/Alternative Loan. Students must apply for all federal financial aid prior to applying for a private loan. Students must apply with a lender to have a credit check run. Students who have little or no credit may need a credit-worthy co-signer. Students must be enrolled full-time and must be a student in good standing. Interest rates are variable and determined by the lender based on the borrower’s credit score. Most private loans start repayment six months after leaving college. Check with the lender regarding fees associated with the private loan.

*NOTE: Most Federal Student Loans will be credited to student accounts by electronic funds transfer (EFT) on the 31st day of each semester. Students will receive notification that their account has been credited by EFT and will be given the opportunity to cancel the loan(s) at that time.

Displaced Homemakers and Single Parents. Displaced homemakers and single parents may be able to apply for small grants. These grants are based on the availability of funding. See the Office of Financial Aid for criteria.

Access Missouri Grant Program. Missouri residents apply for this grant by completing the Free Application for Federal Aid (FAFSA). The FAFSA must be received by February 1 to be considered for this grant. Students must also be enrolled full-time, maintain a 2.500 cumulative grade point average, and have an Expected Family Contribution (EFC) figure below $12,000. (Based upon availability of state funding and subject to change by action of the Missouri General Assembly).

Missouri A+ Schools Program. State Technical College of Missouri participates in the A+ Program, created by the Outstanding Schools Act of 1993. Eligible students who have graduated from an A+ high school have incentive funds available that cover the standard tuition and fees that are assessed to every full-time student. Housing, books, course and program specific fees, tools, supply items, etc., are not reimbursed through the A+ Schools Program. A+ students are required to apply for Federal Financial Aid using the Free Application for Federal Student Aid (FAFSA) each year. Students must complete the financial aid process within the first 30 days each semester to ensure funding. (Based upon availability of state funding and subject to change by action of the Missouri General Assembly and guidelines received from the Missouri Department of Higher Education).

Missouri Higher Education Academic Scholarship Program (Bright Flight, Maximum $3,000 Award). To be eligible for a Bright Flight award, a high school senior must have a composite score on the American College Testing Program (ACT) or the Scholastic Aptitude Test (SAT) in the top three (3) percent of all Missouri students taking those tests. Students who score in the top five (5) percent may also qualify, contingent upon sufficient funding. Actual award amounts will be determined based upon students’ test scores and the amount of funds allocated.
Missouri Returning HEROES' Education Act. Students who served in armed combat after September 11, 2001 and were a Missouri resident at the time of entry into the military may qualify for reduced tuition of $50 per credit hour. The student must have served in a combat zone designated by the U.S. Department of Defense and have been honorably discharged from active duty to receive the reduced tuition rate. The student must maintain a 2.500 cumulative GPA and be enrolled in classes required for their degree or certificate to remain eligible for this waiver. Students who believe they are eligible for this waiver must submit Member Copy 4 of their DD214 to the Office of Financial Aid.

Fast Track Workforce Incentive Grant. This grant addresses workforce needs by helping adults pursue a certificate, degree, or industry-recognized credential in an area designated as high need. Grant recipients must maintain Missouri residency and work in Missouri for three years after graduation to prevent the grant from becoming a loan that must be repaid with interest. Among other requirements, students must be 25 years or older or have not been enrolled in any school within the last two years, not have received a bachelor’s degree, and make no more than $80,000 filing jointly or no more than $40,000 filing any other tax status. More information about this grant and the application process can be obtained from the Missouri Department of Higher Education & Workforce Development.

Additional Government Financial Aid Programs

Workforce Innovation and Opportunity Act (WIOA). This program provides funding to meet college expenses. Eligibility is determined on an individual basis and reflects current economic circumstances of the applicant. Students should contact the nearest Missouri Career Center to apply.

Trade Adjustment Act (TAA) - Training Rehabilitation Act (TRA). Assistance is available for unemployed adults who have been laid-off due to factory closings. Full or partial college expenses may be funded if eligibility is determined. Information is available through the nearest Missouri Career Center.

Vocational Rehabilitation Services. The Vocational Resource Educator at State Technical College of Missouri administers vocational rehabilitation (VR) services designed to help citizens with physical or mental disabilities. Vocational rehabilitation services are provided through the Division of Vocational Rehabilitation, part of the Missouri Department of Elementary and Secondary Education. The program is supported by federal and state funds. Call (866) 661-9106 for more information. VR offices are located throughout the state in order to provide convenient service to clients.

NOTE: State and/or Federal funded programs may be subject to change without prior notice.

Internal Tuition Waivers Provided By State Technical College Of Missouri
All grade point averages must be calculated on, or converted to, a 4.000 scale. Students will be given the highest single tuition waiver for which they qualify. All tuition waivers will be divided equally over the fall and spring semesters of eligibility unless otherwise noted. Additional awards may be given on an individual basis at the discretion of the State Technical College of Missouri Scholarship Committee. All tuition waivers are non-transferable. It should also be noted that all internal awards are waivers of tuition. Outside funding available to the student will take precedence over the college tuition waiver. Tuition waivers may not exceed tuition in any semester and may be reduced at the discretion of State Technical College of Missouri. Awards are given to State Technical College of Missouri full-time, degree seeking students only. Unless otherwise noted, priority deadline for tuition waivers is May 1 for fall enrollment and December 1 for spring enrollment. However, applications will be accepted until 30 days prior to the start of the semester and will be based on the availability of funds. The application for tuition waivers is available in the Office of Financial Aid and Office of Admissions.

President’s Waiver. ($2,000 Award) This waiver is awarded to first time entering college freshmen. The student must rank in the top 15 percent of his/her high school class and have a composite score of 28 or higher on the ACT. This tuition waiver is applied at the rate of $1,000 per year for those students who achieve and maintain a cumulative GPA of 3.800.
FFA Waiver.  ($2,000, $1,500, $1,000 Award) This waiver is awarded to first time entering college freshmen. The student must place first, second, or third at the state FFA contest. This waiver is designed to reward students with strong technical skills. It may be applied toward any subject area at State Technical College of Missouri. This tuition waiver is also available to State Technical College of Missouri students meeting the same contest criteria at the postsecondary FFA level. A certificate must be presented to the Office of Financial Aid.

Academic Achievement Award.  ($1,000 Award) This tuition waiver is awarded to first time entering college freshmen. The student must have a composite score of 26 or higher on the ACT. This tuition waiver is applied at the rate of $500 per year provided a 3.000 grade point average is maintained.

AVTS Continuing Education Award.  ($1,000 Award) This tuition waiver is awarded to first time entering college freshmen. The student must be an area vocational technical school graduate who maintained at least a “B” average for two years. This tuition waiver will be applied at the rate of $500 per year provided a “B” average is maintained.

MITEA (Missouri Industrial Technology Education Association) Waiver.  ($2,000, $1,500, $1,000 Award) This tuition waiver is awarded to first time entering college freshmen. The student must place first, second or third at the state MITEA contest. This waiver is designed to reward students who have demonstrated exceptional technical ability. It may be applied toward any subject area at State Technical College of Missouri. A certificate must be presented to the Office of Financial Aid.

Armed Service Award.  ($500 Award) This tuition waiver is awarded to first time entering college freshmen. The student must be a member of good standing in the National Guard Reserves, or person who has separated from active duty within 6 months prior to admission to the college. The student must submit a tuition waiver application and a letter of endorsement from the appropriate commanding officer. This tuition waiver is nonrenewable.

Phi-Beta Lambda (PBL) Waiver.  ($2,000, $1,000 Award) This tuition waiver is awarded to a high school graduate who placed first or second at the state Future Business Leaders of America (FBLA) contest or awarded to a first time entering college freshman who places first or second at the state PBL contest. A certificate must be presented to the Office of Financial Aid.

Ford AAA Waiver.  ($2,000, 1,500, $1,000 Award) State Technical College of Missouri is proud to recognize and reward the winners of the Ford AAA National Quality Care Challenge. Individuals who have placed first, second or third at the State Competition and are enrolling in State Technical College of Missouri’s Automotive Technology program will receive a tuition waiver for the amount of $1,000 (3rd place), $1,500 (2nd place) or $2,000 (1st place). A certificate must be presented to the Office of Financial Aid.

National Hot Rod/State Technical College of Missouri Waiver.  ($1,000) This tuition waiver is awarded to first time entering college freshmen. The student must place first in the National Hot Rod Association spec class (designed for high school students). Waivers will be awarded to each of the winners from the three NHRA sanctioned tracks in Missouri. The waiver will be prorated by the number of semesters with the full-time degree program in which the student is enrolled at State Technical College of Missouri and will be provided in the form of a tuition waiver. A certificate must be presented to the Office of Financial Aid.

Legacy Tuition Waiver.  Students who are not Missouri residents may be eligible for the Legacy Tuition Waiver if their parent is a State Technical College of Missouri graduate. This waiver is designed to waive the out-of-state tuition, so the student pays the current in-state tuition rate. To remain eligible for this waiver, students must maintain a cumulative 3.000 GPA. To be considered, students must apply at the Office of Financial Aid.

Non-Resident Tuition Waiver.  (Maximum $650 per Semester) Nuclear Technology students who are not Missouri residents may be eligible to receive a non-resident tuition waiver by submitting a written request for non-resident tuition waiver to the Office of Financial Aid no later than 30 days prior to start of student’s first semester.
International Student Tuition Waiver.  **(Maximum is $650 per Semester)** International students may apply for an international student tuition waiver, provided: 1) all procedures for International Student Admission have been completed, 2) a written request for international tuition waiver has been submitted to the Office of Financial Aid no later than 30 days prior to start of student’s first semester, and 3) a letter of recommendation has been submitted to the Office of Financial Aid no later than 30 days prior to semester start.

Senior Citizens’ Tuition Waiver.  Awarded to any Missouri resident who is at least sixty-five years of age on or before August 1 of the school year.  The student must satisfy all entrance requirements of the college and provide documentation of age to the Office of Financial Aid.  The college will determine eligibility based on available class space after tuition-paying students have enrolled.  A person receiving this waiver shall take all tuition-free courses on a noncredit basis and shall satisfy all course prerequisites of the institution per RSMo 173.091.  All applicable fees apply.

Missouri Association for Career and Technical Education (Missouri ACTE) Conference.  **(one-$1,000 and two - $250 Awards)** This waiver is awarded to first time entering college freshmen.  See the High School Counselor for availability.

Helping Hand Award (Alumni).  **($300 Award)** This award provides an opportunity for a State Technical College of Missouri alumnus to extend a “helping hand” to another deserving person whom they encourage to attend State Tech.  Assistance in the form of a $300 tuition waiver is awarded in the name of the nominating alumnus.  This waiver is available only to first time entering freshmen.  This tuition waiver will be applied at the rate of $300 for the fall semester only.  Applications should be submitted early as awards will be made on a first received basis.  Application is available at [https://www.statetechmo.edu/wp-content/uploads/2016/03/HelpingHand.pdf](https://www.statetechmo.edu/wp-content/uploads/2016/03/HelpingHand.pdf).

State Technical College Of Missouri Scholarships
The application for scholarships is available in the Office of Financial Aid and Office of Admissions.

Boys State Scholarship.  **($1,200 Award)** The applicant must be a Missouri Boys State Citizen and rank in the top 30% of his high school class.  The recipient will receive a work grant valued at $1,200 per year, renewable if a 3.000 GPA is maintained and a minimum of 12 credit hours per semester is completed at State Technical College of Missouri.  A certificate must be presented to the Office of Financial Aid.

Girls State Scholarship.  **($1,200 Award)** The applicant must be a Missouri Girls State Citizen and rank in the top 30% of her high school class.  The recipient will receive a work grant valued at $1,200 per year, renewable if a 3.000 GPA is maintained and a minimum of 12 credit hours per semester is completed at State Technical College of Missouri.  A certificate must be presented to the Office of Financial Aid.

National SkillsUSA/Postsecondary Agriculture Student (PAS) Travel Scholarship.  Any State Technical College of Missouri student eligible to compete at the National SkillsUSA competition or the National PAS competition while enrolled at State Technical College of Missouri will receive an award to cover the travel expenses of attending the competition.  Travel expenses shall include transportation to and from the event and hotel accommodations while attending the event.

Out-of-State Scholarship.  This award is available to first-time incoming students.  Full-time, degree seeking students who meet State Technical College of Missouri’s automatic admissions requirements will be eligible for the Out-of-State Scholarship award.  This scholarship awards in-state tuition for up to five consecutive semesters to any eligible students without Missouri resident status (award renewal requires 3.000 GPA).  Students are eligible for either an institutional out-of-state scholarship or a non-resident tuition waiver, they cannot be combined.  Outside funding available to the student will take precedence over any institutional scholarships and tuition waivers.  Nuclear Technology majors are not eligible for the institutional out-of-state scholarship, however, Nuclear Technology majors are eligible for a $650 non-resident tuition waiver and may apply for the Nuclear Regulatory Commission (NRC) scholarships.  In fiscal years that the NRC scholarship is not available, Nuclear Technology majors may apply for the out-of-state scholarship.
**Resident Assistants.** Resident Assistants in Housing are eligible for a fee reduction equal to the cost of double room rent. See the Resident Manager for a job description and application.

**SkillsUSA Missouri Scholarship.** ($2,000 (1st place), $1,500 (2nd place), $1,000 (3rd place) Award) Students demonstrating strong technical skills by placing first, second, or third in a SkillsUSA Missouri contest are eligible for a State Technical College of Missouri Scholarship - $2,000 1st place, $1,500 2nd place, $1,000 3rd place. Recipients must be first-time entering college freshmen who enroll at State Technical College of Missouri. The scholarship must be used during the first year of enrollment. Students receiving multiple SkillsUSA Missouri contest placements will receive the single highest award earned. Excess funds will not be refunded or transferred to a different academic year. Outside tuition funding available to the student will take precedence over the scholarship award. All awards are non-transferable. Awards are given to full-time, degree seeking students only. Awards will be applied in the following order: tuition, fees, and costs of required books, tools, and supplies purchased at the college’s Bookstore. The award cannot be used for meal plan, housing, or any other college related expenses. Official scholarship certificate must be presented to the Office of Financial Aid upon enrollment.

**SkillsUSA Missouri State Officer Scholarship.** ($1,000 Award) Any member of the State Officer Team of SkillsUSA Missouri that enrolls at State Technical College of Missouri for the academic year following the year in which the officer position was held will receive a one-time scholarship in the amount of $1,000. Awards are given to full-time, degree seeking students only. Excess funds will not be refunded or transferred to a different academic year. Outside tuition funding available to the student will take precedence over the scholarship award. All awards are non-transferable. Awards will be applied in the following order: tuition, fees, and costs of required books, tools, and supplies purchased at the college’s Bookstore. The award cannot be used for meal plan, housing, or any other college related expenses. Provide documentation of your position to the SkillsUSA State Officer Team to the Office of Financial Aid upon enrollment.

**Student Government Association (SGA) Scholarship.** ($400 - $600 Award) Scholarships are given for leadership roles in student government. Students are nominated by a Student Government Association (SGA) advisor.

**Corporate, Endowed, And Privately Sponsored Scholarships**
The following scholarships, listed by academic program, are managed by the Foundation for State Technical College of Missouri and the Office of Financial Aid. These scholarships are available to full-time students enrolling at State Technical College of Missouri. For more information call (573) 897-5135. Review complete scholarship guidelines at [www.statetechmo.edu/scholarship-guidelines/](http://www.statetechmo.edu/scholarship-guidelines/). The scholarship deadline is March 15 unless otherwise noted. Applications may be submitted online at [https://www.statetechmo.edu/scholarship-application/](https://www.statetechmo.edu/scholarship-application/).

Available scholarships include:

**All Programs**
- Adam Carwile Memorial - $500
- Benner Green Learning for Success - $10,000 (over two years)
- Central Electric Power Cooperative - $1,000
- Daniel Mittenburg Memorial - $500
- Herbert Weeks - $300
- Martin Kirby Memorial - $500
- Schierloh Family – Up to $10,000 (over two years)

**Automotive Collision Technology**
- Missouri River Auto Parts (NAPA) - $500

**Automotive Technology**
- Missouri River Auto Parts (NAPA) - $500

**Aviation Maintenance**
- Bill H. Tonsing Memorial - $1,500
- Missouri River Auto Parts (NAPA) - $500

^Multiple awards available.
Civil Engineering Technology
Construction Specifications Institute - $500^  
McConnell and Associates - $500^  
Missouri River Auto Parts (NAPA) - $500^  
National Association of Women in Construction #341 - $500  
Widel, Inc. – up to $1,000 (over two years)

Commercial Turf & Grounds Management
Missouri River Auto Parts (NAPA) - $500^  
National Association of Women in Construction #341 - $500

Drafting and Design Engineering Technology
Construction Specifications Institute - $500^  
National Association of Women in Construction #341 - $500

Electric Power Generation Technology
Andrew Ell Memorial - $500  
Missouri River Auto Parts (NAPA) - $500^  
National Association of Women in Construction #341 - $500

Electrical Distribution Systems
John M. Thomas Memorial - $1,000  
Missouri River Auto Parts (NAPA) - $500^  
National Association of Women in Construction #341 - $500

Electronics Engineering Technology
Electronics Engineering Instructors - $500  
Missouri River Auto Parts (NAPA) - $500^  

Electronics Engineering Technology - Biomedical Engineering Technology Option
Dean Crist Memorial - $500^  

Heating, Ventilation, & Air Conditioning Technology
Bill Matthews Memorial - $500  
Daniel Boone RSES Scholarship - $1,000  
Construction Specifications Institute - $500^  
Missouri River Auto Parts (NAPA) - $500^  
National Association of Women in Construction #341 - $500

Heavy Equipment Operations
McConnell and Associates - $500^  
Missouri Land Improvement Contractors Association - $1,000  
Missouri River Auto Parts (NAPA) - $500^  
National Association of Women in Construction #341 - $500  
Widel, Inc. – up to $1,000 (over two years)

Heavy Equipment Technology
Construction Equipment Distribution Association (CEDA) Bill Mitchell Memorial Scholarship - $500^  
Fabick CAT - $1,000^  
Foley Equipment - $1,000^  
Missouri River Auto Parts (NAPA) - $500^  
National Association of Women in Construction #341 - $500

^Multiple awards available.
Heavy Equipment Technology - CAT Dealer Service Technician Option
Fabick CAT - $1,000^  
Foley Equipment - $1,000^  
Missouri River Auto Parts (NAPA) - $500^  

Industrial Electricity
Electricity Club of State Technical College of Missouri - $300  
Missouri River Auto Parts (NAPA) - $500^  
National Association of Women in Construction #341 - $500  

Medical Radiologic Technology
Jesus & Rosa Radiologic Technologist - $500  

Medium/Heavy Truck Technology
Fabick CAT - $1,000^  
Foley Equipment - $1,000^  
Missouri River Auto Parts (NAPA) - $500^  

Nuclear Technology
Ameren Callaway Plant - $1,000^  
Exelon Nuclear - $1,000^  
NextEra Energy - $2,500^  
Nuclear Regulatory Commission – up to $10,000^ (over two years)  
Nuclear Suppliers Association - $500^  

Physical Therapist Assistant
Holt Family - $2,000^  

Powersports Technology
Freedom Cycles - $3,500 (over two years)  
Missouri River Auto Parts (NAPA) - $500^  

Practical Nursing Technology
Carol Schneider - $1,000^  
Guinevere Braun Gevecker Memorial Scholarship - $1,500  
Holt Family - $2,000^  

Precision Machining Technology
Bruce Runge Memorial - $500  
Missouri River Auto Parts (NAPA) - $500^  
Steelville Manufacturing - $4,000^ (over two years)  
Terry Rakes Memorial - $1,000  

^Multiple awards available.

Externally Managed Scholarships
Externally managed scholarships specific to State Technical College of Missouri students are available. For more information about these scholarships visit https://www.statetechmo.edu/external-scholarships/.  

Many organizations offer college scholarships and tuition reimbursement programs. Check information sources such as your high school counselor, the public library, employers, and clubs/associations of which you are a member.
ACADEMIC/INSTITUTIONAL REGULATIONS

Official College Communication With Student
Each student is provided a State Technical College of Missouri e-mail account, which is the college’s primary method of communicating important and time-sensitive information. The student is expected to check the e-mail sent to this account on a frequent and consistent basis, and to respond to official communications from State Technical College of Missouri in a timely manner. The student is responsible for monitoring this account and for the consequences of missing important and time-sensitive messages.

Graduation Requirements
In addition to meeting the Associate of Applied Science degree or certificate requirements, all candidates for graduation are required to:
♦ Earn a cumulative grade point average (GPA) of at least 2.000 overall. Program standards that exceed this requirement will take precedence.
♦ Earn a cumulative GPA of at least 2.000 in the core curriculum and program requirements. Program standards that exceed this requirement will take precedence.
♦ Complete all required assessments and surveys.
♦ Clear all financial obligations to the college.

Graduation Procedures
To be considered for graduation, a student must submit a Graduation Application to the Academic Records Office as follows:
♦ Spring graduates should apply by the preceding October 1st.
♦ Summer graduates should apply by the preceding December 1st.
♦ Fall graduates should apply by the preceding July 1st.

A student who completes degree or certificate requirements, earns the required cumulative GPAs, completes all required assessments, and applies by the above dates will be eligible for graduation. A student who is not eligible to graduate, must reapply for graduation when all requirements are met.

Graduate diplomas and transcripts will not be released until the following are completed:
♦ Clear all financial obligations to the college.
♦ Return any library materials.
♦ Submit a completed Graduate Status Survey to the Career Services Office.
♦ Complete Financial Aid exit counseling if a federal student loan was borrowed while attending State Technical College of Missouri.

Commencement Ceremony Participation
A student who is eligible to graduate or is approved through the petition to participate process, obtains a cap and gown, and wears proper attire with his or her cap and gown during the ceremony, is eligible to participate in commencement ceremonies. A non-refundable commencement fee is assessed to students in the first semester that they are enrolled full-time at State Technical College of Missouri. Visit the college website at https://www.statetechmo.edu/tuition-fees/ for more information.

Student Learning Outcomes
State Technical College of Missouri is committed to improving student learning outcomes and providing opportunities for a successful academic experience for all students. It is the policy of this institution that all degree or certificate seeking students will be required to participate in knowledge and performance evaluations at appropriate points of development in their programs of study.

Designed to ensure continuous improvement, State Technical College of Missouri’s student learning outcomes process includes placement exams, nationally standardized certification and licensure exams, project and performance evaluations, capstone courses, and student needs and satisfaction surveys. State Technical College of Missouri will provide an ongoing evaluation of the student learning outcomes and placement process. Such an evaluation occurs on a regular basis and is monitored by the Student Learning Outcomes Committee.
AJA@™STC Grading System
In addition to the academic grades listed on transcripts, a job readiness work ethic score and an attendance percentage are issued for each class completed as appropriate. This value-added service to students is a result of industry advisory council member input.

AJA@™STC information is recorded on the student transcript as follows:
A: Academic Grades (GRD) = A, B, C, D, F
J: Job Readiness Work Ethic (JR) = score of 0.0 – 4.0
A: Attendance (ATT) = percentage of 1 – 100

Academic Grade (GRD)
The academic grade represents an evaluation of a student’s academic performance in each class and is determined by criteria established by the instructor and communicated to students in the class syllabus. Only academic grades are used in calculating grade point average. The State Technical College of Missouri academic grading system is as follows:

<table>
<thead>
<tr>
<th>Academic Grade</th>
<th>Explanation</th>
<th>Quality Points Per Credit Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Superior</td>
<td>4</td>
</tr>
<tr>
<td>AR</td>
<td>Articulated Credit</td>
<td>N/A</td>
</tr>
<tr>
<td>AU</td>
<td>Audit</td>
<td>N/A</td>
</tr>
<tr>
<td>B</td>
<td>Above Average</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>2</td>
</tr>
<tr>
<td>CR</td>
<td>Credit</td>
<td>N/A</td>
</tr>
<tr>
<td>D</td>
<td>Below Average, Passing</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>Fail</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>N/A</td>
</tr>
<tr>
<td>NR</td>
<td>No Grade Recorded</td>
<td>N/A</td>
</tr>
<tr>
<td>P</td>
<td>Pass</td>
<td>N/A</td>
</tr>
<tr>
<td>TR</td>
<td>Transfer Credit</td>
<td>N/A</td>
</tr>
<tr>
<td>WD</td>
<td>Withdrew</td>
<td>N/A</td>
</tr>
<tr>
<td>WV</td>
<td>Waived</td>
<td>N/A</td>
</tr>
</tbody>
</table>

The following academic grading scale is used for all State Technical College of Missouri letter graded credit classes:

<table>
<thead>
<tr>
<th>Grading Scale</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>90 to 100%</td>
<td>80 to 89.9%</td>
<td>70 to 79.9%</td>
<td>60 to 69.9%</td>
<td>59.9% and below</td>
</tr>
</tbody>
</table>

Higher grading percentages than the above grading scale take precedence with approval by the Vice President of Academic Affairs if the need is supported by program accreditation or certification requirements.

Job Readiness Work Ethic Score (JR)
The Job Readiness Work Ethic Score is calculated based on areas related primarily to attitude and work ethic as defined in the Job Readiness Work Ethic Chart. The Job Readiness Work Ethic Chart can be accessed through EagleLMS or on the State Technical College of Missouri website, www.statetechno.edu. The final job readiness work ethic score is a number between 0.0 and 4.0, with 4.0 being the best job readiness work ethic score. The final job readiness work ethic score may be either an average score or the ending score as determined by each instructor.
Attendance Percentage (ATT)
Attendance is calculated as a percentage of class days attended according to the following point system:

- Present (P) = 2 points
- Absent (A) = 0 points
- Late (L) = 1 point
- Excused (E) = 2 points

Excused Absences – For the list of excused absences, visit https://eagleonline.statetechmo.edu/ics/AJA@STC and click on “Attendance Percentage.”

Computing Grade Point Average
A student’s academic standing is evaluated by using the grade point average. Quality points are assigned to letter grades using the following 4.000 system:

- A - Four quality points per credit hour attempted
- B - Three quality points per credit hour attempted
- C - Two quality points per credit hour attempted
- D - One quality point per credit hour attempted
- F - Zero quality points per credit hour attempted

The student’s grade point average (GPA) is obtained by dividing the total quality points by the credits attempted. The grade symbols of P, WD, I, AR, AU, CR, NR, TR and WV are not included in calculations of grade point average.

All GPA’s are calculated to three decimal places. GPA’s are not rounded. Determination of academic honors, academic standards, academic probation and suspension are based on the truncated GPA.

Grade Reports
Grade reports are available on EagleOnline at https://eagleonline.statetechmo.edu/ics on the Student Information tab.

Incomplete Grades
An instructor or student may initiate discussion regarding whether an “I” (incomplete) grade is appropriate in a given situation. An “I” (incomplete) grade can be recorded for a student who has completed at least 60 percent of required class work with a passing grade, but because of reasons acceptable to the instructor, has failed to complete all of the class work. The completed Request for Incomplete Grade form should be submitted to the Academic Records Office by the instructor issuing the incomplete grade.

It is the student’s responsibility to complete the class work in order to receive a final grade and get the “I” grade removed from his or her transcript no later than six weeks after the last day of class. Six weeks after the last day of class, it is the instructor’s responsibility to assign a final grade for the student based on class work completed prior to that date.

Grade Change Request
A student has until six weeks after the end of the semester during which a class is completed to petition for the final academic grade, job readiness work ethic score, or attendance percentage to be changed. To appeal a final class academic grade, job readiness work ethic score, or attendance percentage, the student should complete a Final Grade Review Request form that is available on EagleOnline at https://eagleonline.statetechmo.edu/ics on the Student Information tab or from the Office of Counseling Services or the Vice President of Student Affairs.

Class Re-Take Procedure
Any student who receives a grade of “F” or lower than a program’s required minimum grade in a required class will need to retake the class. When a student retakes a class, both grades remain on the student’s transcript. The higher grade obtained is used in calculating the cumulative GPA. The retake grade is entered on the transcript at the end of the semester in which the class was completed. Third party sponsors typically do not pay for class re-takes.
Transfer Credit
A student who has earned a grade of “D” or better from another accredited institution of higher education in a course that is comparable to a course offered at State Technical College of Missouri may be granted transfer credit based on an evaluation of the transcript, course content, and grade required. The college will treat grades on transferred classes on the same basis as grades for classes completed at State Technical College of Missouri. Transfer credit approval should be sought through the Registrar.

In the event of transfer credit, it is the student’s responsibility to make sure he/she does not enroll in State Technical College of Missouri classes that duplicate the transfer credit under review. If the student is enrolled in a class that might transfer and the deadline has passed to add/drop classes, he/she is responsible for the cost of that class regardless of any credit that is transferred. Before adding or dropping classes, the student should research if the schedule change will affect full-time enrollment status and financial aid eligibility.

A student requesting transfer credit from an institution of higher education outside the United States must have the transcript evaluated by an approved agency. Contact the Registrar for a list of approved international transcript evaluation agencies.

Accepted transfer credits are not included in the student’s State Technical College of Missouri grade point average calculation.

Missouri Reverse Transfer
Reverse transfer is the process of allowing college students or former college students who have completed credits for an associate degree to receive that degree even if they have transferred to a different college or university, or dropped out of higher education altogether. Missouri has moved forward with a statewide policy to help more Missourians earn a degree. Visit https://dhewd.mo.gov/ReverseTransfer.php for statewide policy information. The college’s Missouri Reverse Transfer contact is the Registrar at registrar@statetechmo.edu.

Residency Requirement For An Associate of Applied Science Degree
To graduate from State Technical College of Missouri with an A.A.S. degree, a student is required to have earned a minimum of 32 credit hours in technical education from State Technical College of Missouri. The 32 credit hours in technical education must meet the requirements of the degree being sought. All but 12 credit hours of the 32 credit hours in technical education may include approved articulated credit and/or credit for prior learning.

Exception: To graduate with an A.A.S. degree in Nursing a student is required to have earned a minimum of 23 credit hours in technical education from State Technical College of Missouri. The 23 credit hours in technical education must meet the requirements of the A.A.S. degree in Nursing. All but 12 credit hours of the 23 credit hours in technical education may include approved articulated credit and/or credit for prior learning.

Residency Requirement For A Certificate

Certificates - Two-Year, One-Year, and Less than One-Year. To graduate from State Technical College of Missouri with a Two-Year, One-Year, or Less than One-Year Certificate, a student is required to earn two-thirds of the total certificate technical education credits from State Technical College of Missouri. The certificate credits earned at State Technical College of Missouri:

1. Must meet the requirements of the certificate being sought.
2. May include approved articulated credit with State Technical College of Missouri not to exceed one-third of the total technical education credits in the certificate being sought.

Certificate - One Semester. To graduate from State Technical College of Missouri with a One Semester Certificate, a student is required to earn 100% of the total certificate technical education credits from State Technical College of Missouri. The certificate credits earned at State Technical College of Missouri:

1. Must meet the requirements of the certificate being sought.
2. May include approved articulated credit with State Technical College of Missouri not to exceed one-third of the total technical education credits in the certificate being sought.
Articulation Of Secondary/Technical Courses
Various area secondary/technical schools and comprehensive high schools within the state have entered into articulation agreements with State Technical College of Missouri. The primary goal of articulation is to expand educational opportunities for students with a seamless transition from secondary to higher education technical programs at State Technical College of Missouri. Students who want to apply articulated high school credit must be seeking an associate of applied science degree or certificate. Articulation credit must be used within the first year after high school graduation with the exception of statewide articulation agreements. In the event of articulation credit, it is the student’s responsibility to make sure he/she does not enroll in State Technical College of Missouri classes that duplicate the articulated credit under review. If the student is enrolled in a class that might articulate and the cutoff date has passed to add/drop classes, he/she is responsible for the cost of that class, regardless of any credit that is articulated. Before adding or dropping classes, it is the student’s responsibility to research if the schedule change will affect full-time enrollment status and financial aid eligibility.

Accepted articulation credits are not calculated into the student’s grade point average.

Advanced Placement Credit
High school students may be eligible to receive academic credit for high school Advanced Placement (AP) courses that they have successfully completed. Students who score a 3 or higher on a 5-point scale for an AP course examination will earn credit for having completed the comparable State Tech course requirement. AP credit is available in the following State Tech subject areas: communication, economics, mathematics, science, and social science. Please visit the State Tech website at https://www.statetechmo.edu/advanced-placement-credit/ for a chart listing specific courses that are eligible for AP credit.

Visit the College Board’s website at https://apscore.collegeboard.org/scores to learn how to send your scores to State Tech.

Dual Credit

Offered Through State Technical College Of Missouri
Dual credit allows qualified high school students to earn high school and college credit simultaneously for taking designated college-level classes. Dual credit classes may be offered at area high schools, career centers, distance education, or on a State Technical College of Missouri campus.

State Technical College of Missouri dual credit classes are taught by high school instructors who meet the required qualifications under State Technical College of Missouri supervision.

In order to be eligible for dual credit courses, including career and technical education (CTE) courses, all prospective dual credit students must meet the same requirements for placement into individual courses, (e.g., English or mathematics) as those required of on-campus students.

Students who meet the following requirements will be considered for dual credit:

- Students in the 11th and 12th grades must meet the grade point average (GPA) criteria listed below:
  1. Students in the 11th and 12th grades with an overall minimum grade point average of 3.000 (on a 4.000 scale) are automatically eligible for dual credit courses.
  2. Students in the 11th and 12th grades with an overall grade point average between 2.500-2.999 (on a 4.000 scale) must provide a signed letter of recommendation from their principal or guidance counselor and provide written permission from a parent or legal guardian.

- Students in the 9th and 10th grade must meet the grade point average (GPA) criteria listed below:
  1. Students in the 10th grade must have an overall minimum grade point average of 3.000 (on a 4.000 scale) and must provide a signed letter of recommendation from their principal and guidance counselor and provide written permission from a parent or legal guardian.
  2. Students in the 9th grade must have an overall minimum grade point average of 3.000 (on a 4.000 scale), score at the 90th percentile or above on the ACT or SAT, and provide a signed letter of recommendation from their principal and guidance counselor and provide written permission from a parent or legal guardian.

- Satisfactory completion of any course requisites
Complete and submit an online State Technical College of Missouri Dual Credit/Dual Enrollment Program Application for Admission
Submit a current high school transcript
Complete and submit the Dual Credit/Dual Enrollment Class Registration and Academic and Financial Information Release Form
School official and parent/legal guardian permission
Payment of all tuition and fees

College credit for dual credit classes will be awarded at the end of the semester in which the class is completed.

Offered Through Other Two/Four Year Colleges
State Technical College of Missouri will grant appropriate college credit to a student who has taken comparable classes through other higher education institutions’ dual credit program while enrolled in high school. For a student to receive State Technical College of Missouri credit, the Office of Admissions must receive an official college transcript from the college or university granting the credit. Required course equivalency will be evaluated on a class-by-class basis. For more information, please refer to the section on Transfer Credit.

Dual Enrollment
Dual enrollment allows qualified high school students to earn college credit for taking designated college-level classes that may or may not count toward high school credit. Dual enrollment classes may be offered at area high schools, career centers, distance education, or on a State Technical College of Missouri campus.

State Technical College of Missouri dual enrollment classes are taught by State Technical College of Missouri instructors.

In order to be eligible for dual enrollment courses, including career and technical education (CTE) courses, all prospective dual enrollment students must meet the same requirements for placement into individual courses, (e.g., English or mathematics) as those required of on-campus students.

Students who meet the following requirements will be considered for dual enrollment:

- Students in the 11th and 12th grades must meet the grade point average (GPA) criteria listed below:
  1. Students in the 11th and 12th grades with an overall minimum grade point average of 3.000 (on a 4.000 scale) are automatically eligible for dual enrollment courses.
  2. Students in the 11th and 12th grades with an overall grade point average between 2.500-2.999 (on a 4.000 scale) must provide a signed letter of recommendation from their principal or guidance counselor and provide written permission from a parent or legal guardian.

- Students in the 9th and 10th grade must meet the grade point average (GPA) criteria listed below:
  1. Students in the 10th grade must have an overall minimum grade point average of 3.000 (on a 4.000 scale) and must provide a signed letter of recommendation from their principal and guidance counselor and provide written permission from a parent or legal guardian.
  2. Students in the 9th grade must have an overall minimum grade point average of 3.000 (on a 4.000 scale), score at the 90th percentile or above on the ACT or SAT, and provide a signed letter of recommendation from their principal and guidance counselor and provide written permission from a parent or legal guardian.

- Satisfactory completion of any course requisites
- Complete and submit an online State Technical College of Missouri Dual Credit/Dual Enrollment Program Application for Admission
- Submit a current high school transcript
- Complete and submit the Dual Credit/Dual Enrollment Class Registration and Academic and Financial Information Release Form
- School official and parent/legal guardian permission
- Payment of all tuition and fees

College credit for dual enrollment classes will be awarded at the end of the semester in which the class is completed.
Credit For Prior Learning
Credit for Prior Learning is a way for students to obtain credit for their knowledge, skills, and previous experience at no cost to the student. There are several ways for students to receive credit for prior learning at State Technical College of Missouri:

Credit By Examination/Test Out
This is an opportunity for students to receive college credit for college-level knowledge and skills obtained outside of college through faculty designed, course-specific examinations/test outs and if appropriate hands-on-demonstration of knowledge and skills. Contact the State Technical College of Missouri’s Testing Center for more information at testingcenter@statetechmo.edu.

Industry Credentials/Licenses
Students who possess a current valid license or industry credential that is equivalent to a course or courses offered at State Technical College of Missouri may be awarded credit for that course or courses. Contact the Registrar for more information at registrar@statetechmo.edu.

Military Courses
The college awards educational credits for a course that is part of the students’ military educational experiences or service that meets the standards of the American Council on Education or equivalent standards for awarding academic credit and that is determined to be equivalent to a course offered at State Technical College of Missouri. Students requesting military credit must provide a transcript from the Community College of the Air Force (CCAF), the Army/American Council on Education Registry Transcript System (AARTS), the Sailor/Marine American Council on Education Registry Transcript (SMART), or the Joint Services Transcript (JST). Military credit approval should be sought through the Registrar at registrar@statetechmo.edu.

Credit/Class Load
The unit of credit is the semester hour. Normally, one credit may be earned in a lecture course which meets for one hour each week during a semester. In a laboratory course, one credit usually is granted for two to three hours in a lab each week during the semester.

A student desiring to take more than 18 credit hours or less than 12 credit hours per semester must meet with his/her advisor for approval. A student desiring to take less than a full class load of 12 credit hours per semester also needs to consult the Office of Financial Aid about financial aid eligibility.

Late Enrollment And Additional Classes
A student is permitted to enroll in or add a 16-week class through the first five class days of the semester. Eight-week classes may be added through the first two class days of the eight-week term. Classes meeting on alternative schedules have pro-rated deadlines. However, classes added after the first day of the semester may not be eligible for financial aid funding. Please see the Office of Financial Aid for an eligibility determination before adding a class after the first day of the semester.

Independent Study
In certain instances, independent study may be used to complete the requirements for regularly offered classes. If a student wishes to take a class on an independent study basis, he/she must get approval through the department chair of his/her major program. The class curriculum must follow the already established syllabus. A student has one semester to complete class requirements.

Special Topics Class
A special topics class may include instruction on topics not covered in other classes. Topics covered in other classes may also be covered in more depth in a special topics class. The special topics curriculum must be developed and pursued under the direction of a faculty member with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics class, provided that the credits earned in this manner do not exceed a total of four (4) credits.
Auditing A Class
If a student wishes to attend a class without receiving credit for the class, the student may register on an audit basis. A student who audits a class is expected to complete all class requirements, pay the regular tuition and fee rate, and meet the class prerequisites or receive special permission from the instructor. A student receiving financial aid or veterans benefits cannot count audited classes to establish full or part-time status. Audit status must be established in writing prior to the beginning of the class. A student may not change his/her status from auditing to receiving a grade or vice versa once the class has started.

Class Attendance
A student is expected to attend all of the classes in which he/she is enrolled. Excessive absences are determined by attendance requirements detailed in each class syllabus.

The college validates enrollment at the beginning of each semester. Students must attend the first day of each class or have made prior arrangements with their instructor to secure their seat in the class. Students whose instructors report first-day absences may have those classes dropped from their schedules. Financial aid recipients who do not attend classes may be required to repay some or all of the financial aid credited to their State Technical College of Missouri account for the semester.

If the student is absent excessively, he/she must either withdraw from the class or accept the final academic grade, job readiness work ethic score, and attendance percentage earned. Failure to officially withdraw from a class(es) may result in an “F” academic grade. The student shall remain financially responsible for the class. All class refunds will be calculated in accordance with the refund policy. (See the section on Refunds.)

Make-Up Work
Only instructors may determine what is or is not allowed for make-up work. It is the responsibility of the student to immediately request to make-up work missed because of class absence.

Inclement Weather
The college will hold classes beginning at the usual time unless announced otherwise in the public media or on the website at www.statetechmo.edu. Inclement weather notification will also be sent via text message and e-mail through the State Tech Alert System. The announcement will specify State Technical College of Missouri. When it is determined and announced that class starting time should be delayed due to inclement weather, classes will meet on the “Late/Delayed Start”. If the college is on “Late/Delayed Start”, classes will begin at 10:10 a.m. Those that meet prior to 10:10 a.m. will be cancelled. Report to your 10:10 a.m. class or the class that would normally be in session at 10:10 a.m. This will allow students and staff the opportunity to travel to classes after the roads have been cleared and the campus prepared. The college does not want to endanger anyone’s safety. In all cases, use your own judgment regarding hazardous driving conditions. The college will attempt to make a decision and notify the media prior to 6:00 a.m. Off-campus locations have their own inclement weather procedures.

Academic Standards
A 2.00 or better cumulative grade point average (GPA) is required for graduation. A cumulative GPA of 2.000 is also required in the core curriculum and program requirements. Program standards that exceed these requirements will take precedence.

Academic Honors
A full-time student (enrolled in 12 or more credit hours) who earns a semester grade point average (GPA) of 3.500 or higher will be placed on that semester’s Dean’s List. A student whose semester grade point average is 3.000 to 3.499 will be placed on that semester’s Honor Roll. A student with high academic grades may be considered for membership in the Phi Theta Kappa, Alpha Phi Omicron Chapter at State Technical College of Missouri, a national scholastic honor society.
**Academic Probation**
A student receiving an overall semester GPA of below 2.000 will be placed on academic probation for one semester. Program standards that exceed this requirement will take precedence. This is a warning to the student that his/her grades in the next semester must improve to above 2.000 overall semester GPA to avoid academic suspension. Academic probation does not prohibit a student from enrolling in the next semester’s classes. A student that is put on academic probation is required to meet with a college counselor to complete a Student Success Plan.

**Academic Suspension**
A student with an overall semester GPA below 2.000 for two (2) consecutive semesters will be suspended from State Technical College of Missouri. A student suspended from the college as a result of low grades shall not return to State Technical College of Missouri for the next semester during which the student is enrolled or expected to be enrolled. Program standards that exceed this requirement will take precedence. A student returning from academic suspension must reapply to the college to begin taking classes again. A student returning from suspension will be on academic probation during that first semester back. If, at the end of that semester, a student earns less than a 2.000 semester GPA, he/she will again be suspended for another semester.

**Standard Of Student Conduct**
A student enrolling at the college assumes the obligation to conduct himself/herself in a manner compatible with the policies of the college and is expected to comply with federal, state, and county laws concerning activities prohibited generally and specifically on college property and at college-sponsored functions. If a student fails to do so and engages in behavior disruptive to the educational process, the college will institute appropriate disciplinary action. Refer to the current student handbook that is located at [https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook](https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook). This handbook is also available in the Vice President of Student Affairs’ Office.

**Student Handbook**
The handbook describes in detail student services guidelines and procedures, college regulations, student conduct policies, and the student discipline process. It is the responsibility of every student to read this document and follow the guidelines and procedures detailed within the handbook. Each student is given written notice that the Student Handbook is located at [https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook](https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook) and are encouraged to print a copy of the handbook from the website for their own use. The handbook is also available in the Vice President of Student Affairs’ Office.

**Academic Integrity**
The academic integrity of the college will not permit acts of academic dishonesty to take place without consequences. Refer to the Student Handbook for definitions of academic dishonesty. The primary persons who are empowered to monitor, detect, report, and recommend sanctions for academic dishonesty are instructors. Initial consequences for academic dishonesty are instructor-driven.

In addition to instructors’ sanctions, academic dishonesty can lead to dean’s sanctions of disciplinary probation or disciplinary suspension. When instructors and deans recommend a presidential review, the student also risks expulsion from the college.

Incidents of academic dishonesty are to be reported to the Vice President of Student Affairs. This includes anything that a student might do to circumvent the academic requirements of the college.

**Student Drug Screening**
State Technical College of Missouri drug screens students in Industrial Electricity, Aviation Maintenance, any program requiring a commercial driver’s license, and programs that require clinical work. The specifics of the testing procedures and implementation of this policy will be determined by the President of the College. Such policies shall provide for due process required by law and may provide greater procedural protections.

**Substance Abuse**
State Technical College of Missouri strives to maintain a working and learning environment that is free from the effects of alcohol and illegal drugs. For more information see the Student Handbook at [https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook](https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook).
Tobacco Free Campus
Smoking and use of smokeless tobacco, E-Cigarettes, and other smoking devices are not permitted on college property effective July 1, 2020.

Weapons Policy
The possession or storage of a deadly weapon, destructive device, or fireworks in any form is prohibited on any campus property or in any facility, including that which is owned, leased, or operated/controlled by the college. This includes college housing, Activity Center, college vehicles, or at any off-campus facility owned, leased, or operated by the college. Any student or employee found to be in violation of this policy is subject to disciplinary action.

Presidential Order On Firearms
Until further notice, consent to carry concealed firearms into or onto property owned or controlled (including the airport) by State Technical College of Missouri other than in a vehicle as provided by law may only be done so with the written consent of the college President.

Archery Equipment Policy
Bows and arrows are allowed on campus solely for use at the archery range located in the Activity Center. Bows and arrows are not allowed in any other building on campus except as provided for in this policy or as specifically authorized by the college President for purposes of archery events or tournaments held on the college’s campus. Students living in campus housing units may store their bows in their rooms; however, arrows shall be stored in a separate location provided by the college. Other individuals bringing archery equipment on campus for use at the archery range are expected to either keep their bows and arrows securely locked in their vehicles when not in use or equipment may be checked and stored at the range. Visitors to campus found to be in violation of this policy may be prohibited from future use of the archery range.

Sexual Harassment
State Technical College of Missouri is committed to providing an inclusive and welcoming educational and working environment for everyone – an environment where sex discrimination, including sexual harassment, sexual assault, stalking, and intimate partner violence, is not tolerated. The definition of sexual harassment as found in 34 CFR § 106.30:

Sexual harassment includes any of three types of misconduct on the basis of sex: (1) any instance of quid pro quo harassment by a recipient’s employee; (2) any unwelcome conduct that a reasonable person would find so severe, pervasive, and objectively offensive that it denies a person equal educational access; and (3) any instance of sexual assault (as defined in the Clery Act), dating violence, domestic violence, or stalking as defined in the Violence Against Women Act (VAWA).

State Technical College of Missouri’s Commitment to Addressing Sexual Misconduct (TITLE IX)
State Technical College of Missouri does not tolerate sex or gender discrimination including sexual misconduct such as sexual harassment and sexual assault, stalking, and dating or domestic violence. These behaviors are harmful to the well-being of our community members, the learning/working environment, and positive relationships among our students, faculty, and staff. All forms of prohibited conduct under the college’s policy regarding sex discrimination and sexual misconduct are regarded as serious allegations.

Title IX of the Education Amendments of 1972 prohibits discrimination on the basis of sex or gender in the college’s programs and activities. The college will investigate reports of sexual misconduct. Persons who have been accused of violating Title IX and the sexual misconduct policy are presumed innocent until proven guilty and will receive due process under the college policy.

The college has an obligation to make reasonable efforts to investigate and address complaints or reports of sex or
gender discrimination, including sexual misconduct, whenever it has actual knowledge of a report of behavior that allegedly violates college policy.

Filing a Complaint
Any member of the college community may file a complaint against a student based on a violation of State Technical College of Missouri’s Student Code of Conduct. Complaints may be directed to the Title IX Coordinator in Nilges Technology Center Room 109, (573) 897-5201, or by email at title9coordinator@statetechmo.edu.

Campus Crime Prevention and Awareness
The Clery Act requires colleges and universities that receive federal funding to disseminate a public annual security report (ASR) to employees and students every October 1st. This ASR must include statistics of campus crime for the preceding three calendar years plus details about efforts taken to improve campus safety. ASRs must also include policy statements regarding, but not limited to, crime reporting, campus facility security and access, law enforcement authority, incidence of alcohol and drug use, and the prevention of and response to sexual assault, domestic or dating violence, and stalking.

The Campus SaVE Act refers to the Violence Against Women Act (VAWA) amendments to the Clery Act. The Campus SaVE Act is an update to the Clery Act that expands the scope of this legislation in terms of reporting, response, and prevention education requirements around rape, acquaintance rape, domestic violence, dating violence, sexual assault, and stalking.

To view the most recent Annual Security and Fire Safety Report, please click on Annual Security and Fire Safety Report.

Questions about this report can be directed to the Campus Security Survey Administrator, located in the Vehicle and Power Center, Room 213 or at (573) 897-5228.

Dispute Resolution Process
State Technical College of Missouri personnel shall maintain records of formal written student complaints, which will be filed with the Vice President of Student Affairs. These records will include information about the disposition of the complaints, including those referred to external agencies for final resolution. Information concerning the procedures for maintaining these records is available from the Vice President of Student Affairs. See the Student Handbook at https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook for more information related to the dispute resolution process.

Withdrawing From A Class
A student may withdraw from a class during the first three quarters of the class. Withdrawal during this time will be recorded on the transcript as “WD”. After three quarters of any class, withdrawals and “WD” grades are not allowed, and letter grades are assigned by instructors.

NOTE: There may be costs associated with withdrawing from any or all classes. See the sections on “Student Financial Aid Information” and “Refunds” or discuss this with the Financial Services Coordinator and Financial Aid staff who are located in the Information Technology Center.

A completed Add/Drop form must be submitted to the Academic Records Office to officially withdraw from a class. This form is available online and at the Academic Records Office.

Failure to attend class does not constitute withdrawal from that class. Students remain financially responsible for classes from which he/she does not officially withdraw.

Withdrawing From The College
To officially withdraw from State Technical College of Missouri, a student must complete a Withdrawal Form and submit the completed form to the Academic Records Office or Office of Financial Aid to have the form processed. The date of withdrawal will be the last date of attendance at a documented academic-related activity. Upon any consideration of withdrawal, the student is strongly encouraged to speak with the Financial Aid staff. Failure to
complete a Withdrawal Form and officially withdraw from classes may result in the student receiving an “F” grade for each class in which he/she is enrolled. The student will be held responsible for the full cost of each class in which he/she is enrolled. Failure to attend classes does not constitute a withdrawal from the college.

**Transcript Request**


Unofficial transcripts are available on EagleOnline at [https://eagleonline.statetechmo.edu/ics](https://eagleonline.statetechmo.edu/ics) on the Student Information tab under My Grades.

**Academic Records**

State Technical College of Missouri adheres to the guidelines set forth in the Family Educational Rights and Privacy Act (FERPA) of 1974, Buckley Amendment and maintains policy in accordance with this act. A detailed statement pertaining to (1) records maintained, (2) access procedures, (3) directory information and (4) content challenge is published in the State Technical College of Missouri Student Handbook. Additional information can be obtained from the Registrar at (573) 897-5145 or see the Student Handbook at [https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook](https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook).

**STUDENT LIFE, ACTIVITIES, AND SERVICES**

Services for students at State Technical College of Missouri are designed to provide support services to students in meeting their individual educational goals. Services to students at State Technical College of Missouri include financial aid, on-campus housing, academic advisement, library resources, academic support, counseling services, services for special populations, career planning, student activities and organizations.

**Counseling Services**

The Office of Counseling Services works together with all faculty members in carrying out the counseling program at State Technical College of Missouri. Academic, social, and career concerns will be primarily coordinated in the Office of Counseling Services. These concerns include but are not limited to attendance, insubordination, behavioral issues, health, safety and welfare. The counselors do not attempt to make decisions for students; rather, they seek to help students make responsible decisions for themselves. Counseling services at State Technical College of Missouri assist students in making educational and personal decisions. Should additional counseling services be required, students will be referred to qualified counselors off-campus.

**Services For Special Populations**

State Technical College of Missouri does not discriminate on the basis of race, color, national origin, sex, age or disability in admission/access to or treatment/employment in its programs and activities. All inquiries concerning compliance with such regulations should contact the Vice President of Student Affairs by phone at (573) 897-5000. State Technical College of Missouri is committed to providing equal opportunities for students of special populations in accordance with Section 504 of the Rehabilitation Act of 1973 and with the Americans with Disabilities Act (ADA) of 1990.

State Technical College of Missouri provides support for students who have documented permanent disabilities by making reasonable accommodations. If you have a disability that needs accommodations, contact your assigned counselor.

**Library**

The Library is located on the main level of the Information Technology Center. It is a state-of-the-art comprehensive academic library and serves as the informational and educational hub of the college. The Library supports the mission of the college through its collection, services, specialized research, and study areas.

The Library collection is maintained to support instructional programs of the college and to support lifelong learning of students, employees, and community patrons. The Library provides print materials, audio-visual materials, and a multitude of online databases. Students will find resources that cover highly technical and specialized topics as well
as fiction, nonfiction, and popular movies. The Library also provides Internet access in the public access area. The Library facility is designed to create an ideal environment for study and research with designated spaces for individual and group study. Library instruction classes are provided to enhance the search and retrieval of library resources.

State Technical College of Missouri is a charter member of MOBIUS, a multistate consortium that provides access to resources of 66 academic, seven public, and three special libraries, and the Missouri State Library serving a total of 213 physical branches in Missouri, Oklahoma, Texas, Iowa, and Arkansas. The MOBIUS (https://searchmobius.org) union catalog, shared lending with Colorado and Wyoming’s Prospector system, Article Reach, and OCLC Interlibrary Loan services extend access and delivery beyond the walls of the State Technical College of Missouri campus, thus allowing our students access to nearly unlimited resources.

A professional librarian is available in the library and can be reached by e-mail at librarian@statetechmo.edu or by telephone at (573) 897-5215 for reference and research assistance. Additional information can be found at https://www.statetechmo.edu/library/ and the online access catalog at https://avalon.searchmobius.org.

**Academic Resource Center**

The mission of the Academic Resource Center (ARC) is to provide academic support and resources that enhance instructional programs. The ARC is located in the Library on the main level of the Information Technology Center. Tutoring services are provided by both staff and peer tutors. Peer tutors are required to have at least a 3.00 GPA, recommendations from instructors, and a recent transcript showing competency in the subject(s) to be tutored. The ARC staff and peer tutors provide individual and group tutoring for State Technical College of Missouri general education classes, which include the following: mathematics, written and oral communications, environmental science, physics, anatomy and physiology, American history and government, Introduction to Microcomputers, and Job Search Strategies. Students may come to the ARC for assistance with any State Technical College of Missouri mathematics, science, or writing assignment, including library assignments and resume preparation. The ARC also offers study skills seminars for State Technical College of Missouri students. These seminars support the study skills necessary to succeed in college. Seminar topics may include note-taking, test-taking, and time management.

The ARC includes group study areas and computers equipped with current Microsoft software. Accommodations for students with Individualized Education Plans are supported by ARC staff members.

ARC employees can be reached by e-mail at StaffARC@statetechmo.edu or by telephone at (573) 897-5204.

**Student Computer And Internet Acceptable Use Procedure**

This procedure provides for general ethical behavior and acceptable use of State Technical College of Missouri computers and Internet access. All students are required to sign the "Acceptable Use Procedure" before access is granted to computers and the Internet. Furthermore, students may expect further use guidelines when using the library, academic resource center, and/or departmental laboratories.


**On-Campus Housing Facilities**

The State Technical College of Missouri housing community has a maximum occupancy of 144 residents. Students are housed in nine cottages, which have eight rooms each. The rooms are available as double occupancy or single occupancy units. Single rooms are available at a premium cost, based upon availability. Residents are required to purchase a meal plan. Prices for rooms and meal plans can be obtained from the Resident Manager at (573) 897-5165. For additional information please refer to https://www.statetechmo.edu/housing/.

All students are expected to provide their local address to the college and will have the responsibility of informing the college of any change that is made in housing.

**Career Services**

The ability of State Technical College of Missouri graduates to enter and hold related employment is one of the most important indicators of the college’s success. State Technical College of Missouri’s lifelong career services assistance program was developed to assist graduates in obtaining employment in related occupations. For details
regarding these services, see the Career Services webpage at https://www.statetechmo.edu/career-services/. The Career Services staff and college faculty have developed and maintained relationships with many of Missouri’s businesses, industries, and governmental agencies. Employer contacts are also available across the country.

**Student Activities/Organizations**
The Student Government Association officers and student club sponsors, with the assistance of the Activity Center Associate Director, maintain an effective program of student activities. The college offers a number of activities that take place outside the regular classroom and for which credit is not given. Each student is urged to participate in extracurricular activities. Student activities may include basketball, softball, volleyball, dodgeball, kickball, bowling, comedians, cultural programs, and special events. Suggestions for new activities are always welcome. Student organizations currently in existence are Student Government Association (SGA), Phi Theta Kappa (PTK), SkillsUSA, Horticulture/National Postsecondary Agricultural Student Organization (PAS) Club, Aviation Club, Home Builders Association Student Chapter, Computer Club, Resident Government Association (RGA), Associated General Contractors (AGC), Physical Therapist Assistant Club, Machine Tool Club, Veteran Students Club, Phi Beta Lambda, Iota Epsilon Chapter of Lambda Nu, and Learning, Service, and Respect (LSR) Club. Each student organization is required to have a constitution, which states the aims and purposes of the group and how it contributes to campus life and student development. Each organization is responsible for choosing its own officers and for scheduling its activities with the Activity Center Associate Director. Any interested person or group of people who wish to create an organization can form clubs on campus with approval from the Activity Center Associate Director. All student clubs must have a State Technical College of Missouri–affiliated sponsor in order to utilize student activity fees and use State Technical College of Missouri in their names. Contact the Student Life Coordinator for details.

**Main Campus Traffic**
The speed limit on main campus is 15 mph. If speed limits are abused, driving privileges on campus may be revoked and a fine may be issued. For more information see the Student Handbook at https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook.

**Main Campus Parking**
Student parking is restricted to all white striped lots on the main campus and does not require a parking pass. Students living in student housing will receive a parking permit allowing students to park in student housing lots only. Students living in student housing cannot park in any lots other than those in student housing. Any vehicle parked in unauthorized areas will be subject to a minimum $25.00 fine. Double fines may be assessed for failure to heed warnings. Repeat offenders may be subject to the towing of the vehicle at the owner’s expense. For more information see the Student Handbook at https://wiki.statetechmo.edu/stc/index.php/Category:Student_Handbook.

Special arrangements for handicapped and temporary parking can be made with the Receptionist in the Information Technology Center.

Visitors may park in any yellow striped lot and require a parking pass. Visitor parking passes are available from the Receptionist in the Information Technology Center. Visitor lots can be found south of the Information Technology Center and north of the Vehicle and Power Center near the Automotive Technology building.
STATE OF MISSOURI

DEGREE AND CERTIFICATE REQUIREMENTS

State Technical College of Missouri offers the following degree and certificates:

- Associate of Applied Science Degree
- Certificate – Two-Year
- Certificate – One-Year
- Certificate – Less than One-Year
- Certificate – One Semester

ASSOCIATE OF APPLIED SCIENCE DEGREE
The associate of applied science degree is awarded to a student who completes a general education core and a comprehensive series of technical courses designed to prepare the student for employment in a specific career. The associate of applied science degree may also be recognized for transfer by four year colleges and universities.

State Technical College of Missouri offers an Associate of Applied Science degree in the following areas:

Automation & Robotics Technology
Automotive Collision Technology
Automotive Technology
  General Option
  Electric/Hybrid Vehicle Option
  High Performance Option
  Light-Duty Diesel Option
Aviation Maintenance
Business Administration
  General Option
  Accounting Option
  Technical Specialty Option
Civil Engineering Technology
Commercial Turf & Grounds Management
Computer Application Development
Drafting and Design Engineering Technology
Electric Power Generation Technology
Electrical Distribution Systems
Electronics Engineering Technology
  General Option
  Biomedical Engineering Technology Option
General Technology
Heating, Ventilation, & Air Conditioning Technology
Heavy Equipment Technology
  General Option
  CAT Dealer Service Technician Option
Industrial Electricity
Automated Controls Technician Option
Construction Option
Medical Radiologic Technology
Medium/Heavy Truck Technology
Networking Systems Technology
Nuclear Technology
Instrumentation and Control Option
Radiation Protection Option
Reactor Operations Option
Nursing
Physical Therapist Assistant
Powersports Technology
  General Option
Agriculture & Turf Equipment Option
Precision Machining Technology
Utility Systems Technician
Welding Technology
CERTIFICATES
A certificate is awarded to students who complete a series of courses designed to develop a job skill or competency.

State Technical College of Missouri offers Certificates in the following areas:

Automotive Collision Technology
    Refinishing & Non-Structural Repair – One-Year
    Structural & Mechanical Repair – One-Year

Automotive Technology
    General Automotive – One-Year
    Maintenance & Light Repair – One-Year

Aviation Maintenance
    Powerplant – One-Year
    Airframe – One-Year

Business Administration – One-Year

Commercial Turf & Grounds Management
    Turfgrass Management – One-Year
    Landscape Management – One-Year

Dental Assisting Technology – One-Year

Electrical Power Generation Technology – One Semester

Electronics Engineering Technology

Biomedical Equipment Technology – One Semester

Heavy Equipment Operations – One-Year

Industrial Electricity

Electromechanical – One-Year

Networking Systems Technology – One-Year

Advanced – One-Year

Practical Nursing Technology – Two-Year

Welding Technology

Entry-Level Welding – Less than One-Year

Advanced-Level Welding – One-Year

COURSE PREFIXES
The following is a list of the course prefixes and definitions included in this catalog.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC</td>
<td>Accounting</td>
</tr>
<tr>
<td>ACT</td>
<td>Automotive Collision Technology</td>
</tr>
<tr>
<td>AGR</td>
<td>Agriculture</td>
</tr>
<tr>
<td>AMT</td>
<td>Automotive Technology</td>
</tr>
<tr>
<td>ASC</td>
<td>Associated Science Course</td>
</tr>
<tr>
<td>BUS</td>
<td>Business Administration</td>
</tr>
<tr>
<td>CAT</td>
<td>CAT Dealer Service Technician (HET Option)</td>
</tr>
<tr>
<td>COM</td>
<td>Communication</td>
</tr>
<tr>
<td>CPP</td>
<td>Computer Application Development</td>
</tr>
<tr>
<td>CTG</td>
<td>Commercial Turf &amp; Grounds Management</td>
</tr>
<tr>
<td>CVT</td>
<td>Civil Engineering Technology</td>
</tr>
<tr>
<td>DAT</td>
<td>Dental Assisting Technology</td>
</tr>
<tr>
<td>DDT</td>
<td>Drafting and Design Engineering Technology</td>
</tr>
<tr>
<td>EDS</td>
<td>Electrical Distribution Systems</td>
</tr>
<tr>
<td>EET</td>
<td>Electronics Engineering Technology</td>
</tr>
<tr>
<td>EMS</td>
<td>Engineering/Mathematics/Science</td>
</tr>
<tr>
<td>EPG</td>
<td>Electric Power Generation Technology</td>
</tr>
<tr>
<td>GNT</td>
<td>General Technology</td>
</tr>
<tr>
<td>HEO</td>
<td>Heavy Equipment Operations</td>
</tr>
<tr>
<td>HET</td>
<td>Heavy Equipment Technology</td>
</tr>
<tr>
<td>HST</td>
<td>History</td>
</tr>
<tr>
<td>IEL</td>
<td>Heating, Ventilation, &amp; Air Conditioning Technology</td>
</tr>
<tr>
<td>MAR</td>
<td>Automation &amp; Robotics Technology</td>
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<tr>
<td>MAT</td>
<td>Mathematics</td>
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<tr>
<td>MHT</td>
<td>Medium/Heavy Truck Technology</td>
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<tr>
<td>MNT</td>
<td>Nuclear Technology</td>
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<tr>
<td>MRT</td>
<td>Medical Radiologic Technology</td>
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<tr>
<td>NUR</td>
<td>Nursing</td>
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<tr>
<td>PHY</td>
<td>Physics</td>
</tr>
<tr>
<td>PMT</td>
<td>Precision Machining Technology</td>
</tr>
<tr>
<td>PNT</td>
<td>Practical Nursing Technology</td>
</tr>
<tr>
<td>PSC</td>
<td>American Government</td>
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<tr>
<td>PST</td>
<td>Powersports Technology</td>
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<tr>
<td>PSY</td>
<td>Psychology</td>
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<tr>
<td>PTA</td>
<td>Physical Therapist Assistant</td>
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<tr>
<td>SEM</td>
<td>Seminar</td>
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<tr>
<td>SPM</td>
<td>Self-paced Mathematics</td>
</tr>
<tr>
<td>TAM</td>
<td>Aviation Maintenance</td>
</tr>
<tr>
<td>UST</td>
<td>Utility Systems Technician</td>
</tr>
<tr>
<td>WLT</td>
<td>Welding Technology</td>
</tr>
</tbody>
</table>
COURSE REQUISITES
Some courses at State Technical College of Missouri have prerequisite, corequisite, and/or concurrent requisite requirements. Requisite requirements are included in the course description for each course to which they apply. Enrollment in a course with a requisite requirement is not permitted until the requisite requirement is satisfied. The various types of course requisites are defined below:

- **Prerequisite.** A course or requirement that must be completed prior to enrollment in a given course.
- **Corequisite.** A course or requirement that must be completed prior to or at the same time as enrollment in a given course.
- **Concurrent requisite.** A course or requirement that must be completed at the same time as enrollment in a given course.

CATALOG YEAR
The semester that students enter college is stored in the State Tech student information system database. This permanent record is referred to as the student's catalog year and provides the degree or certificate graduation requirements that a student will follow to reach his/her goal. The student who does not remain continuously enrolled has two calendar years to complete all graduation requirements and apply for graduation. After two calendar years, the student must reapply for admission under the catalog requirements in effect at that time. Students who change majors at State Tech are subject to the degree or certificate graduation requirements in effect on the date that the change of major becomes effective.

In order to meet accrediting standards or to upgrade course offerings, the degree requirements specified by the catalog the student is enrolled under may be modified under certain conditions.

GENERAL EDUCATION REQUIREMENTS

**Philosophy Of General Education**
The college aims to prepare students to perform effectively in highly specialized and advanced technical occupations and respond effectively to the inevitable technical and societal changes that will occur throughout their careers. To respond to change, students will need to engage in a lifelong process of inquiry, decision-making, and acquisition of new knowledge. General education, which has as its fundamental purpose the development and integration of every student’s knowledge, skills, attitudes and experiences, is one of the best means for achieving the ability to engage effectively in critical thinking and problem solving needed in the work place and beyond.

The associate of applied science degree is composed of the following areas of study: communications, mathematics, sciences, and technical literacy. A certificate is composed of general education appropriate to the area of study.

A key characteristic of the curriculum for each program is the integration of academic and technical education into a balanced program of study designed to develop broad-based, highly-skilled technicians. This requires that the student develop a foundation of communication, mathematics, science, and social knowledge and skills, as well as developing appropriate attitudes associated with successful technicians. This foundation is provided by completion of the required general education courses. The knowledge and skills developed are then integrated into technical education courses for purposes of reinforcement and for purposes of connecting the material learned to specific applications in the student’s field of study.

**Core Curriculum Transfer (CORE 42)**
Senate Bill 997 established the Higher Education Core Transfer Curriculum Act (Sections 178.785-789 RSMo), which directs the Coordinating Board for Higher Education to develop a standard core transfer curriculum and a common course numbering equivalency matrix for lower-division general education courses. The core transfer curriculum, known as CORE 42, is a framework for general education that all Missouri public two-and four-year institutions of higher education will adopt effective for the 2018-2019 academic year. The goal of the CORE 42 is to facilitate the seamless transfer of academic credits. The completion of the CORE 42 at any public institution of higher education will transfer to every other public institution of higher educational level.
education in the state and substitute for the receiving institution’s general education requirement. Individual courses that comprise the CORE 42 are guaranteed to transfer one-to-one among all public colleges and universities. Courses without the CORE 42 identifier may also transfer. For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/ State Technical College of Missouri accepts CORE 42 courses as transfer credit when coursework is required for a students’ degree or certificate program. Students who are denied CORE 42 transfer credit may appeal the decision using the process located at https://www.statetechmo.edu/core-curriculum-transfer-core-42/.

The Associate Of Applied Science General Education Core

Students seeking an Associate of Applied Science Degree are required to take a general education core including a minimum of 19 semester credit hours selected from the courses listed below. See each program’s General Education Requirements for specific courses.

### ASSOCIATE OF APPLIED SCIENCE GENERAL EDUCATION CORE REQUIREMENTS

<table>
<thead>
<tr>
<th>Course #</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td><strong>Area 1. Oral &amp; Written Communication - 6 Credit hours</strong></td>
<td></td>
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<tr>
<td></td>
<td>COM 101 English Composition - MOTR ENGL 100</td>
<td>3</td>
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<td></td>
<td>Or</td>
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<tr>
<td></td>
<td>COM 110 Honors Composition*</td>
<td>3</td>
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<td></td>
<td>And</td>
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<tr>
<td></td>
<td>COM 111 Oral Communications - MOTR COMM 100 or MOTR COMM 120</td>
<td>3</td>
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<td></td>
<td>Or</td>
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<tr>
<td></td>
<td>COM 121 Public Speaking - MOTR COMM 110</td>
<td>3</td>
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<tr>
<td></td>
<td><strong>Area 2. Mathematics - 3 Credit Hours</strong></td>
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<tr>
<td></td>
<td>MAT 115 College Algebra - MOTR MATH 130</td>
<td>3</td>
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<tr>
<td></td>
<td>MAT 118 Survey of College Mathematics - MOTR MATH 120</td>
<td>3</td>
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<tr>
<td></td>
<td>MAT 119 Elementary Statistics - MOTR MATH 110</td>
<td>3</td>
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<tr>
<td></td>
<td>MAT 120 Pre-Calculus - MOTR MATH 150</td>
<td>5</td>
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<td>Or</td>
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<tr>
<td></td>
<td>MAT 122 Elements of Calculus</td>
<td>3</td>
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<td>Or</td>
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<tr>
<td></td>
<td>MAT 123 Calculus I</td>
<td>5</td>
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<tr>
<td></td>
<td><strong>Area 3. Science - 4 Credit Hours</strong></td>
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<tr>
<td></td>
<td>PHY 100 Physical Science with a laboratory - MOTR PHYS 110L</td>
<td>4</td>
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<td></td>
<td>Or</td>
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<tr>
<td></td>
<td>PHY 101/102 College Physics with a laboratory - MOTR PHYS 150L</td>
<td>4</td>
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<td>Or</td>
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<tr>
<td></td>
<td>PHY 103/104 Environmental Science with a laboratory - MOTR PHYS 110LEV</td>
<td>4</td>
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<tr>
<td></td>
<td>Or</td>
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<tr>
<td></td>
<td>PHY 201 General Physics with a laboratory - MOTR PHYS 200L</td>
<td>5</td>
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<td></td>
<td>Or</td>
<td></td>
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<tr>
<td></td>
<td>ASC 104 Human Anatomy and Physiology with Lab I</td>
<td>4</td>
</tr>
</tbody>
</table>
**ASC 106** Human Anatomy and Physiology with Lab II  
Or  
A science course with a laboratory*  

<table>
<thead>
<tr>
<th>Area 4. Social Science - 3 Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSC 101 American Government(^1,2) - MOTR POSC 101 3</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>HST 105 American History to 1877(^1,2) - MOTR HIST 101 3</td>
</tr>
<tr>
<td>Or</td>
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<tr>
<td>HST 110 American History from 1877 to the Present(^1,2) - MOTR HIST 102 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area 5. Technical Literacy - 3 Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CPP 101 Introduction to Microcomputer Usage 3</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>CPP 102 Advanced Microcomputer Usage 3</td>
</tr>
<tr>
<td>Or</td>
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<tr>
<td>NST 101 Network Fundamentals 3</td>
</tr>
</tbody>
</table>

* Requires Department Approval

\(^1\) PSC 101 American Government, HST 105 American History to 1877, and HST 110 American History from 1877 to the Present fulfill both the general education requirement and Missouri’s constitution requirement.

\(^2\) Transfer students must also meet Missouri’s constitution requirement through an approved method.

The Certificate General Education Core

Students seeking a certificate will follow the specific general education core requirements below for the certificate being sought.

**CERTIFICATE GENERAL EDUCATION CORE REQUIREMENTS**

Certificate – Two-Year

Students are required to take a general education core including at least eight semester credit hours.

Certificate – One-Year

Students are required to complete a basic general education core of at least six semester credit hours.

Certificate – Less than One-Year

Certificates of Less than One-Year may or may not include a requirement for students to complete a basic general education core of at least six semester credit hours.

Certificate – One Semester

Certificates of One Semester may or may not include a requirement for students to complete a basic general education core of at least six semester credit hours.

See each program’s General Education Requirements for specific courses.

**General Education And Related Courses**

The courses listed below are categorized as follows: Agriculture, Communication, Engineering/Mathematics/Science, Mathematics, Science, Seminar, Social Science, and Technical Literacy. Course numbers less than 100 are considered developmental.

**Agriculture**

**AGR 100 Introduction to Agribusiness Systems.** This course is an introduction to agribusiness systems. An overview of the agribusiness industry is provided. Economic and financial principles, retail salesmanship, and record keeping methods are covered. 3 credit hours.
Communication

COM 125  Job Search Strategies. This course is designed to help a student plan and organize a job search, compose job search documents, and demonstrate job-ready behaviors. Topics include resumes, cover letters, references, job applications, interviews, and follow-up letters. 1 credit hour.

COM 030  Introductory English as a Second Language.  Basic English language for daily life in an American college; industry-related vocabulary, reading comprehension and pronunciation; giving directions and checking comprehension of instructions; present, past and future tenses, and modal verbs. 3 credit hours.

COM 035  Intermediate English as a Second Language.  Communicating detailed stories of the past or plans for the future; perfect and continuous tenses; colloquial expressions and phrasal verbs. 2 credit hours.

COM 050  Reading Fundamentals. This course is for students to develop their basic reading skills for college and work. Emphasis will be placed on the fundamentals of reading comprehension, strengthening vocabulary, and the development of higher order thinking skills. Prerequisite: Appropriate reading placement score. 3 credit hours.

COM 070  College Reading Preparation. This course is for students to acquire and improve those reading skills necessary for college-level course work. Emphasis will be placed on reading strategically and flexibly, expanding vocabulary, and demonstrating critical thinking skills. Prerequisite: Appropriate reading placement score, or COM 050 with a grade of “C” or better. 3 credit hours.

COM 095  Basic Writing. This course is for students who need to improve basic writing skills. Emphasis will be placed on improving student skills in basic grammar and focusing on the foundation of composition. Students will progress from sentences to basic paragraph writing assignments. Students must achieve a “C” or better to advance to COM 097. Prerequisite: Appropriate writing placement score. 3 credit hours.

COM 097  Intermediate Writing. This course is for students who need to develop skills necessary for college-level writing. Emphasis will be placed on adapting texts to affect an audience and accomplish a purpose, developing essays, and introducing beginning concepts of research and documentation. Students will progress from paragraph to basic essay writing assignments. Students must achieve a “C” or better to advance to COM 101. Prerequisite: Appropriate writing placement score, or COM 095 with a grade of “C” or better. 3 credit hours.

**COM 101  English Composition. This course is for students to progress their college-level writing skills by practicing the writing process, including prewriting, writing, revising, and editing. Emphasis will be placed on distinguishing between fact and opinion, supporting opinions with facts, and organizing ideas in a logical manner. Students will progress from basic to more complex essays utilizing a variety of rhetorical modes and understanding the basic components of research. Prerequisites: Appropriate writing placement score, or COM 097 with a grade of “C” or better and appropriate reading placement score, or Corequisite: COM 070 with a grade of “C” or better. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR ENGL 100 – Composition I (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

COM 102  English Composition II: Writing the Research Paper. This course is for students to continue developing composition skills. This course stresses writing as a process designed to teach students to find and use library and online resources, to analyze reading materials, to organize and present information accurately, and to cite research sources correctly. Prerequisite: COM 101 with a grade of “C” or better. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR ENGL 200 – Composition II (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).
**COM 110 Honors Composition.** This course is open only to those students who demonstrate above average ability on a department-approved placement test. The course is designed to offer a more challenging and rewarding experience for such students. Emphasis in the course is on development of ideas through the use of rhetorical patterns. Students will read widely and intensively and write a research paper. Prerequisites: Appropriate writing placement score and appropriate reading placement score. 3 credit hours.

**COM 111 Oral Communications.** A study and practice of interpersonal and group communication skills focusing upon the development and improvement of communication. Topics include verbal and nonverbal techniques, listening skills, professional presentations, conflict resolution, and group dynamics. Prerequisite: Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR COMM 100 – Introduction to Communications or MOTR COMM 120 – Interpersonal Communication (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

**COM 121 Public Speaking.** This course is designed to prepare the student to give speeches and oral presentations. Course will include audience analysis, speech content and preparation, and speech delivery. This course may be substituted for COM 111. Prerequisite: Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR COMM 110 – Fundamentals of Public Speaking (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

**COM 130 Fundamentals of Effective Reading.** This course helps students improve their reading skills for specific technical career development. Students will practice strategies for effectively reading a variety of texts related to a technical career. Active and critical reading skills will be included. 2 credit hours.

**COM 134 Effective and Critical Reading.** This course helps students develop their reading skills as a resource for career development and lifelong learning. Methods for effectively reading a variety of challenging materials such as technical manuals and textbooks will be practiced. Active and critical reading skills will be included. 3 credit hours.

**COM 201 Occupational Communication.** The purpose of this course is to teach the student to write a variety of business documents in an effective and appropriate style. In addition, students will prepare and deliver oral presentations relating to the work place. Prerequisite: COM 101 or COM 110 with a grade of “C” or better. 3 credit hours.

**COM 211 Technical Writing.** This course covers the organization and writing of technical documents including proposals, memos, letters, reports, instructions, and electronic communications. Other topics include audience analysis, multiculturalism, graphics, and page design, and ethical and legal considerations. Prerequisite: Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR ENGL 110 – Technical Writing (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

**COM 280 American Literature: 1865 to Present.** This course examines a broad overview of American literature from the end of the Civil War to the present. The historical perspective will be examined as we study different genres and literary movements. Through written assignments, class discussion, and exams, students will gain greater understanding of how American literature both influenced and was influenced by an evolving American culture. Prerequisites: Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR LITR 101B – American Literature (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).
**COM 290**  *Introduction to Theatre.* This course offers an introduction to the theatrical productions and performance. Topics will include acting, directing, and critique of a live performance. The course will also introduce basic terminology, history, script analysis, and technical aspects of theater. Prerequisites: Appropriate writing placement score and appropriate reading placement score. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR THEA 100A – Theatre Appreciation (For additional information visit [https://web.dhewd.mo.gov/coursetransfertracker/](https://web.dhewd.mo.gov/coursetransfertracker)).

**COM 292**  *Introduction to Theatre II.* This course continues the study begun in COM 290 and offers an introduction to the theatrical concerns of acting, voice, and movement. Topics will include listening, improvisation, dramatic reading, monologues, and duet acting. Field trips to attend various theatrical performances will also be included. Prerequisite: COM 290. 3 credit hours.

**COM 299**  *Special Topics in Communications.* Special Topics in Communications (COM) is open to students who have reached advanced standing but wish to continue further study and practice in communications. Projects may be undertaken in any area related to communications or a combination of communications and the student’s major with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.

** This course meets the oral and written communication general education requirement.

**Engineering/Mathematics/Science**

**EMS 104**  *Mathematics for Metalworking.* This course focuses on practical mathematical computations required for various welding technology applications. Areas, volumes, conversions, scaling, and measurement of materials as well as right- and oblique- triangle trigonometry are emphasized. This class will include challenges of solving comprehensive problems relevant to precision custom manufacturing that are similar to what will be encountered in the work environment. 2 credit hours.

**EMS 120**  *Trigonometry for Industrial Electricity.* Topics covered include solution of right and oblique triangle trigonometry; sinusoidal curves; alternating current and phase angles; complex numbers and phasors; and applications to series, parallel and series-parallel AC circuits. Prerequisite: Satisfactory placement score or MAT 051 with a grade of “C” or better or SPM 050 with a passing grade. 3 credit hours.

**EMS 299**  *Special Topics in Engineering/Mathematics/Science.* Special Topics in Engineering/Mathematics/Science (EMS) may include instruction on topics not covered in other EMS courses. Topics covered in other EMS courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.

**Mathematics**

**MAT 031**  *Preparatory Mathematics.* This course includes the following topics of study: operations with decimal and fractional numbers, percents, ratio and proportions, areas and volumes, English and Metric units and measuring devices, introduction to signed numbers, and operations with linear algebra equations. Prerequisite: Satisfactory placement score. 4 credit hours.
MAT 051 Introductory Algebra. This course includes the following topics of study: the real number system, solving linear equations and inequalities, graphing linear functions, systems of linear equations, exponents and polynomials, and an introduction to factoring. Prerequisite: Satisfactory placement score or MAT 031 or HEO 112 with a grade of “C” or better or SPM 030 with a passing grade. 4 credit hours.

MAT 071 Intermediate Algebra. This course includes the following topics of study: factoring polynomials, rational and radical expressions and equations, basic functions and their graphs, and quadratic equations. Prerequisite: Satisfactory placement score or MAT 051 with a grade of “C” or better or SPM 050 with a passing grade. 4 credit hours.

**MAT 115 College Algebra. This college algebra course includes a basic review of exponents, radical expressions, rational exponents, polynomial expressions, factoring, and rational expressions. Students will solve linear, absolute value, quadratic, polynomial, radical, rational, exponential and logarithmic equations; and systems of equations, along with applications. The course covers graphs of circles and functions including linear, quadratic, piecewise, polynomial, rational, exponential and logarithmic. Prerequisite: Satisfactory placement score or MAT 071 with a grade of “C” or better or SPM 070 with a passing grade. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR MATH 130 – Pre-Calculus Algebra or this course MAT 115 College Algebra in combination with MAT 121 Trigonometry meets MOTR MATH 150 – Pre Calculus (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

**MAT 118 Survey of College Mathematics. College mathematics including the following topics: algebra, geometry, trigonometry, counting methods, probability, statistics, and consumer finance. Prerequisite: Satisfactory placement score or MAT 071 with a grade of “C” or better or SPM 070 with a passing grade. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR MATH 120 – Mathematical Reasoning & Modeling (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

**MAT 119 Elementary Statistics. This is an introduction to descriptive and inferential statistics. Topics include the presentation of interpretation of univariate and bivariate data using graphical and numerical methods, probability, discrete and continuous probability distributions, linear regression, an understanding of good practice in study design, statistical inference, confidence intervals, and hypothesis testing. Prerequisite: Satisfactory placement score or MAT 071 with a grade of “C” or better or SPM 070 with a passing grade. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR MATH 110 – Statistical Reasoning (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

**MAT 120 Pre-Calculus. Selected topics in algebra and trigonometry to prepare the student for calculus. Topics covered will include algebraic, exponential, logarithmic, and trigonometric functions, the graphs of these functions, the solution of right triangles, trigonometric identities, and the solution of trigonometric equations. Prerequisite: Satisfactory placement score or MAT 071 with a grade of “C” or better or SPM 070 with a passing grade. 5 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR MATH 150 – Pre-Calculus (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).
MAT 121  Trigonometry. Topics covered include graphing of the trigonometric functions and their use in solution of right and oblique triangles, identities, and solution of trigonometric equations in rectangular and polar coordinates. Corequisite: MAT 071 or SPM 070. 3 credit hours.

This course MAT 121 Trigonometry in combination with MAT 115 College Algebra meets Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR MATH 150 – Pre-Calculus (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

**MAT 122  Elements of Calculus.** An introduction to the concepts and methods of differential and integral calculus. Topics covered will include limits and rates of change, derivatives of polynomial, exponential, logarithmic and trigonometric functions, integrals, and applications. Prerequisites: MAT 120 with a grade of “C” or better or both MAT 115 and MAT 121 with a grade of “C” or better. 3 credit hours.

**MAT 123  Calculus I.** Topics covered include functions, limits and rates of change, derivatives, the mean value theorem and curve sketching, logarithmic and exponential functions, integrals and applications. Prerequisite: MAT 115 or MAT 120 with a grade of “C” or better. 5 credit hours.

SPM 030  Self-paced Preparatory Mathematics. This is an internet based, self-paced tutorial in basic mathematics. Topics studied will include operations with decimal and fractional numbers, percents, ratio and proportions, areas and volumes, English and Metric units and measuring devices, introduction to signed numbers, and operations with linear algebra equations. The SPM series of courses satisfy prerequisite requirements for subsequent courses but are not for credit, and no grade will appear on the transcript. The student must make arrangements in advance with the Math Department to take the MAT 031 final exam on campus. The final exam is taken on a pass/fail basis and 70% or higher is the minimum passing score. Prerequisite: Satisfactory placement score. No credit.

SPM 050  Self-paced Introductory Algebra. This is an internet-based, self-paced tutorial in Introductory Algebra including the study of the real number system, solving linear equations and inequalities, systems of equations, graphing, formula rearrangement, exponents and polynomials, and factoring. The SPM series of courses satisfy prerequisite requirements for subsequent courses but are not for credit, and no grade will appear on the transcript. The student must make arrangements in advance with the Math Department to take the MAT 051 final exam on campus. The final exam is taken on a pass/fail basis and 70% or higher is the minimum passing score. Prerequisite: Satisfactory placement score or MAT 031 with a grade of “C” or better or SPM 030 with a passing grade. No credit.

SPM 070  Self-paced Intermediate Algebra. This is an internet-based, self-paced tutorial in Intermediate Algebra including the review of factoring polynomials, rational expressions, radicals, quadratic equations, and linear systems. The SPM series of courses satisfy prerequisite requirements for subsequent courses but are not for credit, and no grade will appear on the transcript. The student must make arrangements in advance with the Math Department to take the MAT 071 final exam on campus. The final exam is taken on a pass/fail basis and 70% or higher is the minimum passing score. Prerequisite: Satisfactory placement score or MAT 051 with a grade of “C” or better or SPM 050 with a passing grade. No credit.

**  This course meets the mathematics general education requirement.

Science

**ASC 104  Human Anatomy and Physiology w/Lab I.** This course covers orientation to the human body; basic chemistry with respect to human body functions; overview of human cell anatomy and function; body tissues; and the integumentary, skeletal, muscular, and nervous systems. This course explores the relationship between these systems. Prerequisites: College-level writing and reading placement scores. 4 credit hours.
**ASC 106  Human Anatomy and Physiology w/Lab II.** This course builds on topics taught in the first semester and provides a comprehensive look at the regulation and integration of the human body with emphasis on the endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems. This course also explores the relationship between these systems. Prerequisite: ASC 104 with a grade of “C” or better. 4 credit hours.

**ASC 110  Medical Terminology.** This comprehensive introduction to medical terminology is organized by body system and specialty areas of practice. Word building rules assist in understanding the basis for combining word elements and medical terms are broken down into component parts each time a new term is introduced. This course is designed to help the student acquire a working medical vocabulary to spell, use and define medical terms. 1 credit hour.

**PHY 100  Physical Science.** This lecture-demonstration-laboratory survey of the physical sciences is designed for the student with a limited science background. Students should learn about the scientific method and its application with special emphasis on scientific principles encountered in our everyday interactions with our environment. This course is intended for off-campus locations. Prerequisite: MAT 051 with a grade of “C” or better or SPM 050 with a passing grade. 4 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR PHYS 110L – Essentials in Physical Sciences with Lab (For additional information visit [https://web.dhewd.mo.gov/coursetransfertracker/](https://web.dhewd.mo.gov/coursetransfertracker/)).

**PHY 101  College Physics.** This algebra based physics course has topics that may include, but are not limited to, measurement, force, work and energy, matter, fluids, gasses, heat, light, and selected topics in modern physics. Prerequisite: MAT 071 with a grade of “C” or better or SPM 070 with a passing grade. Concurrent: PHY 102. 4 credit hours.

This course PHY 101 College Physics in combination with PHY 102 College Physics Lab meets Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR PHYS 150L – Physics I with Lab (For additional information visit [https://web.dhewd.mo.gov/coursetransfertracker/](https://web.dhewd.mo.gov/coursetransfertracker/)).

**PHY 102  College Physics Lab.** This algebra based physics lab course has topics that may include, but are not limited to, measurement, force, work and energy, matter, fluids, gasses, heat, light, and selected topics in modern physics. Prerequisite: MAT 071 with a grade of “C” or better or SPM 070 with a passing grade. Concurrent: PHY 101. 0 credit hours – all credit given in PHY 101.

This course PHY 102 College Physics Lab in combination with PHY 101 College Physics meets Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR PHYS 150L – Physics I with Lab (For additional information visit [https://web.dhewd.mo.gov/coursetransfertracker/](https://web.dhewd.mo.gov/coursetransfertracker/)).

**PHY 103  Environmental Science.** Environmental science provides an integrated, quantitative, and interdisciplinary approach to the study of environmental systems. Information about physical, chemical, and biological conditions of the environment and their effect on organisms are studied to help solve ecological problems. Sustainable natural resource management will be stressed. An attitude of stewardship of natural capital will be encouraged. Prerequisites: COM 101 or COM 110 and BUS 115 or CPP 101 or CPP 102 or NST 101. Concurrent: PHY 104. 4 credit hours.

This course PHY 103 Environmental Science in combination with PHY 104 Environmental Science Lab meets Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR PHYS 110LEV – Essentials in Physical Sciences with Lab (For additional information visit [https://web.dhewd.mo.gov/coursetransfertracker/](https://web.dhewd.mo.gov/coursetransfertracker/)).
**PHY 104** Environmental Science Lab. This is the science lab corresponding to the Environmental Science lecture course. The courses are designed to increase student awareness of the issues surrounding the interactions of humans with the natural environment. Basic quantitative techniques for collecting and analyzing data from environmental systems will be introduced. Prerequisites: COM 101 or COM 110 and BUS 115 or CPP 101 or CPP 102 or NST 101. Concurrent: PHY 103. 0 credit hours – all credit given in PHY 103.

This course PHY 104 Environmental Science Lab in combination with PHY 103 Environmental Science meets Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR PHYS 110LEV – Essentials in Physical Sciences with Lab (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

**PHY 121** General Chemistry with Lab I. This course is a comprehensive study of general chemistry concepts and emphasizes the fundamental principles of chemistry including measurement, physical and chemical processes, nomenclature, atomic structure, quantum theory, stoichiometry, molecular structure, bonding theory, physical properties of gases, thermochemistry, and properties of solutions. Prerequisite: MAT 071 with a grade of "C" or better. 5 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR CHEM 150L – Chemistry I with Lab (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

** PHY 201** General Physics. This calculus based traditional physics course with lab includes, but is not limited to, selected topics from classical mechanics with other material included as time permits. Prerequisite: MAT 122 or MAT 123 with a grade of “C” or better. 5 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR PHYS 200L – Advanced Physics I with Lab (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

**SCI 151** Microbiology with Lab. This course is a general introduction into the culture and study of microorganisms, their physiology, and structure. Prerequisite: College-level writing and reading placement scores. 4 credit hours.

** This course meets the science general education requirement.

**Seminar**

**SEM 101** Clinical Practice Seminar I. In this course, students refer to their Clinical Rotation Daily Logs to discuss their clinical externship experiences and to ask pertinent questions for instructor input and/or class discussion. Concurrent: DAT 151. No credit.

**SEM 102** Clinical Practice Seminar II. In this course, students refer to their Clinical Rotation Daily Logs to discuss their clinical externship experiences and to ask pertinent questions for instructor input and/or class discussion. Concurrent: DAT 191. No credit.

**SEM 110** Spanish Language and Hispanic Culture. This is a two day seminar offered for students and professionals for the purpose of learning conversational Spanish and Spanish culture. Participants have a desire to better understand and communicate with crew and co-workers of Spanish origin working in their industry. No credit.

**SEM 135** Ford Maintenance & Light Repair (MLR) Service Training Seminar. The MLR service training seminar is an internet based series of courses designed by Ford Motor Company for entry level technicians at Ford Dealerships and for NATEF approved training programs like the college's Automotive Technology Program. The seminar allows students to gain Ford Motor Company recognized certification before entering the job market. Prerequisites: Classroom instruction in the ASE mechanical area and instructor’s permission. No credit.
SEM 145  **Subaru-U Training Seminar.** The Subaru-U training seminar is an internet based series of courses designed by Subaru for entry level technicians at Subaru Dealerships and for NATEF approved training programs like the college's Automotive Technology Program. The seminar allows students to gain Subaru recognized certification before entering the job market. Prerequisites: Classroom instruction in the ASE mechanical area and instructor’s permission. No credit.

Social Science

**HST 105  American History to 1877.** This course surveys political, cultural, economic, and social development of the United States from 15th century European exploration through reconstruction. Course readings, discussions, and tests comply with state requirements regarding the Missouri and federal constitutions. Prerequisite: Appropriate reading placement score, or Corequisite: COM 070 with a grade of “C” or better. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR HIST 101 – American History I (For additional information visit [https://web.dhewd.mo.gov/coursetransfertracker/](https://web.dhewd.mo.gov/coursetransfertracker/)).

**HST 110  American History from 1877 to the Present.** This course surveys political, cultural, economic, and social development of the United States from the end of reconstruction and the settling of the West to present day. Course readings, discussions, and tests comply with state requirements regarding the Missouri and federal constitutions. Prerequisite: Appropriate reading placement score, or Corequisite: COM 070 with a grade of “C” or better. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR HIST 102 – American History II (For additional information visit [https://web.dhewd.mo.gov/coursetransfertracker/](https://web.dhewd.mo.gov/coursetransfertracker/)).

HST 299  **Special Topics in History.** Special Topics in History (HST) is open to students who have reached advanced standing but wish to continue further study on historical topics. Study may be undertaken in any area related to history or a combination of history and the student’s major with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.

PSC 100  **Missouri Government and Constitution.** This course covers the Missouri constitution and state government structure. It is the approved method for students transferring in an American Government or American History course that does not meet the Missouri constitution requirement to meet that requirement. Prerequisite: American Government or American History course completed, passed with a grade of “C” or better, and transferred to State Tech. 1 credit hour.

**PSC 101  American Government.** This course is a survey of American political institutions on the national, state, and local levels. It deals with the basic philosophical foundations of these institutions, their organization, and function. Course readings, discussions, and tests comply with state requirements regarding the Missouri and federal constitutions. Prerequisite: Appropriate reading placement score, or Corequisite: COM 070 with a grade of “C” or better. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR POSC 101 – American Government (For additional information visit [https://web.dhewd.mo.gov/coursetransfertracker/](https://web.dhewd.mo.gov/coursetransfertracker/)).

PSY 161  **Health Psychology.** This course explores the basic principles of human behavior. The student focuses on effective interactions that help the healthcare provider to provide personalized care to the patient and to eliminate negative or ineffective habits. An introduction into death and dying examines the process of dying, the grief process and the dying process as an opportunity for growth. Stress management is addressed and
related to the experiences as a student and neophyte healthcare provider. The mind-body connection is examined, as well as ethical issues related to the healthcare provided. Prerequisites: Appropriate writing placement score and appropriate reading placement score. 3 credit hours.

** This course meets the social science general education requirement.

** Technical Literacy

**CPP 101 Introduction to Microcomputer Usage. An introductory course in the fundamentals of using computer applications. 3 credit hours.

**CPP 102 Advanced Microcomputer Usage. This course emphasizes advanced features of word processing, database, spreadsheet and presentation software as well as a review of the operating system. The focus is on comprehensive projects which include using advanced word processing features; developing database design and management skills; creating spreadsheet models and macros; designing and creating multi-media presentations and creating advanced projects which integrate computer applications. 3 credit hours.

**NST 101 Network Fundamentals. This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of Internet Protocol (IP) addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the Cisco curriculum. 3 credit hours.

** This course meets the technical literacy general education requirement.
MAJOR PROGRAM CURRICULUMS
The Automation & Robotics Technology program offers an engaging Advanced Manufacturing Technician education encompassing all aspects of advanced manufacturing systems. In many industries today, and definitely in the future, electro-mechanical integration is and will be the main component of mass production. Skilled technicians will be needed to create, install, and maintain these automated systems. The Automation & Robotics Technology program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

The program prepares students for multidisciplinary, multi-skilled employment in the manufacturing sector with coursework focused on installing, calibrating, maintaining, troubleshooting, and repairing manufacturing systems. These systems incorporate electricity, electronics, robotics, fluid power, sound safety practices, workplace organization, lean manufacturing principles, problem solving, and maintenance reliability. This program is designed to provide students the opportunity to pursue careers as highly-skilled advanced manufacturing technicians who have the technical knowledge and abilities to perform well, communicate effectively, think critically, work in teams, and behave professionally.

Students that are sponsored by a manufacturing consortium member will receive non-credit work experience through the Advanced Manufacturing Technician consortium. An optional eight-week internship is included in the summer semester between the first and second years that is not provided by the sponsoring manufacturing consortium. The student will perform duties pertaining to their specific program of study.

This program is offered only in St. Charles, Missouri, at the Lewis & Clark Career Center.

A grade of “C” or better must be maintained in all courses in order to continue and graduate in the Automation & Robotics Technology program.

To view program outcome data, visit https://www.statetechmo.edu/programs/industrialtech/amt-mar/amt-marfacts/.

Program Mission
The mission of the Automation & Robotics Technology program provides students with the technical and interpersonal skills and knowledge that qualify them to work as a technician in today's automated manufacturing industries.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Oral and written communication skills.
- Knowledge and skills necessary to set-up and operate manual machine tools.
- An analytic approach to problem solving and troubleshooting.
- Proven professionalism and safety skills required by industry standards.
- Proven technical competency in managing and sustaining automated manufacturing systems.
CORE CURRICULUM

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<td>Work Experience Mentoring and Professional Development I</td>
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<td>MAR 101</td>
<td>Introduction to Electricity</td>
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<td>MAR 102</td>
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<td>MAR 110</td>
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<td>MAR 211</td>
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Optional:
- MAR 190 Internship I (4)

SUB-TOTAL 45-49

GENERAL EDUCATION REQUIREMENTS

General Education Requirements 19
(see page 42-43)
Must Include:
- PHY 101/102 College Physics 4
May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- MAT 118 Survey of College Mathematics 3
- MAT 119 Elementary Statistics 3
- NST 101 Network Fundamentals 3

SUB-TOTAL 19

PROGRAM REQUIREMENTS

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDT 135</td>
<td>Introductory Drafting Fundamentals</td>
</tr>
<tr>
<td>WLT 128</td>
<td>Basic Welding</td>
</tr>
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</table>

SUB-TOTAL 6

GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies 1</td>
</tr>
</tbody>
</table>

SUB-TOTAL 1

It is a graduation requirement of the Automation & Robotics Technology (MAR) program for students to earn a grade of “C” or better in all courses.

PROGRAM TOTAL 71-75
MAR 100 Work Experience Mentoring and Professional Development I. This course teaches workplace safety principles and practices necessary for advanced manufacturing technicians to work safely. 2 credit hours.

MAR 101 Introduction to Electricity. This course introduces and develops the concepts necessary for understanding the use of electrical components and circuitry. Technical math including scientific notation, significant figures, unit conversions, beginning algebra and basic trigonometry will be introduced and developed throughout the course. The first half of the semester is devoted to DC, the second to AC. Prerequisite: Satisfactory placement score into MAT 051 or higher. 4 credit hours.

MAR 102 Work Experience Mentoring and Professional Development II. This course teaches workplace organization and the application of workplace safety principles and practices necessary for advanced manufacturing technicians to work safely. Prerequisite: MAR 100 with a grade of “C” or better. 4 credit hours.

MAR 110 Mechanical and Fluid Power Transmission. This course includes mechanical power transmission topics such as brakes, clutches, gears, couplings, shafts, chains and sprockets, cams and bearings. Hydraulic items include liquid properties, cylinders, motors, pumps, valves and math for proper sizing of components. Pneumatic items include physical principles, cylinders, motors, compressors and control valves. Simulation of circuits will be performed before any laboratory work is done. Laboratory exercises are provided to enhance classroom topics. 3 credit hours.

MAR 118 Industrial Motors and their Controls. This course introduces the students to various types of industrial motors and controls. The student will identify, select, install/wire and troubleshoot three phase and single phase DC/AC motors and controls, including servo and stepper motors. Laboratory exercises include designing and building control modules for machine integration. Prerequisite: MAR 101 with a grade of “C” or better. 4 credit hours.

MAR 125 Applied Electronics. This course introduces and develops the concepts necessary to analyze and test both discrete and integrated circuit components. The first half of the semester is devoted to Analog Circuits, the second to Digital Electronic. Also includes a laboratory course with experiments designed to support this course theory. Prerequisite: MAR 101 with a grade of “C” or better. 4 credit hours.

MAR 150 Machine Shop Fundamentals. This course introduces the student to mechanical blueprint reading, shop safety, bench work and layout, hand tools, measuring instruments and manual machine tools. Technical math including fractions, unit conversions, and basic trigonometry will be introduced and developed throughout the course. Emphasis is placed on the sequence of machining piece parts, tool selection and machine set-up and operation. Prerequisite: Satisfactory placement score into MAT 051 or higher. 4 credit hours.

MAR 190 Internship I. The internship is comprised of 320 hours of work experience in a manufacturing or laser applications setting requiring the student to perform a variety of tasks. The student is expected to apply learned skills to be a productive employee, and the employer is expected to provide an environment that enhances the student’s exposure to the industry. Prerequisite: Department Chair approval. 4 credit hours.

MAR 200 Work Experience Mentoring and Professional Development III. This course teaches lean manufacturing and the application of workplace safety principles and practices necessary for advanced manufacturing technicians to work safely. Prerequisite: MAR 102 with a grade of “C” or better. 2 credit hours.

MAR 201 Work Experience Mentoring and Professional Development IV. This course introduces maintenance fundamentals and relates them to maintenance foundation experiences. Workplace safety principles and practices necessary for advanced manufacturing technicians to work safely are reinforced. Prerequisite: MAR 200 with a grade of “C” or better. 2 credit hours.

MAR 203 Work Experience Mentoring and Professional Development V. This course teaches maintenance reliability and relates it to the core manufacturing. Workplace safety principles and practices necessary for advanced manufacturing technicians to work safely are reinforced. Prerequisite: MAR 201 with a grade of “C” or better. 2 credit hours.
MAR 204  PLC Programming. This course includes a review of number systems, Programmable Logic Control addressing, use of software, system control and an in depth study of ladder logic programming. Programming topics include: discrete and analog inputs and outputs, internal registers and tables, editing, timers, counters, comparison functions, computational functions, data move functions, subroutines, data manipulation and sequencing functions, high speed counting, trigonometric and advanced math functions. Laboratory exercises are provided to enhance classroom topics. Prerequisites: MAR 118 and MAR 125 with a grade of “C” or better. 4 credit hours.

MAR 206  Industrial Robotics. The course is an introduction to state-of-the-art industrial robotics. The course is focused on installation, repair and maintenance of robots and robotic manufacturing systems. Robotic mechanisms and sensors will be reviewed along with interfacing and programming of the controls to perform intermediate manufacturing tasks. Corequisite: MAR 204 with a grade of “C” or better. 4 credit hours.

MAR 211 Theory of Industrial Automation. This course includes a definition of Computer Integrated Manufacturing (CIM) and provides a foundation for its application. Concepts covered include manufacturing product planning, production engineering, production planning, control, and execution. A definition of flexible manufacturing gives the student an insight into the factory of the future. Current employment trends will be discussed. Each student will be prepared to seek employment. This course will be oriented toward choosing, planning for, and conducting the final project on the CIM cell. Project Management software will be taught and utilized. 2 credit hours.

MAR 215  Introduction to Quality Control. This course serves as an introduction to quality for students who are pursuing careers in manufacturing technology or related technical fields. Topics include fundamentals of statistics, control chart variables and attributes, reliability, quality costs, sampling plans, and probability. 3 credit hours.

MAR 218  Computer Interfacing. This course introduces the use of personal computers for data and control in an industrial environment. Applications using common personal computers, "off-the-shelf" components and interfacing boards will be discussed. Also includes a laboratory course with experiments designed to support computer interfacing. Prerequisite: MAR 118 with a grade of “C” or better. 3 credit hours.

MAR 221 Mechanical and Electronic Device Troubleshooting. This course will emphasize the troubleshooting, repair, and maintenance of automation devices such as robots, CNC machining centers, positioning tables, and PLC control systems. Students will be instructed on factory recommended procedures and will be expected to apply proper procedures to different types of industrial equipment. Prerequisites: MAR 118 and MAR 204 with a grade of “C” or better. Corequisite: MAR 206 with a grade of “C” or better. 3 credit hours.

MAR 299  Special Topics in Automation & Robotics Technology. Special Topics in Automation & Robotics Technology (MAR) may include instruction on topics not covered in other MAR courses. Topics covered in other MAR courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. Prerequisite: Department Chair approval. 1-4 credit hours.
AUTOMOTIVE COLLISION TECHNOLOGY

Classification of Instructional Programs - 47.0603

Associate of Applied Science Degree

One-Year Certificates

Refinishing & Non-Structural Repair

Structural & Mechanical Repair

The Automotive Collision Technology program of State Technical College of Missouri prepares students to pursue opportunities in many related careers including auto body repair, automotive painting, and collision damage estimating. The Automotive Collision Technology program is accredited by the National Automotive Technicians Education Foundation (NATEF) and the Association of Technology, Management, and Applied Engineering (ATMAE).

Enrollment in the Automotive Collision Technology program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions for the specific application requirements and deadline.

Students may complete a two-year Associate of Applied Science degree or choose to pursue a one-year technical certificate in the area of Refinishing & Non-Structural Repair. Upon successful completion of the One-Year Certificate in Refinishing & Non-Structural Repair, students may choose to pursue an additional One-Year Certificate in Structural & Mechanical Repair. Students benefit from intensive hands-on experience repairing a variety of damaged vehicles in a well-equipped auto collision repair shop using an extensive inventory of power tools and accessories such as:

- Aluminum Repair Station and Equipment
- Pro Spot Squeeze Type Resistance Spot Welder
- MIG/MAG Welders
- Pulsed Spray Arc Aluminum Welders
- Pulsed Spray Arc Silicon Bronze Welders
- Car-O-Liner Computerized Measuring System
- Chief Velocity Computerized Measuring System
- Chief Impulse E/VHT Frame Rack
- Car-O-Liner Bench Frame Rack
- USI ITALIA Paint Booths
- Solvent Paint Mixing System
- Waterborne Paint Mixing System
- DeVilbiss and Anest Iwata Paint Spraying Equipment

During the Automotive Collision Technology program, students have the opportunity to earn I-CAR Pro-Level 1 & 2 Non-structural Technician, Pro-Level 1 & 2 Refinishing Technician, Pro-Level 1 Structural Technician, and I-CAR MIG Steel Welding certifications.

Courses in electronic safety systems, repair blueprinting, and shop management ensure that graduates can advance and specialize in the field.

Students who graduate with an Associate of Applied Science degree in Automotive Technology may pursue a second Associate of Applied Science degree in Automotive Collision Technology.

It is a graduation requirement of the Automotive Collision Technology (ACT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/transportationtech/act/actfacts/.
Program Mission
The mission of the Automotive Collision Technology program is to prepare students with the higher education, technical and interpersonal skills needed for employment in the challenging and highly technical career of Automotive Collision Technology in line with Automotive Service Excellence (ASE) Master Technician Certification and I-CAR certifications.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Knowledge and skills necessary to repair, replace, and estimate structural and non-structural damages and apply needed processes.
- Electrical knowledge and skills needed to repair and maintain safety devices related to automotive industry.
- Critical thinking skills.
- Oral and written communication skills.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>ACT</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>110</td>
</tr>
<tr>
<td>ACT</td>
<td>115</td>
</tr>
<tr>
<td>ACT</td>
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</tr>
<tr>
<td>ACT</td>
<td>234</td>
</tr>
<tr>
<td>ACT</td>
<td>200</td>
</tr>
</tbody>
</table>

Optional:

- Sheet Metal Fabrication (3)

**SUB-TOTAL** 36-39

GENERAL EDUCATION REQUIREMENTS

General Education Requirements 19
(see page 42-43)

May Not Include:

- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

PROGRAM REQUIREMENTS

- Automotive Electrical Systems 7
- Mechanical Systems and Power Accessories 7
- ACT Welding 2

**SUB-TOTAL** 16

GRADUATION REQUIREMENTS

- Job Search Strategies 1

**SUB-TOTAL** 1

It is a graduation requirement of the Automotive Collision Technology (ACT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

**PROGRAM TOTAL** 72-75
# AUTOMOTIVE COLLISION TECHNOLOGY

*Classification of Instructional Programs - 47.0603*

## Refinishing & Non-Structural Repair One-Year Certificate

### CORE CURRICULUM

<table>
<thead>
<tr>
<th>ACT</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>Non-Structural Analysis and Damage Repair</td>
</tr>
<tr>
<td>115</td>
<td>Refinishing Techniques</td>
</tr>
<tr>
<td>117</td>
<td>Specialized Non-Structural Applications</td>
</tr>
<tr>
<td>118</td>
<td>Specialized Paint Applications</td>
</tr>
<tr>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>20</strong></td>
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</tbody>
</table>

### GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see page 42-43)

Must Include:
- Three credit hours from Area 1. Oral & Written Communication
- Three credit hours from Area 5. Technical Literacy

May Not Include:
- NST 101 Network Fundamentals

<table>
<thead>
<tr>
<th></th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>SUB-TOTAL</strong></td>
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</table>

### PROGRAM REQUIREMENTS

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<thead>
<tr>
<th>ACT</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>156</td>
<td>Automotive Electrical Systems</td>
</tr>
<tr>
<td>051</td>
<td>Introductory Algebra</td>
</tr>
<tr>
<td>161</td>
<td>ACT Welding</td>
</tr>
<tr>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>13</strong></td>
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</table>

### GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>COM</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>125</td>
<td>Job Search Strategies</td>
</tr>
<tr>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

It is a graduation requirement of the Automotive Collision Technology (ACT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

**PROGRAM TOTAL**

### AUTOMOTIVE COLLISION TECHNOLOGY

*Classification of Instructional Programs - 47.0603*

## Structural & Mechanical Repair One-Year Certificate

### CORE CURRICULUM

<table>
<thead>
<tr>
<th>ACT</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>205</td>
<td>Structural Damage Analysis</td>
</tr>
<tr>
<td>206</td>
<td>Vehicle Repair Blueprinting</td>
</tr>
<tr>
<td>233</td>
<td>Repair Applications I</td>
</tr>
<tr>
<td>234</td>
<td>Repair Applications II</td>
</tr>
<tr>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>
GENERAL EDUCATION REQUIREMENTS

General Education Requirements 6
(see page 42-43)
Must Include:
  Three credit hours from Area 1. Oral & Written Communication 3
  AND
  Three credit hours from Area 5. Technical Literacy 3
May Not Include:
  NST 101 Network Fundamentals 3

SUB-TOTAL 6

PROGRAM REQUIREMENTS

AMT 257 Mechanical Systems & Power Accessories 7
MAT 051 Introductory Algebra 4
WLT 161 ACT Welding 2

SUB-TOTAL 13

GRADUATION REQUIREMENTS

COM 125 Job Search Strategies 1

SUB-TOTAL 1

It is a graduation requirement of the Automotive Collision Technology (ACT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

PROGRAM TOTAL 36

ACT 110 Non-Structural Analysis and Damage Repair. This course teaches students how to identify, analyze, and repair non-structural damage to vehicles, including personal safety practices, preparation, panel replacement, and alignment. Students also work with trim, metal straightening and repair methods, moveable glass, and hardware. 5 credit hours.

ACT 115 Refinishing Techniques. This course is an introduction to automotive finishes. Topics include preparing the equipment, the surface for refinishing, paint, and refinish materials; applying the finish; solving paint application problems; tinting and blending; color theory; and applying applicable safety and environmental practices. 5 credit hours.

ACT 117 Specialized Non-Structural Applications. This course covers specialized collision repair application processes including but not limited to aluminum repair and the uses of adhesives and foams in vehicle construction. Prerequisites: ACT 110 and ACT 115 with a grade of “C” or better. 5 credit hours.

ACT 118 Specialized Paint Applications. This course provides students with an understanding of waterborne paint processes and introduces theories and application of cycle time techniques. Prerequisites: ACT 110 and ACT 115 with a grade of “C” or better. 5 credit hours.

ACT 200 Sheet Metal Fabrication. This course teaches the skills and use of equipment needed to perform sheet metal fabrication of components related to performance and vintage vehicles. Prerequisite: WLT 128 or WLT 161 with a grade of “C” or better. 3 credit hours.

ACT 205 Structural Damage Analysis. This course teaches students to identify, analyze, and repair structural damage of vehicle bodies and vehicle body components. Welding methods are also covered. Prerequisites: ACT 117, ACT 118, and WLT 161 with a grade of “C” or better. 4 credit hours.
ACT 206  Vehicle Repair Blueprinting.  This course teaches students how to identify, analyze, plan, estimate, and repair structural damage to unibody and frame vehicles. Prerequisites: ACT 117, ACT 118, and WLT 161 with a grade of “C” or better.  4 credit hours.

ACT 220  Body Repair and Painting.  This course is an independent study course designed to develop and enhance the special interests of certificate students. Projects and topics will be individualized and will include research and application of theory. Prerequisites: ACT 205 and ACT 206 with a grade of “C” or better.  4 credit hours.

ACT 233  Repair Applications I.  This course includes the review and application of non-structural auto collision repair procedures covered in previous courses. Emphasis is given to applying industry specifications to the analysis and repair of actual and simulated auto collision work. An introduction to alternative fuel vehicles is also included. Prerequisites: ACT 205, ACT 206, and WLT 161 with a grade of “C” or better.  4 credit hours.

ACT 234  Repair Applications II.  This course includes the review and application of structural auto collision repair procedures covered in previous courses. Emphasis is given to applying industry specifications to the analysis and repair of actual and simulated auto collision work. Advanced aluminum repair techniques are also included. Prerequisites: ACT 205, ACT 206, and WLT 161 with a grade of “C” or better.  4 credit hours.

ACT 225  Collision Repair Internship.  This course will provide the student with a day-to-day knowledge of a working body shop. The student must fill out the required forms from the instructor. The instructor will visit with the student on the job to be sure that the requirements for the internship are being administered. Prerequisites: ACT 205 and ACT 206 with a grade of “C” or better.  8 credit hours.

ACT 299  Special Topics in Automotive Collision Technology.  Special Topics in Automotive Collision Technology (ACT) may include instruction on topics not covered in other ACT courses. Topics covered in other ACT courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits.  1-4 credit hours.
AUTOMOTIVE TECHNOLOGY

Classification of Instructional Programs - 47.0604

Associate of Applied Science Degree

General Option

Electric/Hybrid Vehicle Option

High Performance Option

Light-Duty Diesel Option

One-Year Certificates

General Automotive

Maintenance & Light Repair

State Technical College of Missouri offers the person who wants to become a skilled automotive service technician the opportunity to work in one of the best-equipped shops in Missouri under the supervision of competent, thoroughly trained instructors. The Automotive Technology program at State Technical College of Missouri is one of only a select few in the country that meets the strict industry standards required for National Automotive Technicians Education Foundation (NATEF) accreditation. As a result of its commitment to quality automotive service technology training, State Technical College of Missouri instructors are Automotive Service Excellence (ASE) certified Automobile Technicians in the areas they teach. The Automotive Technology program is also accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

Enrollment in the Automotive Technology program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions for the specific application requirements and deadline.

Students have four Automotive Technology Associate of Applied Science degree options from which to choose. All options fully educate students in the fundamentals of the automobile field so that they have a background that supports advancement within the industry or that allows them to begin a business of their own. The General Option includes instruction on all the systems of conventional gasoline powered vehicles. The Electric/Hybrid Vehicle Option includes instruction on systems specific to electric and hybrid powered vehicles. The Light-Duty Diesel Option includes instruction on light-duty diesel engines. The High Performance Option provides training in the modification and construction of performance vehicles used in motorsports. If time allows, students in the General Option may elect to take additional courses in welding, high performance modifications, electric/hybrid systems, and diesel engines to develop additional skills and should consult their advisors if they wish to do so.

Students may also choose to pursue a one-year technical certificate in General Automotive or Maintenance and Light Repair. Automotive Technology certificate students receive supportive training in related fields such as math, metal work, and communications.

The Automotive Technology program contributes to the green economy by teaching students to repair and maintain vehicles that may otherwise be discarded. Instruction on hybrid vehicles and alternative fuels is also included in the program. During their education, students use computers to diagnose and correct problems that affect automotive
emission systems to help reduce the carbon footprint. The program is recognized by the Mobile Air Conditioning Society (MACS) as complying with the 1990 United States Environmental Protection Agency (EPA) Clean Air Act requirements for refrigerant recovery and recycling to protect the environment. Solvents and other chemicals are recycled to help reduce water, air, and soil contamination.

Students who graduate with an Associate of Applied Science degree in Automotive Technology may pursue a second Associate of Applied Science degree in Automotive Collision Technology. Basic Welding (WLT 128) or ACT Welding (WLT 161) is a prerequisite for Automotive Technology students who wish to obtain a second degree or certificate in Automotive Collision Technology. The courses for the second Associate of Applied Science degree in Automotive Collision Technology will be offered in the same sequence and semester that they are being taught for the full-time Automotive Collision Technology program. The second Associate of Applied Science degree in Automotive Collision Technology may be completed in two semesters if scheduling permits.

It is a graduation requirement of the Automotive Technology (AMT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/transportationtech/amt/amtfacts/.

Program Mission

The mission of the Automotive Technology program is to prepare students with the higher education, technical, and interpersonal skills needed for employment in the challenging and highly technical career of Automotive Technology with the foundation for Automotive Service Excellence (ASE) Master Technician Certification.

Program Goals

The goals of the program are to provide the opportunity for students to develop:

- Effective communication skills.
- Critical thinking skills for troubleshooting and diagnostic techniques.
- Technical knowledge and understanding necessary for applied tasks in the eight Automotive Service Excellence (ASE) areas.
- Computer skills to find and research automotive data using multiple software databases and via the Internet.
- Skills in repairing and modifying automotive systems as appropriate for each program option.
- Personal social traits, which are essential for the successful automotive technician.
- A professional attitude toward the automotive industry including continuing education.

**CORE CURRICULUM**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>AMT 101</td>
<td>Automotive Electrical/Electronics I</td>
<td>4</td>
</tr>
<tr>
<td>AMT 120</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>AMT 145</td>
<td>Automotive Engine Mechanical</td>
<td>5</td>
</tr>
<tr>
<td>AMT 205</td>
<td>Automotive Brake Systems</td>
<td>4</td>
</tr>
<tr>
<td>AMT 206</td>
<td>Automotive Suspension and Steering</td>
<td>4</td>
</tr>
<tr>
<td>AMT 253</td>
<td>Automotive Drivetrains and Axles</td>
<td>9</td>
</tr>
<tr>
<td><strong>Optional:</strong></td>
<td><strong>Internship (Optional)</strong></td>
<td><strong>(6)</strong></td>
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<tr>
<td>HEO 151</td>
<td>Basic Commercial Driver License</td>
<td><strong>(1)</strong></td>
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<tr>
<td>HEO 152</td>
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<td><strong>29-37</strong></td>
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**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements

(see page 42-43)
May Not Include:
ASC 104 Human Anatomy and Physiology with Lab I 4
ASC 106 Human Anatomy and Physiology with Lab II 4
NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

### PROGRAM REQUIREMENTS

#### General Option

<table>
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<tr>
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<th>Course Name</th>
<th>Units</th>
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<tbody>
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<td>Automotive Electrical/Electronics II</td>
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<td>AMT 214</td>
<td>Automotive Electrical/Electronics III</td>
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<tr>
<td>AMT 207</td>
<td>Heating/Air Conditioning</td>
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**Optional:**

<table>
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<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>PMT 196</td>
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**SUB-TOTAL** 20-23

**OR**

#### Electric/Hybrid Vehicle Option

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<td>AMT 138</td>
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<tr>
<td>OR</td>
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<tr>
<td>AMT 243</td>
<td>Light-Duty Diesel Engines and Control Systems</td>
<td>6</td>
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<tr>
<td>AMT 207</td>
<td>Heating/Air Conditioning</td>
<td>5</td>
</tr>
<tr>
<td>AMT 214</td>
<td>Automotive Electrical/Electronics III</td>
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<tr>
<td>AMT 270</td>
<td>Electric/Hybrid Drive Systems</td>
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**SUB-TOTAL** 26

**OR**

#### High Performance Option

<table>
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<td>AMT 138</td>
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<tr>
<td>AMT 262</td>
<td>High Performance Drivetrains</td>
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<tr>
<td>AMT 265</td>
<td>Performance Suspension Design</td>
<td>5</td>
</tr>
<tr>
<td>ACT 200</td>
<td>Sheet Metal Fabrication</td>
<td>3</td>
</tr>
<tr>
<td>WLT 128</td>
<td>Basic Welding</td>
<td>3</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WLT 161</td>
<td>ACT Welding</td>
<td>2</td>
</tr>
<tr>
<td>WLT 225</td>
<td>Welding and Fabrication for High Performance Vehicles</td>
<td>2</td>
</tr>
<tr>
<td>PMT 196</td>
<td>Machining Essentials</td>
<td>3</td>
</tr>
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</table>

**SUB-TOTAL** 26-27

**OR**

#### Light-Duty Diesel Option

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
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<tbody>
<tr>
<td>AMT 207</td>
<td>Heating/Air Conditioning</td>
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<tr>
<td>AMT 214</td>
<td>Automotive Electrical/Electronics III</td>
<td>9</td>
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<tr>
<td>AMT 243</td>
<td>Light-Duty Diesel Engines and Control Systems</td>
<td>6</td>
</tr>
<tr>
<td>WLT 128</td>
<td>Basic Welding</td>
<td>3</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WLT 161</td>
<td>ACT Welding</td>
<td>2</td>
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</tbody>
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**Optional:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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</thead>
<tbody>
<tr>
<td>PMT 196</td>
<td>Machining Essentials</td>
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</tbody>
</table>

**SUB-TOTAL** 22-26
GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
<tr>
<td>SEM 135</td>
<td>Ford Maintenance &amp; Light Repair (MLR) Service Training Seminar</td>
<td>NC</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEM 145</td>
<td>Subaru-U Training Seminar</td>
<td>NC</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 1

It is a graduation requirement of the Automotive Technology (AMT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

**PROGRAM TOTAL** 69-84

AUTOMOTIVE TECHNOLOGY

Classification of Instructional Programs – 47.0604

General Automotive One-Year Certificate

Students may select either the General Automotive or Maintenance & Light Repair Certificate.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMT 101</td>
<td>Automotive Electrical/Electronics I</td>
<td>4</td>
</tr>
<tr>
<td>AMT 138</td>
<td>Automotive Electrical/Electronics II</td>
<td>6</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMT 243</td>
<td>Light-Duty Diesel Engines and Control Systems</td>
<td>6</td>
</tr>
<tr>
<td>SEM 135</td>
<td>Ford Maintenance &amp; Light Repair (MLR) Service Training Seminar</td>
<td>NC</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEM 145</td>
<td>Subaru-U Training Seminar</td>
<td>NC</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMT Electives</td>
<td>This certificate is custom-designed with instructor’s permission. 16 credits of Automotive Technology courses are required in addition to the one-year certificate core curriculum and general education requirements</td>
<td>16</td>
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</tbody>
</table>

**SUB-TOTAL** 26

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see page 42-43)

Must Include:

- Three credit hours from Area 1. Oral & Written Communication 3

AND

- Three credit hours from Area 5. Technical Literacy 3

May Not Include:

- NST 101 Network Fundamentals 3

**SUB-TOTAL** 6

PROGRAM REQUIREMENT

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 051</td>
<td>Introductory Algebra</td>
<td>4</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 4
GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 1

It is a graduation requirement of the Automotive Technology (AMT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

**PROGRAM TOTAL** 37

AUTOMOTIVE TECHNOLOGY

*Classification of Instructional Programs – 47.0604*

Maintenance & Light Repair One-Year Certificate

Students may select either the General Automotive or Maintenance & Light Repair Certificate.

**CORE CURRICULUM**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMT 101</td>
<td>Automotive Electrical/Electronics I</td>
<td>4</td>
</tr>
<tr>
<td>AMT 138</td>
<td>Automotive Electrical/Electronics II</td>
<td>6</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMT 243</td>
<td>Light-Duty Diesel Engines and Control Systems</td>
<td>6</td>
</tr>
<tr>
<td>AMT 205</td>
<td>Automotive Brake Systems</td>
<td>4</td>
</tr>
<tr>
<td>AMT 206</td>
<td>Automotive Suspension and Steering</td>
<td>4</td>
</tr>
<tr>
<td>AMT 207</td>
<td>Heating/Air Conditioning</td>
<td>5</td>
</tr>
<tr>
<td>SEM 135</td>
<td>Ford Maintenance &amp; Light Repair (MLR) Service Training Seminar</td>
<td>NC</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEM 145</td>
<td>Subaru-U Training Seminar</td>
<td>NC</td>
</tr>
<tr>
<td>Optional:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMT 120</td>
<td>Project Management</td>
<td>(3)</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 23-26

**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements
(see page 42-43)

Must Include:
- Three credit hours from Area 1. Oral & Written Communication 3
- Three credit hours from Area 5. Technical Literacy 3

May Not Include:
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 6

**PROGRAM REQUIREMENTS**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLT 128</td>
<td>Basic Welding</td>
<td>3</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WLT 161</td>
<td>ACT Welding</td>
<td>2</td>
</tr>
<tr>
<td>MAT 051</td>
<td>Introductory Algebra</td>
<td>4</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 6-7
GRADUATION REQUIREMENTS

COM 125 Job Search Strategies 1

SUB-TOTAL 1

It is a graduation requirement of the Automotive Technology (AMT) program for students to earn a grade of "C" or better in all "Core Curriculum" and "Program Requirements" courses.

PROGRAM TOTAL 36–40

AMT 101 Automotive Electrical/Electronics I. Theory/application of the operation and repair of electrical systems generally associated with the automotive engine. Includes the discussion and use of specific hand tools and equipment. Safety is stressed. 4 credit hours.

AMT 120 Project Management. This course is designed to give the student the opportunity to handle problems facing management, better equipping him/her for the automotive technician career. Some topics discussed include: keeping accurate records, merchandising, writing repair orders, figuring flat rate time, handling customer relations, and terminology as applied to the automotive industry. 3 credit hours.

AMT 138 Automotive Electrical/Electronics II. Application/service of electrical systems associated with the automotive engine. Theory/application/operation and diagnosis of automotive fuel and emission systems. Emphasis is put on an individual component operation, advanced system diagnostics, failure analysis, and proper service procedures. Safety is stressed. Prerequisite: AMT 101 with a grade of “C” or better. 6 credit hours.

AMT 145 Automotive Engine Mechanical. Theory/Construction/Operation of the internal combustion engine. Emphasis is put on proper diagnosis, failure analysis, and using the proper service procedures according to manufacturers specifications. Safety is stressed. 5 credit hours.

AMT 156 Automotive Electrical Systems. This course teaches the construction, operation and servicing of the electrical, air conditioning, and safety systems of the automobile as applied to collision repair. Battery, starting and generating systems, and power accessories are also covered. 7 credit hours.

AMT 191 Internship (Optional). The optional internship is a paid work experience in the automotive industry that develops and reinforces the student’s skills. The minimum hours worked will be 320 hours. Only Associate of Applied Science degree students who have successfully completed at least 12 credit hours of AMT classes and earned a 2.500 GPA in all classes are eligible for the AMT internship. Prerequisites: AMT 101, AMT 138, AMT 145 or AMT 101, AMT 145, MHT 255 and Department Chair approval. 6 credit hours.

AMT 205 Automotive Brake Systems. Theory/Application/Service of the automotive brake systems components. Emphasis is given to live work, diagnosis, failure analysis, and following service procedures as outlined by the manufacturer. A component of electronic brake systems is also included. Safety is stressed. 4 credit hours.

AMT 206 Automotive Suspension and Steering. Theory/Application/Service of the automotive suspension and steering system components. Emphasis is given to live work, diagnosis, failure analysis, and following service procedures as outlined by the manufacturer. A component of electronic suspension systems and wheel alignment is also included. Safety is stressed. 4 credit hours.

AMT 207 Heating/Air Conditioning. Theory/Application/Service of the component functions of the heating and air conditioning systems. Emphasis is given to live work diagnosis, failure analysis, and following the proper service procedures as outlined by the manufacturers specifications. Special emphasis is put on the proper handling of refrigerants. Safety is stressed. 5 credit hours.

AMT 214 Automotive Electrical/Electronics III. Theory/Application/Service of electronic type power accessories with emphasis put on failure analysis and proper service procedures. Special emphasis is put on accessories such as electric windows, door locks, electric seats, cruise controls, and body computers. Will have a large component of advanced engine performance and electronic diagnostics. Safety is stressed. Corequisites: AMT 101 and AMT 138 or AMT 243 with a grade of “C” or better. 9 credit hours.
AMT 243  Light-Duty Diesel Engines and Control Systems. Theory, application, and service of light-duty diesel engine fuel and electronic engine management systems. Corequisite: AMT 101 with a grade of “C” or better. 6 credit hours.

AMT 253  Automotive Drivetrains and Axles. Theory, application, and service of the components used in automotive and light truck drivertrain systems. Emphasis is given to live work diagnosis, failure analysis, and following proper service procedures as outlined by the manufacturers specifications. Safety is stressed. 9 credit hours.

AMT 262  High Performance Drivetrains. This course teaches modification and design of engines and transmissions used in high performance vehicles. Emphasis will be on safety, selecting proper components, and calculating vehicle demand. Prerequisite: AMT 145 with a grade of “C” or better. 5 credit hours.

AMT 265  Performance Suspension Design. This course teaches performance suspension modifications for motorsports competition vehicles. Prerequisites: AMT 205 and AMT 206 with a grade of “C” or better. 5 credit hours.

AMT 257  Mechanical Systems and Power Accessories. This course teaches the theory, application, and servicing of automobile mechanical systems as applied to collision repair. Emphasis is placed on brake, suspension, and steering systems. 7 credit hours.

AMT 270  Electric/Hybrid Drive Systems. This course teaches the theory, application, operation, and diagnosis of automotive electrical and hybrid propulsion systems. Emphasis is on individual component operation, proper testing, and diagnosis as outlined by the manufacturer. Safety is stressed. Corequisite: AMT 138 or AMT 243 with a grade of “C” or better. 6 credit hours.

AMT 299  Special Topics in Automotive Technology. Special Topics in Automotive Technology (AMT) may include instruction on topics not covered in other AMT courses. Topics covered in other AMT courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
The Aviation Maintenance program prepares individuals for employment in the aircraft maintenance industry. Aircraft mechanics are employed by the airlines, aircraft manufacturing companies, repair stations, the United States military, and general aviation fixed base operators. Some mechanics specialize in work on a particular part of an aircraft, such as metal or fabric surfaces, avionics equipment, hydraulic systems, landing gear, propellers or engines. Others, particularly those employed by the smaller fixed base operators, work on many different aircraft systems and may inspect and repair many different types of aircraft. State Technical College of Missouri has been certified by the Federal Aviation Administration (FAA) as an Aviation Maintenance Technician School since 1970. The Aviation Maintenance program is also accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

The program provides extensive hands-on training in small classes with well-trained teachers. Equipment and curriculum are up-to-date and include non-destructive testing, composites, electrical systems troubleshooting and reciprocating and turbine engine theory and maintenance, to name a few.

Many jobs in the aircraft maintenance industry require mechanics that are certified by the Federal Aviation Administration (FAA). Two ratings are applicable to this certification: Airframe and Powerplant. Three options are offered in Aviation Maintenance: an Associate of Applied Science (AAS) in Aviation Maintenance, a certificate in Aviation Maintenance (Powerplant), and a certificate in Aviation Maintenance (Airframe). The AAS degree program provides the experience required to obtain the aircraft mechanic certificate with Airframe and Powerplant ratings. Each certificate program provides the experience required to obtain the aircraft mechanic certificate with the rating appropriate for the program completed.

The Aviation Maintenance program is divided into three sections: General, Airframe and Powerplant. Students enrolled in the Associate of Applied Science degree program typically complete the General and Powerplant sections by the end of the second semester, and the Airframe section by the end of the fourth semester.

The Aviation Maintenance Associate of Applied Science degree graduation requirements are for students to: 1) earn a grade of C (70%) or better in all "Core Curriculum" courses, 2) pass the FAA General and Powerplant or Airframe written examinations, and 3) pass the FAA Oral and Practical examinations for the General and Powerplant or Airframe sections.

The Aviation Maintenance Powerplant One-Year Certificate graduation requirements are for students to: 1) earn a grade of C (70%) or better in all "Core Curriculum" courses and 2) take and pass the FAA General and FAA Powerplant written examinations.
The Aviation Maintenance Airframe One-Year Certificate graduation requirements are for students to: 1) earn a grade of C (70%) or better in all "Core Curriculum" courses and 2) take and pass the FAA General and FAA Airframe written examinations.

To view program outcome data, visit https://www.statetechmo.edu/programs/transportationtech/tam/tamfacts/.

Program Mission
The mission of the Aviation Maintenance program is to provide individuals with opportunities for educational experiences that enable them to develop the skills necessary for employment in the aviation maintenance industry.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Technical skills necessary for employment in the aviation maintenance industry.
- Technical knowledge necessary to earn mechanic certification, required by Federal Aviation Regulation, Part 65.
- Core general education skills in reading, writing, mathematics, and science reasoning.

**CORE CURRICULUM**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAM 107</td>
<td>Federal Regulations for Aviation Technicians</td>
<td>2</td>
</tr>
<tr>
<td>TAM 109</td>
<td>Aircraft Structural Materials and Corrosion Control</td>
<td>2</td>
</tr>
<tr>
<td>TAM 113</td>
<td>General Mechanics</td>
<td>2</td>
</tr>
<tr>
<td>TAM 125</td>
<td>Basic Electricity</td>
<td>2</td>
</tr>
<tr>
<td>TAM 127</td>
<td>Reciprocating Engines and Lubrication Systems</td>
<td>4</td>
</tr>
<tr>
<td>TAM 131</td>
<td>Propeller Systems</td>
<td>2</td>
</tr>
<tr>
<td>TAM 134</td>
<td>Turbine Engines and Accessory Systems</td>
<td>4</td>
</tr>
<tr>
<td>TAM 136</td>
<td>Powerplant Fuel Systems</td>
<td>2</td>
</tr>
<tr>
<td>TAM 139</td>
<td>Powerplant Electrical Systems</td>
<td>4</td>
</tr>
<tr>
<td>TAM 155</td>
<td>Aviation Mathematics, Physics, Weight &amp; Balance, and Human Factors</td>
<td>3</td>
</tr>
<tr>
<td>TAM 200</td>
<td>Auxiliary Systems and Inspections for Powerplants</td>
<td>5</td>
</tr>
<tr>
<td>TAM 208</td>
<td>Introduction to Aircraft Welding</td>
<td>2</td>
</tr>
<tr>
<td>TAM 211</td>
<td>Assembly and Rigging</td>
<td>2</td>
</tr>
<tr>
<td>TAM 213</td>
<td>Sheetmetal and Non-metallic Structures</td>
<td>4</td>
</tr>
<tr>
<td>TAM 217</td>
<td>Aircraft Fluid Power Systems</td>
<td>2</td>
</tr>
<tr>
<td>TAM 220</td>
<td>Aircraft Covering, Finishes and Woods</td>
<td>2</td>
</tr>
<tr>
<td>TAM 224</td>
<td>Aircraft Instrumentation and Avionics Systems</td>
<td>3</td>
</tr>
<tr>
<td>TAM 226</td>
<td>Aircraft Electrical Systems</td>
<td>4</td>
</tr>
<tr>
<td>TAM 228</td>
<td>Airframe Systems and Inspections</td>
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<tr>
<td><strong>SUB-TOTAL</strong></td>
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<td><strong>53</strong></td>
</tr>
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**GENERAL EDUCATION REQUIREMENTS**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credit Hours</th>
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<tr>
<td>General Education Requirements</td>
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<tr>
<td>May Not Include:</td>
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</tr>
<tr>
<td>ASC 104 Human Anatomy and Physiology with Lab I</td>
<td>4</td>
</tr>
<tr>
<td>ASC 106 Human Anatomy and Physiology with Lab II</td>
<td>4</td>
</tr>
<tr>
<td>NST 101 Network Fundamentals</td>
<td>3</td>
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<tr>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>
The Aviation Maintenance Associate of Applied Science degree graduation requirements are for students to: 1) earn a grade of C (70%) or better in all "Core Curriculum" courses, 2) pass the FAA General and Powerplant or Airframe written examinations, and 3) pass the FAA Oral and Practical examinations for the General and Powerplant or Airframe sections.

**PROGRAM TOTAL** 73

### AVIATION MAINTENANCE

*Classification of Instructional Programs – 47.0608*

Powerplant One-Year Certificate

### CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAM 107</td>
<td>Federal Regulations for Aviation Technicians</td>
<td>2</td>
</tr>
<tr>
<td>TAM 109</td>
<td>Aircraft Structural Materials and Corrosion Control</td>
<td>2</td>
</tr>
<tr>
<td>TAM 113</td>
<td>General Mechanics</td>
<td>2</td>
</tr>
<tr>
<td>TAM 125</td>
<td>Basic Electricity</td>
<td>2</td>
</tr>
<tr>
<td>TAM 127</td>
<td>Reciprocating Engines and Lubrication Systems</td>
<td>4</td>
</tr>
<tr>
<td>TAM 131</td>
<td>Propeller Systems</td>
<td>2</td>
</tr>
<tr>
<td>TAM 134</td>
<td>Turbine Engines and Accessory Systems</td>
<td>4</td>
</tr>
<tr>
<td>TAM 136</td>
<td>Powerplant Fuel Systems</td>
<td>2</td>
</tr>
<tr>
<td>TAM 139</td>
<td>Powerplant Electrical Systems</td>
<td>4</td>
</tr>
<tr>
<td>TAM 155</td>
<td>Aviation Mathematics, Physics, Weight &amp; Balance, and Human Factors</td>
<td>3</td>
</tr>
<tr>
<td>TAM 200</td>
<td>Auxiliary Systems and Inspections for Powerplants</td>
<td>5</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 32

### GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see page 42-43)

Must Include:

- Three credit hours from Area 1. Oral & Written Communication

AND

- Three credit hours from Area 5. Technical Literacy

May Not Include:

- NST 101 Network Fundamentals

**SUB-TOTAL** 6
The Aviation Maintenance Powerplant One-Year Certificate graduation requirements are for students to: 1) earn a grade of C (70%) or better in all "Core Curriculum" courses and 2) take and pass the FAA General and FAA Powerplant written examinations.

**PROGRAM TOTAL** 39

**AVIATION MAINTENANCE**

*Classification of Instructional Programs – 47.0607*

Airframe One-Year Certificate

**CORE CURRICULUM**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAM 107</td>
<td>Federal Regulations for Aviation Technicians</td>
</tr>
<tr>
<td>TAM 109</td>
<td>Aircraft Structural Materials and Corrosion Control</td>
</tr>
<tr>
<td>TAM 113</td>
<td>General Mechanics</td>
</tr>
<tr>
<td>TAM 125</td>
<td>Basic Electricity</td>
</tr>
<tr>
<td>TAM 155</td>
<td>Aviation Mathematics, Physics, Weight &amp; Balance, and Human Factors</td>
</tr>
<tr>
<td>TAM 208</td>
<td>Introduction to Aircraft Welding</td>
</tr>
<tr>
<td>TAM 211</td>
<td>Assembly and Rigging</td>
</tr>
<tr>
<td>TAM 213</td>
<td>Sheet Metal and Non-metallic Structures</td>
</tr>
<tr>
<td>TAM 217</td>
<td>Aircraft Fluid Power Systems</td>
</tr>
<tr>
<td>TAM 220</td>
<td>Aircraft Covering, Finishes and Woods</td>
</tr>
<tr>
<td>TAM 224</td>
<td>Aircraft Instrumentation and Avionics Systems</td>
</tr>
<tr>
<td>TAM 226</td>
<td>Aircraft Electrical Systems</td>
</tr>
<tr>
<td>TAM 228</td>
<td>Airframe Systems and Inspections</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 32

**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements

(see page 42-43)

Must Include:

Three credit hours from Area 1. Oral & Written Communication

AND

Three credit hours from Area 5. Technical Literacy

May Not Include:

NST 101 Network Fundamentals

**SUB-TOTAL** 6
The Aviation Maintenance Airframe One-Year Certificate graduation requirements are for students to: 1) earn a grade of C (70%) or better in all “Core Curriculum” courses and 2) take and pass the FAA General and FAA Airframe written examinations.

**GRADUATION REQUIREMENTS**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
</tr>
<tr>
<td><strong>SUB-TOTAL</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

**PROGRAM TOTAL** 39

**TAM 107 Federal Regulations for Aviation Technicians.** This course concerns the Federal Aviation Regulations governing aircraft maintenance and mechanic privileges and responsibilities associated with that maintenance. Students learn research techniques on the Avantext software system in the computer laboratory. In addition they are taught rudimentary drawing and sketching techniques to use in filling out FAA forms, reading manuals and diagrams and how to make maintenance record entries. The general curriculum subjects included in this course and required by FAR Part 147, Appendix B, are as follows: Aircraft Drawings, Maintenance Forms and Records, Maintenance Publications, Mechanic Privileges and Limitations. 2 credit hours.

**TAM 109 Aircraft Structural Materials and Corrosion Control.** Major topics in this course include structural materials identification, metalworking and fabrication processes, non-destructive testing procedures and corrosion treatment and prevention. The general curriculum subjects included in this course and required by FAR Part 147, Appendix B, are as follows: Corrosion Control and Materials and Processes. 2 credit hours.

**TAM 113 General Mechanics.** Ground operation and servicing topics covered include shop and flight line safety including fire safety and procedures, jacking safety, hazardous materials procedures, tie-down techniques, standard hand signals, and fueling safety and procedures. Servicing with ground power units, oxygen and other related items used on aircraft are discussed and performed in the laboratory. Towing and taxing aircraft, including engine starting procedures are also part of the laboratory activities. Fluid lines and fittings topics covered are materials and hardware required to fabricate all types of both rigid and flexible fluid lines. Fabrication techniques and installation procedures are included in the laboratory activities. The general curriculum subjects included in this course and required by FAR Part 147, Appendix B, are as follows: Ground Operation and Servicing and Fluid Lines and Fittings. 2 credit hours.

**TAM 125 Basic Electricity.** Basic electricity theory is covered in this course including static and current electricity, basic electrical units, terminology and magnetism. Circuit components are discussed and complex DC circuits are analyzed using Ohm’s Law and power formulas. Different methods of generating electrical energy are covered and laboratory projects include fabrication and testing of circuits containing a variety of components. A unit on the theory, testing and maintenance of batteries rounds out the DC phase of this course. Primary and secondary batteries including lead-acid and nickel-cadmium types are included. The AC phase of the course involves mathematically analyzing inductive and capacitive circuits including power formulas. Solid-state devices are introduced and theory discussed. A final unit on testing and troubleshooting is covered in this course. Extensive laboratory projects are used in this phase. The general curriculum subject included in this course and required by FAR Part 147, Appendix B, is Basic Electricity. 2 credit hours.

**TAM 127 Reciprocating Engines and Lubrication Systems.** The history, theory, design, development and maintenance of aircraft reciprocating engines and the terminology and techniques associated therewith are addressed in this course. A study of lubrication systems for both, reciprocating engines and turbine engines is also included. Laboratory activities may include disassembly, reassembly, overhaul, repair, inspection, removal, installation, rigging and testing of aircraft reciprocating engines and engine lubrication systems. This course provides the opportunity for students to develop skills in the use of maintenance publications and the documentation of maintenance activities. The powerplant curriculum subjects included in this course and required by FAR Part 147, Appendix D are as follows: Reciprocating Engines and Lubrication Systems. 4 credit hours.
TAM 131 Propeller Systems. The lecture portion of this course addresses the history, development, theory of operation and application of fixed-pitch propellers through constant-speed propellers with reverse and feather features. In lab, students may remove, replace, inspect, service, or repair propellers, propeller accessories, or propeller auxiliary systems. The use of maintenance publications, and the documentation of maintenance activities will be emphasized. The powerplant curriculum subject included in this course and required by FAR Part 147, Appendix D is Propellers. 2 credit hours.

TAM 134 Turbine Engines and Accessory Systems. Thorough reviews of the history, development, design, theory and application of various types of turbine engines, and auxiliary systems for both, reciprocating engines and turbines engines, are provided in the lecture portion of this course. Lab activities may include the removal and replacement, inspection, overhaul, repair and adjustment of turbine engines, and auxiliary systems for reciprocating engines and turbine engines. The powerplant curriculum subjects included in this course and required by FAR Part 147, Appendix D, are as follows: Turbine Engines, Auxiliary Power Units, Unducted Fans, Engine Cooling Systems, Engine Exhaust and Reverser Systems, Induction and Engine Airflow Systems. 4 credit hours.

TAM 136 Powerplant Fuel Systems. In this course, students learn about aircraft fuels, engine fuel systems components and fuel metering devices. Lecture topics include float carburetors, pressure injection carburetors, fuel injection systems and turbine engine fuel controls. Laboratory activities may include the inspection, service and repair of fuel systems, pumps, valves, filters, and metering units. The Powerplant curriculum subjects included in this course and required by FAR Part 147, Appendix D, are Fuel Metering Systems and Engine Fuel Systems. 2 credit hours.

TAM 139 Powerplant Electrical Systems. Aircraft charging systems, motors and engine starting and ignition systems are the major topics in this course. In lab, students may inspect powerplant electrical systems installation, and inspect, service and repair electrical systems components. The powerplant curriculum subjects included in this course and required by FAR Part 147, Appendix D, are Engine Electrical Systems and Ignition and Starting Systems. 4 credit hours.

TAM 155 Aviation Mathematics, Physics, Weight & Balance, and Human Factors. Mathematics concepts covered in this course include roots, powers, area, volume, ratio, proportion, percentage, and algebraic operations. Physics concepts, with particular application in the aviation maintenance field, covered in this course include matter, energy, work, power, force, motion, and gas and fluid mechanics. These principles, together with Newton’s laws and atmospheric science are then used to introduce aerodynamics for fixed and rotor wing aircraft. This course also covers aircraft weight and balance theory and terminology, FAA requirements for documentation, practical problems, and application. Laboratory activities include actual weighing of an aircraft and related computations. Also included are practical problems involving aircraft alterations with related weight and balance computations, adverse loading checks, and ballast and weight shift problems. Human factors are covered in this course with an emphasis on common maintenance problems, situational awareness, and basic human factors techniques and applications. The general curriculum subjects included in this course and required by FAR Part 147, Appendix B, are Mathematics, Basic Physics, and Weight and Balance. 3 credit hours.

TAM 200 Auxiliary Systems and Inspections for Powerplants. All of the subject areas in the powerplant curriculum culminate in this course, to provide students with the opportunity to hone skills learned earlier. Periodic inspections of reciprocating or turbine engines, propellers or engine accessories are typical activities in lab. These inspections include extensive research of maintenance publications and effective documentation of inspection activities. Students may also inspect, service and repair, fire protection systems and powerplant instrument systems. The powerplant curriculum subjects included in this course and required by FAR Part 147, Appendix D are as follows: Engine Fire Protection Systems, Engine Instrument Systems and Engine Inspections. Prerequisite: At least eight credit hours of course work in the powerplant curriculum, or the transfer of an equivalent course work, or documentation of significant experience in the maintenance of aircraft engines, or instructor’s permission are requirements for entry into this course. 5 credit hours.
TAM 208 Introduction to Aircraft Welding. This course focuses on the various types of welding used with aircraft structural materials. Introduces the student to oxy-gas welding as well as arc welding. Includes introduction to soldering and brazing of steel sheet and tube steel. Students will demonstrate skills in the fabrication and repair of a steel tube cluster as outlined in AC-43.13 1B. The airframe curriculum subject included in this course and required by FAR Part 147, Appendix C, is Welding. 2 credit hours.

TAM 211 Assembly and Rigging. Assembly and rigging (adjustment) of aircraft primary structures (wings, stabilizers and landing gear), and primary and secondary flight controls (ailerons, rudders trim tabs, etc.) is the primary emphasis of this course. A review of aerodynamics for fixed and rotor wing aircraft is also included. The airframe curriculum subject included in this course and required by FAR Part 147, Appendix C, is Assembly and Rigging. 2 credit hours.

TAM 213 Sheetmetal and Non-metallic Structures. Provides foundation for understanding design and construction, as related to sheetmetal and non-metallic aircraft structures. Introduces students to the various materials used in aircraft fabrication and repair. Laboratory activities include selection and installation of various fasteners, installation of conventional rivets, sheetmetal flat layouts and rivet pattern layouts. Provides knowledge of composite structural designs, inspection methods, fabrication and repair procedures. The airframe curriculum subject included in this course and required by FAR Part 147, Appendix C, is Sheetmetal and Non-metallic Structures. 4 credit hours.

TAM 217 Aircraft Fluid Power Systems. This course covers physical principles and mathematical analysis of hydraulic systems, characteristics of different types of hydraulic fluids, small and large aircraft hydraulic systems and their applications, different types of hydraulic control systems and pneumatic systems. Various types of aircraft landing gear are covered, including aircraft ground steering systems, wheels, tires, braking systems, landing gear shock struts and related hardware. All types of braking systems are studied from simple mechanically operated brakes to hydraulically boosted systems with anti-skid systems on large aircraft. Aircraft tires and tubes are covered thoroughly including inspection, removal and replacement. All subjects in this course emphasize laboratory projects involving disassembly, inspection, repair and installation of components on aircraft. Retractable landing gear hydraulic systems are thoroughly studied including electrical control, position and warning systems. The airframe curriculum subjects included in this course and required by FAR Part 147, Appendix C, are as follows: Aircraft Landing Gear Systems, Hydraulic and Pneumatic Power Systems, Position and Warning Systems. 2 credit hours.

TAM 220 Aircraft Covering, Finishes and Woods. The covering of exterior surfaces and internal structures, to prevent corrosion, as well as to beautify, is one of the major areas of aircraft maintenance. In this course, students learn about aircraft wooden structures, fabric coverings for aircraft structures, and the various paints and sealers used to protect them. Students also learn techniques for the inspection, and preparation prior to sealing and painting of wood and metal aircraft structures, and wood, metal and fabric surfaces. The airframe curriculum subjects included in this course and required by FAR Part 147, Appendix C, are as follows: Aircraft Coverings, Aircraft Finishes, and Wood Structures. 2 credit hours.

TAM 224 Aircraft Instrumentation and Avionics Systems. Most aircraft operating under visual flight rules typically include instruments to indicate flight conditions such as attitude, altitude, airspeed and heading, other instruments to indicate engine and airframe systems conditions, and VHF radios for communication and navigation. A transponder, and other systems, to interact with the local air traffic control are necessary for instrument flight rules. In this course, students learn how these systems work, the regulations that pertain to them, and how to install, inspect, and check systems components for operation. The airframe curriculum subjects included in this course and required by FAR Part 147, Appendix C, are as follows: Aircraft Instrument Systems and Communication and Navigation Systems. 3 credit hours.

TAM 226 Aircraft Electrical Systems. This course addresses the operation and maintenance of electrical charging systems and power distribution systems for large and small aircraft as well as the fabrication and installation of electrical wiring and electrical systems components. The airframe curriculum subject included in this course and required by FAR Part 147, Appendix C is Aircraft Electrical Systems. 4 credit hours.
TAM 228  Airframe Systems and Inspections. Provides detailed instruction of airframe auxiliary systems. Includes cabin pressurization control, ice and rain systems, airframe fire protection and basic aircraft fuel systems. Learning opportunities include inspection, repair overhaul and servicing of such systems. Students will demonstrate troubleshooting skills using proper procedures and practices as outlined by the manufacturer. FAA airframe inspection requirements and proper logbook entries are also discussed. The airframe curriculum subjects included in this course and required by FAR Part 147, Appendix C, are as follows: Cabin Atmosphere, Ice and Rain Control Systems, Aircraft Fuel Systems, Fire Protection and Airframe Inspection. 2 credit hours.

TAM 299  Special Topics in Aviation Maintenance. Special Topics in Aviation Maintenance (TAM) may include instruction on topics not covered in other TAM courses. Topics covered in other TAM courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
Increasing use of technology and organizational restructuring results in the need for employees to have higher levels of business knowledge and computer and other associated skills. The Business Administration program is designed to meet these current business and industry trends. It also serves as a broad entry-level starting point for those individuals who are transitioning into a new career.

Students are taught to create, implement, and use business, accounting and information systems that are essential for organizations to accomplish their mission and goals. Students learn to solve problems both manually and with the aid of information technology. The program prepares its graduates for entry-level positions such as accounting technician, administrative assistant, computer support specialist, office manager or assistant office manager, administrative services manager or assistant administrative services manager, retail manager, human resources technician, marketing assistant, executive assistant, and bookkeeping or accounting assistant in a variety of business enterprises, government agencies, and organizations. In addition, the program provides an opportunity for technicians and other skilled workers to benefit from an education in business, entrepreneurship, and management principles.

Students seeking an Associate of Applied Science (AAS) degree may choose from three options. These options give students a solid foundation in management, information systems, accounting, analytical, and communication skills. The General Option develops knowledge in various areas of business, accounting, and entrepreneurship. The Accounting Option builds additional accounting skills. The Technical Specialty Option develops business and management skills from the base skills taught in the designated technical area other than Business Administration. Students may also choose to obtain a Business Administration certificate.

For students who elect to major in multiple Business Administration AAS degree options, courses will be offered in the same sequence and semester that they are regularly taught. Accounting courses with the ACC course prefix may not be duplicated to satisfy program requirements for completion of multiple Business Administration AAS degree options. See a Business Administration advisor for information on how long it will take to complete multiple degree options.

It is a graduation requirement of the Business Administration (BUS) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/computertech/bus/busfacts/.

Program Mission

The program prepares graduates for entry-level business, management, accounting, and administrative positions in a variety of organizations, including governmental agencies. Students are provided with an opportunity to develop their skills in various areas, including office and project management, accounting, entrepreneurship, business technology, and communication. Students learn to solve problems both manually and with the aid of business technology.
**Program Goals**
The goals of the program are to provide the opportunity for students to develop:
- Oral and written communication skills.
- Analytical approaches to problem solving.
- Knowledge and skills in information technology.
- Knowledge and skills in office operations and management.
- Knowledge and skills in accounting principles, methods, systems, and internal controls.

**CORE CURRICULUM**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 103</td>
<td>Accounting Principles I</td>
<td>3</td>
</tr>
<tr>
<td>ACC 104</td>
<td>Accounting Principles II</td>
<td>3</td>
</tr>
<tr>
<td>ACC 110</td>
<td>Accounting and Business Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>BUS 122</td>
<td>Advanced Microsoft Excel</td>
<td>3</td>
</tr>
<tr>
<td>BUS 150</td>
<td>Business Principles</td>
<td>3</td>
</tr>
<tr>
<td>BUS 162</td>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>BUS 170</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>BUS 172</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>BUS 211</td>
<td>Management</td>
<td>3</td>
</tr>
<tr>
<td>COM 102</td>
<td>English Composition II: Writing the Research Paper</td>
<td>3</td>
</tr>
</tbody>
</table>

SUB-TOTAL: 30

**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements: 19
(see page 42-43)
May Not Include:
MAT 119 Elementary Statistics: 3

SUB-TOTAL: 19

**PROGRAM REQUIREMENTS**

**General Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 223</td>
<td>Advanced Microsoft Access</td>
<td>3</td>
</tr>
<tr>
<td>BUS 260</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>MAT 119</td>
<td>Elementary Statistics</td>
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Choose four of the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 208</td>
<td>Intermediate Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 212</td>
<td>Income Tax</td>
<td>3</td>
</tr>
<tr>
<td>ACC 265</td>
<td>Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 295</td>
<td>Fund and Governmental Accounting</td>
<td>3</td>
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<tr>
<td>BUS 140</td>
<td>Internship</td>
<td>4</td>
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<tr>
<td>BUS 176</td>
<td>Marketing</td>
<td>3</td>
</tr>
<tr>
<td>BUS 230</td>
<td>Business Finance</td>
<td>3</td>
</tr>
<tr>
<td>BUS 290</td>
<td>Essentials of Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>CPP 237</td>
<td>Internet Programming</td>
<td>3</td>
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</tbody>
</table>

SUB-TOTAL: 21-22

**Accounting Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ACC 208</td>
<td>Intermediate Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 212</td>
<td>Income Tax</td>
<td>3</td>
</tr>
<tr>
<td>ACC 265</td>
<td>Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 295</td>
<td>Fund and Governmental Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BUS 140</td>
<td>Internship</td>
<td>4</td>
</tr>
</tbody>
</table>

OR

79
BUS 230  Business Finance  3
BUS 223  Advanced Microsoft Access  3
OR
BUS 260  Project Management  3
MAT 119  Elementary Statistics  3
SUB-TOTAL  21-22

OR

Technical Specialty Option
BUS 223  Advanced Microsoft Access  3
BUS 260  Project Management  3
Electives  Approved electives from any technical specialty area other than Business Administration with a grade of “C” or better.
SUB-TOTAL  21

COM 125  Job Search Strategies  1

SUB-TOTAL  1

GRADUATION REQUIREMENTS
It is a graduation requirement of the Business Administration (BUS) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

PROGRAM TOTAL  71-72

BUSINESS ADMINISTRATION
Classification of Instructional Programs – 52.0204
One-Year Certificate

CORE CURRICULUM

<table>
<thead>
<tr>
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</tr>
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<tbody>
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<td>ACC 103</td>
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<td>ACC 104</td>
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<tr>
<td>ACC 110</td>
<td>Accounting and Business Information Systems</td>
</tr>
<tr>
<td>BUS 150</td>
<td>Business Principles</td>
</tr>
<tr>
<td>BUS 170</td>
<td>Principles of Macroeconomics</td>
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<tr>
<td>BUS 211</td>
<td>Management</td>
</tr>
<tr>
<td>MAT 071</td>
<td>Intermediate Algebra</td>
</tr>
<tr>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>22</strong></td>
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</table>

GENERAL EDUCATION REQUIREMENTS

General Education Requirements  6
(see page 42-43)
Must Include:
COM 101 English Composition  3
AND
Three credit hours from Area 5. Technical Literacy  3

SUB-TOTAL  6
PROGRAM REQUIREMENTS

Choose two of the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BUS 122</td>
<td>Advanced Microsoft Excel</td>
<td>3</td>
</tr>
<tr>
<td>BUS 140</td>
<td>Internship</td>
<td>4</td>
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<tr>
<td>BUS 162</td>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>BUS 172</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>BUS 176</td>
<td>Marketing</td>
<td>3</td>
</tr>
<tr>
<td>BUS 223</td>
<td>Advanced Microsoft Access</td>
<td>3</td>
</tr>
<tr>
<td>BUS 230</td>
<td>Business Finance</td>
<td>3</td>
</tr>
<tr>
<td>BUS 260</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>BUS 290</td>
<td>Essentials of Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>ACC 208</td>
<td>Intermediate Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 212</td>
<td>Income Tax</td>
<td>3</td>
</tr>
<tr>
<td>ACC 265</td>
<td>Managerial Accounting</td>
<td>3</td>
</tr>
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<td>ACC 295</td>
<td>Fund and Governmental Accounting</td>
<td>3</td>
</tr>
<tr>
<td>CPP 237</td>
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<td>3</td>
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<tr>
<td>MAT 119</td>
<td>Elementary Statistics</td>
<td>3</td>
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<td>Elective</td>
<td>Approved elective from any technical specialty area other than Business Administration with a grade of “C” or better.</td>
<td>2-3</td>
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<tr>
<td>Elective</td>
<td>Approved elective from any technical specialty area other than Business Administration with a grade of “C” or better.</td>
<td>3-4</td>
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</table>

SUB-TOTAL: 5-8

GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
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</table>

SUB-TOTAL: 1

It is a graduation requirement of the Business Administration (BUS) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

PROGRAM TOTAL: 34-37

ACC 103  Accounting Principles I. Fundamentals of accounting and their application to a sole proprietorship and partnership. 3 credit hours.

ACC 104  Accounting Principles II. This course teaches the fundamental principles of accounting for partnerships and corporations as well as managerial accounting principles and techniques. Prerequisite: ACC 103 with a grade of “C” or better. 3 credit hours.

ACC 110  Accounting and Business Information Systems. Students develop an understanding of the personnel and payroll records that provide the information required by the numerous laws affecting the operation of the payroll system. Prerequisite: ACC 103 with a grade of “C” or better. 3 credit hours.

ACC 208  Intermediate Accounting. Preparation of financial statements for a business entity. Organization, interpretation, classification and determination of content and values of accounts. This course is a combination of lecture and lab. Prerequisite: ACC 104 with a grade of “C” or better. 3 credit hours.

ACC 212  Income Tax. Principles and procedures required by current laws and regulations relating to federal income taxes and social security taxes with practical applications emphasized. This course is a combination of lecture and lab. 3 credit hours.
ACC 265  Managerial Accounting. This course introduces students to information needed by managers to carry out the essential functions in an organization: planning, operations, controlling activities, and making decisions. Corequisite: ACC 104. 3 credit hours.

ACC 295  Fund and Governmental Accounting. This course introduces students to the study of the accounting and reporting concepts, standards, and procedures applicable to city, county, and state government, and not-for-profit institutions. Prerequisite: ACC 104 with a grade of “C” or better. 3 credit hours.

BUS 107  Microsoft Publisher and PowerPoint. This course instructs students on using the fundamental through advanced features of Microsoft Publisher and PowerPoint to effectively present information. 3 credit hours.

BUS 115  Advanced Microsoft Word. This course develops advanced skills in using Microsoft Word to create and modify complex documents. The following concepts are covered: using bookmarks and hyphenation; creating annotations and macros; adding borders, frames, pictures, and graphics; using Microsoft Draw, WordArt and Equation Editor; creating tables and charts; formatting text into columns; sorting text; formatting with styles; creating outlines, fill-in forms, tables of contents and indexes. 2 credit hours.

BUS 122  Advanced Microsoft Excel. This course teaches advanced Microsoft Excel skills. The following concepts are covered: advanced formatting and functions; interpreting and integrating data; charting; Pivot Tables; filter capabilities; problems-solving tools; and automating tasks with macros. 3 credit hours.

BUS 140  Internship. The internship is a work experience in business and industry that develops and reinforces the students' information systems, business, and/or accounting skills. The minimum hours worked will be 160 hours. Prerequisite: Department Chair approval. 4 credit hours.

BUS 150  Business Principles. This course examines the business system and the environment in which it operates. The student is provided with a basic understanding and overview of the role of business. The types of ownership, management fundamentals, financial control, production, marketing, business law, and human resources management are examined. 3 credit hours.

BUS 162  Business Law. Introduction to law and courts; discussion of business relations and their legal aspects; cases and problems on law of contracts, personal property, sales, bailment, agencies, negotiable instruments, real and chattel mortgages. 3 credit hours.

BUS 170  Principles of Macroeconomics. This course is an introduction to the concepts and theories applicable to a national economy with a major focus on scarcity and how it impacts the welfare of a nation. Topics include gross domestic product (GDP), government spending and taxes, economic growth, unemployment and inflation, exchange rates, and monetary and fiscal policy. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR ECON 101 – Introduction to Macroeconomics (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

BUS 172  Principles of Microeconomics. This course is an introduction to specific economic units, individual markets, and individual interactions within an economy. Topics include gains from trade, opportunity cost, efficiency and markets, non-competitive markets, game theory, free trade, the response of the market to economic shock, and government intervention. Simple economic models will be used to analyze the workings of the economy. 3 credit hours.

Missouri Higher Education Core Curriculum Transfer (CORE 42) Course Number: MOTR ECON 102 – Introduction to Microeconomics (For additional information visit https://web.dhewd.mo.gov/coursetransfertracker/).

BUS 176  Marketing. This is an introductory course which deals with such aspects of marketing as retailing, wholesaling, advertising, pricing, and merchandising. The course will present a realistic and objective account of marketing. 3 credit hours.
BUS 211  Management. An introductory course on the basic concepts of organization and management with discussion on applications to operations and personnel management. 3 credit hours.

BUS 223  Advanced Microsoft Access. This course teaches the use of Microsoft Access as a relational database management system with emphasis on business applications. Students will learn to design, create, and manage Microsoft Access databases to track, report, and analyze information. 3 credit hours.

BUS 230  Business Finance. This course is a study of concepts and application of the finance function in the corporate decision-making process. Topics covered include financial statement analysis, risk, return, valuation, working capital management, cost of capital, the time value of money, and budgeting. Prerequisites: ACC 103 and BUS 150 with a grade of “C” or better. 3 credit hours.

BUS 235  Information Design and Presentation. The student learns to design, lay out, edit, and produce a publication electronically, using a personal computer, word processing and graphics software, and a desktop publishing program. In addition to desktop publishing, the student will learn the basics of a presentation software program. This course emphasizes desktop and application of information design and professional presentation for business using microcomputer software. 3 credit hours.

BUS 260  Project Management. This course covers Project Management which builds a foundation for tomorrow’s managers. Students gain understanding through project analysis, which includes both successful and failed project examples. Project management methods, tools, and software are applied to group projects. 3 credit hours.

BUS 290  Essentials of Entrepreneurship. This course provides an overview of entrepreneurship and the resources available to those considering small business opportunities. Students will be introduced to the essentials of starting a small business. 3 credit hours.

BUS 299  Special Topics in Business Administration. Special Topics in Business Administration (BUS) may include instruction on topics not covered in other BUS courses. Topics covered in other BUS courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
CIVIL ENGINEERING TECHNOLOGY
Classification of Instructional Programs – 15.0201

Associate of Applied Science Degree

The Civil Engineering Technology (CVT) program at State Technical College of Missouri prepares graduates to fill an important role in the development and rehabilitation of essential infrastructure that is relied upon daily. Civil engineering technicians work from early project development through completion of the project. They assist with projects such as roads, bridges, tunnels, ports, railways, airports, energy systems, utilities, public water supply, waste management, and solutions to environmental problems. Civil engineering technicians may also work with commercial, residential, and land development projects.

During the development stages of a project, civil engineering technicians may utilize unmanned airborne systems (UAS/drones), computer aided drafting or design (CAD) software, or geographic information systems (GIS) for mapping applications of the projects planned by the engineer. They may also estimate construction costs, specify project materials, and/or perform surveying duties during the design phase of a project.

At the construction site, civil engineering technicians assist in the construction operations by performing construction surveying, ensuring the work is performed in accordance with the project’s plans and specifications, evaluating materials quality, handling cost estimates and budgets, or scheduling work to be performed. Civil engineering technicians are on-site problem solvers and will be familiar with design and construction laws, such as Occupational Safety and Health Administration (OSHA) regulations, and contract clauses. They serve as a point of contact for these types of issues.

There are many career paths to choose from based on graduates’ skills and interests. Examples include construction inspector, surveying technician, quality control technician, project management assistant, engineering assistant, or design technician. Some civil engineering technicians advance into supervisory or administrative positions. Civil engineering technicians may choose to work for a state or local government or in the private sector at a consulting engineering firm or a construction contractor. They may work with engineers, project managers, architects, and superintendents, often in both an office and field environment simultaneously.

While the intention of the Associate of Applied Science degree is to prepare the graduate for profitable employment, it should also be noted that this degree is transferable to select four-year programs including construction management and technology management. Talk to your advisor to see what opportunities are available. Please note, this degree program is not pre-engineering and will not take the place of two years towards a Bachelor of Science in Civil Engineering. The program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE), and students also have the opportunity to earn a number of industry-recognized certifications.

Students who graduate with an Associate of Applied Science degree in Civil Engineering Technology may pursue a second Associate of Applied Science degree in Drafting and Design Engineering Technology if requirements for admittance to that program are met. The courses for the second Associate of Applied Science degree in Drafting and Design Engineering Technology will be offered in the same sequence and semester that they are being taught for the full-time Drafting and Design Engineering Technology program. The second Associate of Applied Science degree in Drafting and Design Engineering Technology may be completed in two semesters if scheduling permits.
It is a graduation requirement of the Civil Engineering Technology (CVT) program for students to earn a grade of “C” or better in all “Core Curriculum” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/civiltech/cvt/cvtfacts/

Program Mission
The mission of the Civil Engineering Technology program is to provide individuals with opportunities for educational experiences that enable them to develop the skills necessary for employment in the civil engineering technology industry.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Analytical problem solving and critical thinking skills necessary for employment in the civil engineering technology industry.
- Oral and written communication skills that will enhance their ability to secure and maintain meaningful employment in the civil engineering technology industry.
- A professional attitude as well as leadership and management skills through in-class team projects and campus affiliated organizations.
- Skills required to earn industry specific certifications.
- Knowledge of the industry.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>CVT 115</td>
<td>Safety and Materials Testing</td>
<td>6</td>
</tr>
<tr>
<td>CVT 120</td>
<td>Engineering Documents</td>
<td>3</td>
</tr>
<tr>
<td>CVT 140</td>
<td>Applied Mathematics with Trigonometry</td>
<td>5</td>
</tr>
<tr>
<td>CVT 145</td>
<td>Mapping with Drones</td>
<td>3</td>
</tr>
<tr>
<td>CVT 225</td>
<td>Construction Estimating</td>
<td>5</td>
</tr>
<tr>
<td>CVT 230</td>
<td>Environmental Issues</td>
<td>3</td>
</tr>
<tr>
<td>CVT 235</td>
<td>Surveying for Technicians</td>
<td>3</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVT 240</td>
<td>Surveying I</td>
<td>3</td>
</tr>
<tr>
<td>CVT 245</td>
<td>Introduction to Geographic Information Systems</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(GIS) &amp; Global Navigation Satellite Systems (GNSS)</td>
<td></td>
</tr>
<tr>
<td>CVT 246</td>
<td>Statics</td>
<td>5</td>
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<td>CVT 247</td>
<td>Strength of Materials</td>
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<td>CVT 250</td>
<td>Construction Management</td>
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<td>Optional:</td>
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<tr>
<td>CVT 200</td>
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GENERAL EDUCATION REQUIREMENTS

General Education Requirements
(see page 42-43)
May Not Include:

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<tr>
<td>ASC 104</td>
<td>Human Anatomy and Physiology with Lab I</td>
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</tr>
<tr>
<td>ASC 106</td>
<td>Human Anatomy and Physiology with Lab II</td>
<td>4</td>
</tr>
<tr>
<td>NST 101</td>
<td>Network Fundamentals</td>
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PROGRAM REQUIREMENTS

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<td>DDT 111</td>
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<tr>
<td>DDT 183</td>
<td>Fundamentals of Computer Aided Drafting (CAD)</td>
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**GRADUATION REQUIREMENTS**

<table>
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<tr>
<th>Course Code</th>
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<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 1

It is a graduation requirement of the Civil Engineering Technology (CVT) program for students to earn a grade of “C” or better in all “Core Curriculum” courses.

**PROGRAM TOTAL** 70-76

**CVT 115 Safety and Materials Testing.** This course introduces the basic properties of construction materials. Students learn to test and inspect soil, aggregate, concrete, and asphalt in laboratory and field situations. Tests are performed in accordance with industry standards including American Association of State Highway and Transportation Officials (AASHTO), American Society for Testing and Materials (ASTM), Missouri Department of Transportation (MoDOT), and other standards. Students will also review existing occupational safety and health standards and codes as they relate to the construction industry, and the practices utilized to comply with these regulations. Laboratory record keeping and reporting are introduced. 6 credit hours.

**CVT 120 Engineering Documents.** This course focuses on understanding the project plans and specifications used in civil engineering technology. 3 credit hours.

**CVT 140 Applied Mathematics with Trigonometry.** This course focuses on practical mathematical computations required for various construction and civil engineering technology applications. Areas, volumes, conversions, scaling and measurement of materials, and right- and oblique- triangle trigonometry are emphasized. Prerequisite: MAT 051 with a grade of “C” or better. 5 credit hours.

**CVT 145 Mapping with Drones.** This course introduces the basics of unmanned aircraft systems (UAS), sometimes called drones, and land mapping systems. Students will gain hands-on practical experience flying small drones, with an emphasis on planning and processing imagery acquired with the drones. Specialized mapping software will be used to provide a broad range of 3D mapping and classification applications. 3 credit hours.

**CVT 200 Internship.** A planned work experience in an industry or business directly related to the program of study. The student will be employed directly by an industry or business. Both parties will submit reports and evaluations of experiences to the Department Chair. 6 credit hours.

**CVT 225 Construction Estimating.** This course teaches the estimating process including estimate development, bidding procedures, and analyzing plans to perform quantity takeoffs and unit pricing. 5 credit hours.

**CVT 230 Environmental Issues.** This course teaches environmental issues relating to the civil construction industry. Topics include environmental laws, regulations, and practices. Water and wastewater treatment systems are also covered. 3 credit hours.

**CVT 235 Surveying for Technicians.** This course teaches basic surveying skills including computations and operation of equipment as needed for employment as an entry-level survey technician. Prerequisite: CVT 140 with a grade of “C” or better. 3 credit hours.

**CVT 240 Surveying I.** This course teaches basic surveying principles, mathematics, and operations with emphasis on basic computations and operation of equipment including the surveyor’s tape, level, and total station. This course has a laboratory component where the student learns basic instrument use and elementary surveying operations through a variety of field exercises. Prerequisite: CVT 140 with a grade of “C” or better. 3 credit hours.
CVT 241  Surveying II.  This course teaches the theory and practice of traverse computations. Topics that are introduced include mathematics and concepts used in route surveying; elementary concepts of property boundary surveying, topographic mapping, and volume calculations; and construction surveying. Elementary concepts of Geographic Information Systems (GIS) and Global Positioning Systems (GPS) are also introduced. This course has a laboratory component where the student builds on the instrument use and surveying operations learned in Surveying I. Prerequisite: CVT 240 with a grade of “C” or better.  3 credit hours.

CVT 242  Land Records: Researching and Rules of Construction.  This course teaches the fundamental knowledge required to perform land records research with deeds and other related records, survey records, and other land records preparatory to conducting property boundary surveys. The student will examine evidence of ownership, historical information, property descriptions, and legal requirements for reviewing and recording documents. Applications of the applicable portions of the Missouri (and other state) Minimum Standards for Property Boundary Surveys as well as of the standards for land title surveys of the American Land Title Association (ALTA)/National Society of Professional Surveyors (NSPS) will be discussed. Various aspects of professional practice and ethics are also included. Prerequisite: CVT 241 with a grade of “C” or better.  3 credit hours.

CVT 243  Legal Aspects of Boundary Surveying.  This course teaches the legal principles of surveying including topics in boundaries, property law as applied to surveying, monumentation, deed interpretation, and professional liability and ethics. Also discussed are various principles of Missouri survey law, regulations such as the Missouri (and other state) Minimum Standards for Property Boundary Surveys, and the applicable portions of the standards for land title surveys of the American Land Title Association (ALTA)/National Society of Professional Surveyors (NSPS). Prerequisite: CVT 241 with a grade of “C” or better.  3 credit hours.

CVT 245  Introduction to Geographic Information Systems (GIS) & Global Navigation Satellite Systems (GNSS). This course teaches fundamental concepts in the use of GIS and GNSS to prepare students for work in the geospatial industries and professions. Students learn spatial referencing concepts, GIS, and GNSS and also introduced to GIS/GNSS receivers and GIS/GNSS software systems that are used to collect, correct, map, and analyze geospatial data. Prerequisite: CVT 235 or CVT 240 with a grade of “C” or better.  3 credit hours.

CVT 246  Statics.  Selected topics from trigonometry, force vectors, components, moments of forces, equilibrium, and parallel force systems, concurrent and non-concurrent force systems both coplanar and non-coplanar are covered. Stress in trusses by method of joints, sections, and pins will be analyzed. Prerequisites: MAT 121 or CVT 140 and MAT 071 with a grade of “C” or better.  5 credit hours.

CVT 247  Strength of Materials.  Topics covered include calculation of stress and deformation caused by tension, compression, shear, temperature, torsion, bending and buckling loads. Results of these calculations are used to select appropriate structural members to support designated loads. Prerequisite: CVT 246.  5 credit hours.

CVT 250  Construction Management.  This course presents the various project delivery systems that are used for construction projects, documentation requirements, and critical path scheduling.  3 credit hours.

CVT 255  Advanced Geographic Information Systems (GIS) & Global Navigation Satellite Systems (GNSS). This course teaches and demonstrates advanced spatial referencing concepts in Geographic Information Systems (GIS) and the Global Navigation Satellite Systems (GNSS). Students will be introduced to advanced GIS/GNSS receivers and GIS/GNSS software systems that are used to collect, correct, map, and analyze geospatial data. Prerequisite: CVT 245 with a grade of “C” or better.  3 credit hours.

CVT 260  Introduction to Blasting Technology.  This course teaches surface blasting principles related to open pit quarrying/mining and general construction using accepted industry empirical methods and computations. These general principles will assist the student with gaining knowledge needed for employment as an entry-level blaster and preparation for the State of Missouri licensing exam. Prerequisites: CVT 140 with a grade of “C” or better and CPP 101 with a grade of “C” or better.  3 credit hours.

CVT 261  Introduction to Drilling Technology.  This course teaches basic drilling principles for blasting in the crushed stone construction industry. Students will also learn basic equipment use and elementary operations. Prerequisite: CVT 260 with a grade of “C” or better.  3 credit hours.
CVT 299 Special Topics in Civil Engineering Technology. Special Topics in Civil Engineering Technology (CVT) may include instruction on topics not covered in other CVT courses. Topics covered in other CVT courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
The Commercial Turf & Grounds Management program is designed to prepare students to enter careers as specialist and supervisors in turf and landscape management. Graduates may find employment in maintaining golf courses, athletic turf, parks, and recreational facilities as well as grounds of large commercial buildings, malls, and college campuses. The program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

The program contributes to the green industry by emphasizing the responsible use of products and appropriate plant selection to maximize the environmental benefits of healthy lawns and landscapes.

The Commercial Turf & Grounds Management program is unique in that some courses are delivered in eight-week blocks so students finish their first and second years in early March. Graduates and interns are available to industry in early March when employers in this industry are actively looking for qualified personnel.

The curriculum is rigorous, fast-paced, and designed to emphasize problem solving skills and critical thinking. The program is both physically and mentally challenging. Classes are small so students receive individualized attention and hands-on education. Students will complete core general education courses and earn Missouri Category 3 Pesticide Applicator’s License.

Students may also choose to pursue a one-year certificate in the technical areas of Turfgrass Management and/or Landscape Management. Commercial Turf & Grounds Management certificate students receive education in related turf and landscape fields; equipment operations and maintenance; applied math; pest, weed, and disease control; and communications.

To view program outcome data, visit https://www.statetechmo.edu/programs/civiltech/ctg/ctgfacts/.

Program Mission
The mission of the Commercial Turf & Grounds Management program is to provide the diverse commercial turf and grounds industries of Missouri and beyond with skillful and knowledgeable employees who possess the ability to quickly advance and become members of the leadership team while earning profitable compensation.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Knowledge and skills necessary to succeed in the commercial turf and grounds management industry.
- Attitudes to assure an appreciation of the dignity of work and the satisfaction of a job well done.
- Knowledge and/or credentials necessary to obtain certain state and professional licensures and/or certifications.
- Analytic problem solving and critical thinking skills.
### CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTG 106</td>
<td>Fundamentals of Turf and Grounds</td>
<td>3</td>
</tr>
<tr>
<td>CTG 107</td>
<td>Turfgrass Management I</td>
<td>3</td>
</tr>
<tr>
<td>CTG 109</td>
<td>Equipment Operations and Maintenance</td>
<td>3</td>
</tr>
<tr>
<td>CTG 116</td>
<td>Plant Propagation</td>
<td>3</td>
</tr>
<tr>
<td>CTG 117</td>
<td>Commercial Site Contracting</td>
<td>3</td>
</tr>
<tr>
<td>CTG 122</td>
<td>Internship I</td>
<td>2</td>
</tr>
<tr>
<td>CTG 126</td>
<td>Internship II</td>
<td>3-6</td>
</tr>
<tr>
<td>CTG 201</td>
<td>Weeds and Diseases</td>
<td>3</td>
</tr>
<tr>
<td>CTG 204</td>
<td>Insects and Pests</td>
<td>3</td>
</tr>
<tr>
<td>CTG 206</td>
<td>Irrigation &amp; Drainage</td>
<td>3</td>
</tr>
<tr>
<td>CTG 207</td>
<td>Turfgrass Management II</td>
<td>3</td>
</tr>
<tr>
<td>CTG 212</td>
<td>Landscape Maintenance &amp; Installation</td>
<td>1</td>
</tr>
<tr>
<td>CTG 215</td>
<td>Landscape Design</td>
<td>3</td>
</tr>
<tr>
<td>CTG 216</td>
<td>Woody Plant Identification</td>
<td>3</td>
</tr>
<tr>
<td>CTG 217</td>
<td>Herbaceous Plant Identification</td>
<td>3</td>
</tr>
<tr>
<td>CTG 220</td>
<td>Basic Shop for Horticulture</td>
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### GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see page 42-43)

Must Include:

- PHY 103/104 Environmental Science 4

OR

A science course with lab approved by CTG department chair. 4

May Not Include:

- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

### PROGRAM REQUIREMENTS

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CTG 105</td>
<td>Missouri Pesticide Application</td>
<td>1</td>
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<tr>
<td>AGR 100</td>
<td>Introduction to Agribusiness Systems</td>
<td>3</td>
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### GRADUATION REQUIREMENTS

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<th>Course</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>SEM 110</td>
<td>Spanish Language and Hispanic Culture</td>
<td>NC</td>
</tr>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
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<tr>
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<td><strong>SUB-TOTAL</strong></td>
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</tbody>
</table>

It is a graduation requirement of the Commercial Turf & Grounds Management (CTG) program for students to earn CPR and First Aid certification.

**PROGRAM TOTAL 71**

90
# COMMERCIAL TURF & GROUNDS MANAGEMENT

Classification of Instructional Programs – 01.0607

Turfgrass Management and/or Landscape Management One-Year Certificate

## CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tr>
<td>CTG 105</td>
<td>Missouri Pesticide Application</td>
<td>1</td>
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<tr>
<td>CTG 106</td>
<td>Fundamentals of Turf and Grounds</td>
<td>3</td>
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<td>CTG 109</td>
<td>Equipment Operations and Maintenance</td>
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<tr>
<td>CTG 117</td>
<td>Commercial Site Contracting</td>
<td>3</td>
</tr>
<tr>
<td>CTG 201</td>
<td>Weeds and Diseases</td>
<td>3</td>
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<tr>
<td>CTG 204</td>
<td>Insects and Pests</td>
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## GENERAL EDUCATION REQUIREMENTS

General Education Requirements
(see page 42-43)
Must Include:
- Three credit hours from Area 1. Oral & Written Communication 3
- Three credit hours from Area 5. Technical Literacy 3

May Not Include:
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 6

## PROGRAM REQUIREMENTS

### Turfgrass Management Certificate

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CTG 107</td>
<td>Turfgrass Management I</td>
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</tr>
<tr>
<td>CTG 206</td>
<td>Irrigation &amp; Drainage</td>
<td>3</td>
</tr>
<tr>
<td>CTG 207</td>
<td>Turfgrass Management II</td>
<td>3</td>
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<tr>
<td>PHY 103</td>
<td>Environmental Science</td>
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<td>PHY 104</td>
<td>Environmental Science Lab</td>
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### Landscape Management Certificate

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<tbody>
<tr>
<td>CTG 212</td>
<td>Landscape Maintenance &amp; Installation</td>
<td>1</td>
</tr>
<tr>
<td>CTG 215</td>
<td>Landscape Design</td>
<td>3</td>
</tr>
<tr>
<td>CTG 216</td>
<td>Woody Plant Identification</td>
<td>3</td>
</tr>
<tr>
<td>CTG 217</td>
<td>Herbaceous Plant Identification</td>
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## GRADUATION REQUIREMENTS

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<tr>
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<td>Spanish Language and Hispanic Culture</td>
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<td>Job Search Strategies</td>
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**PROGRAM TOTAL** 33-36

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**CTG 105 Missouri Pesticide Application.** A course designed to guide students in pursuit of the Missouri Category 3 Pesticide Applicator’s License. This license is only available through the Missouri Department of Agriculture. 1 credit hour.
CTG 106  **Fundamentals of Turf and Grounds.** A course designed to introduce students to fundamental terminology, theories, principles and practices that are a necessity for any person pursuing a career in specialized professions of turf and grounds. 3 credit hours.

CTG 107  **Turfgrass Management I.** A course designed to introduce students to turfgrasses common to Missouri and the transition zone. Emphasis will be placed upon turfgrass structures as a means of identification as well as turfgrass characteristics and their usage. 3 credit hours.

CTG 109  **Equipment Operations and Maintenance.** A course emphasizing principles of machinery operation and maintenance common in the turf and grounds industry. Emphasis will be placed upon proper adjustment, calibration, repair and safety. 3 credit hours.

CTG 116  **Plant Propagation.** A course containing the fundamental principles involved in plant propagation, both sexual and asexual. Students will learn many useful techniques of propagating plants. 3 credit hours.

CTG 117  **Commercial Site Contracting.** An applied mathematics course designed to teach skills utilized on a daily basis by professional turf and grounds technicians. Emphasis will be placed upon business math, bidding, and related fundamental math skills. 3 credit hours.

CTG 122  **Internship I.** In this course students will research potential internship training sites. Students will secure employment, enter into an internship agreement, and complete required internship forms. Prerequisite: Department Chair approval. 2 credit hours.

CTG 126  **Internship II.** This course is a field-based learning experience that combines study, observation, and supervised occupational/employment with an agricultural business, organization, or government agency in the commercial turf and grounds industry. Students will use this opportunity to apply horticultural, leadership, communications and business theories learned in a practical context. The student intern, internship supervisor, and college coordinator develop an individual internship plan. Students must complete this course requirement by taking and passing either one-six credit hour course or two-three credit hour courses. Prerequisite: CTG 122 with a passing grade. 3 to 6 credit hours.

CTG 201  **Weeds and Diseases.** A course designed to introduce students to common weeds and diseases of ornamentals and turfgrasses. Identification and control are emphasized. 3 credit hours.

CTG 204  **Insects and Pests.** Emphasis on identification of insects and other pests on ornamentals and turfgrasses. Control of insects will be discussed using Integrated Pest Management and pesticides. 3 credit hours.

CTG 206  **Irrigation and Drainage.** A course designed to introduce students to landscape and golf course irrigation systems, their design and installation as well as drainage. Special emphasis will be placed upon irrigation hydraulics and irrigation efficiency. 3 credit hours.

CTG 207  **Turfgrass Management II.** Designed to provide advanced establishment skills in the maintenance of turf areas pertaining to golf courses, athletic fields, parks, and sod producers. Includes golf course design, athletic field maintenance, fertilization, and mowing. Provides information for turf and grounds professionals in the maintenance and improvement of turfgrass playing areas. Methods of improving management practices, interpersonal skills, as well as leadership skills will be stressed. Prerequisite: CTG 107 with a grade of “C” or better. 3 credit hours.

CTG 212  **Landscape Maintenance & Installation.** This course teaches the principles of installation and maintenance common in the landscape industry. Emphasis is placed on identification and analysis of plant care needs. 1 credit hour.

CTG 215  **Landscape Design.** A study of the principles of landscape design including an appreciation of various artistic and design theories. Emphasis is placed on practical application as well as installation limitations and practices. Designs are drafted using computer software. 3 credit hours.
CTG 216  Woody Plant Identification.  A study in identification of deciduous and evergreen trees and shrubs that are commonly utilized in the landscape industry. Techniques in maintenance of ornamentals will be presented emphasizing function in the landscape. Methods of pruning trees and shrubs will also be demonstrated as well as ornamental attributes, cultural requirements and adaptability in urban and suburban environments.  3 credit hours.

CTG 217  Herbaceous Plant Identification.  A study in the identification of herbaceous plants, their selection, use and maintenance in landscaping. Emphasis will be given to culture, function and individual characteristics.  3 credit hours.

CTG 220  Basic Shop for Horticulture.  A course designed to provide students with a general knowledge of basic shop principles and practices that are common in the commercial turf and grounds industry. Students will learn how to select and utilize various tools and equipment commonly found in the shop. Basic welding and grinding techniques will be emphasized and students will be exposed to small engine maintenance and basic hydraulics. Shop safety will be emphasized in every phase of this course.  2 credit hours.

CTG 225  Reel and Rotary Technology.  This course includes instruction on the safety precautions and knowledge required for students to properly sharpen and maintain rotary and reel mowing equipment. Emphasis will be placed on sharpening, maintenance, adjustment, and setting proper height of cut.  2 credit hours.

CTG 299  Special Topics in Commercial Turf & Grounds Management.  Special Topics in Commercial Turf & Grounds Management (CTG) may include instruction on topics not covered in other CTG courses. Topics covered in other CTG courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits.  1-4 credit hours.
COMPUTER APPLICATION DEVELOPMENT

Classification of Instructional Programs –11.0201

Associate of Applied Science Degree

Graduates of this program are taught the technical competencies required to be productive in an entry-level programming or web developer position using multiple programming languages. The program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

Students get a solid foundation in programming, web development, website design, application development, database systems, and system analysis and design and are exposed to many business-related languages, networking concepts, and troubleshooting.

Students also develop their skills in internship experiences. Classes are small and held in well-equipped computer labs supervised by qualified instructors. Individualized attention, focus on theory, and hands-on experience characterize the Computer Application Development Department at State Technical College of Missouri.

It is a graduation requirement of the Computer Application Development (CPP) program for students to earn a grade of “C” or better in all “Core Curriculum” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/computertech/cad/cadfacts/.

Program Mission
The mission of the Computer Application Development program is to offer a highly specialized, advanced technical education and develop the interpersonal skills necessary for a challenging career as an information technology professional. Oral and written communications are included in both technical and general education courses.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Oral and written communication skills.
- Analytical approaches to problem solving.
- Knowledge and skills in programming in C#, JAVA, COBOL, and HTML.
- Knowledge and skills in database management.
- Knowledge and skills in web design, HTML, CSS, and Java Script.
- Knowledge and skills in mobile application development.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPP 116</td>
<td>Graphic Design 3</td>
</tr>
<tr>
<td>CPP 125</td>
<td>COBOL Programming Language 3</td>
</tr>
<tr>
<td>CPP 140</td>
<td>Internship I 4</td>
</tr>
<tr>
<td>CPP 215</td>
<td>Java Programming 3</td>
</tr>
<tr>
<td>CPP 217</td>
<td>Mobile Applications 3</td>
</tr>
<tr>
<td>CPP 218</td>
<td>Internet Programming II 3</td>
</tr>
<tr>
<td>CPP 219</td>
<td>Apple Mobile Applications 3</td>
</tr>
<tr>
<td>CPP 222</td>
<td>Database Systems Management and Design 3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>CPP 223</td>
<td>Advanced Database Systems Management and Design</td>
</tr>
<tr>
<td>CPP 237</td>
<td>Internet Programming</td>
</tr>
<tr>
<td>CPP 245</td>
<td>C# Programming</td>
</tr>
<tr>
<td>CPP 270</td>
<td>Advanced Application Concepts</td>
</tr>
<tr>
<td>CPP 280</td>
<td>Application Security and Implementation</td>
</tr>
<tr>
<td>OR CPP 141</td>
<td>Internship II</td>
</tr>
<tr>
<td></td>
<td><strong>SUB-TOTAL</strong></td>
</tr>
</tbody>
</table>

**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements (see page 42-43)

Must Include:

- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

**PROGRAM REQUIREMENTS**

<table>
<thead>
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<tr>
<td>BUS 150</td>
<td>Business Principles</td>
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</tr>
<tr>
<td>BUS 260</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>COM 102</td>
<td>English Composition II: Writing the Research Paper</td>
<td>3</td>
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**SUB-TOTAL** 9

**GRADUATION REQUIREMENTS**

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<thead>
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<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 1

It is a graduation requirement of the Computer Application Development (CPP) program for students to earn a grade of “C” or better in all “Core Curriculum” courses.

**PROGRAM TOTAL** 69-70

**CPP 101** *Introduction to Microcomputer Usage.* An introductory course in the fundamentals of using computer applications. 3 credit hours.

**CPP 102** *Advanced Microcomputer Usage.* This course emphasizes advanced features of word processing, database, spreadsheet and presentation software as well as a review of the operating system. The focus is on comprehensive projects that include using advanced word processing features, developing database design and management skills, creating spreadsheet models and macros, designing and creating multi-media presentations, and creating advanced projects that integrate computer applications. 3 credit hours.

**CPP 104** *Microsoft Access.* This course introduces Microsoft’s Access database management system. Topics include creating a database, using forms to enter and modify data, and displaying information using reports and queries. 1 credit hour.

**CPP 112** *Computer Concepts.* Survey of electronic data processing equipment and applications. Course will include historical background, data representation, storage media, programming concepts, procedures, and controls with student access to microprocessors. 3 credit hours.

**CPP 116** *Graphic Design.* This course offers an introduction to the principles of visual communication for both print and online publications. Utilizing the computer, students will explore graphic design concepts through the study of color, form, typography, and composition as well as practice integrating language and communicating ideas through text and imagery. 3 credit hours.
CPP 120  **Introduction to Computer Programming.**  Study of programming logic and introduction to code structures like loops, conditional statements and modules. Class also demonstrates popular programming languages. 2 credit hours.

 CPP 122  **Visual Basic Programming.**  An intermediate programming course utilizing Visual Basic to illustrate fourth-generation languages. Students gain experience in programming Windows-style interfaces and writing object-oriented code. 3 credit hours.

 CPP 125  **COBOL Programming Language.**  A computer problem solving and programming course using COBOL as a vehicle language. The course covers writing programs involving computations, moving data, designing and debugging programs, sorting, selection control and data validation. This course is a combination of lecture and lab. 3 credit hours.

 CPP 126  **RPG Programming Language.**  An advanced course in RPG/400 programming, the course covers creating, updating and processing physical files for the purpose of programming complicated reports. Iteration, selection and complex mathematical computations are also covered. 3 credit hours.

 CPP 127  **Lotus Notes.**  This course covers the set-up, maintenance, and troubleshooting of a variety of collaborative applications in a Lotus Notes environment. 3 credit hours.

 CPP 133  **Operating Platforms.**  This course presents elements of DOS, Windows, UNIX and the AS/400 operating systems. Students explore the similarities and differences of these operating systems in a hands-on environment. 3 credit hours.

 CPP 140  **Internship I.**  The internship is a work experience in business and industry that develops and reinforces the students computer skills. The minimum hours worked will be 280 hours. Prerequisite: Department Chair approval. 4 credit hours.

 CPP 141  **Internship II.**  This internship is optional. This will be a work experience in business and industry that develops and reinforces the students computer skills. The minimum hours worked will be 280 hours. This course requires the permission of the department. Prerequisites: CPP 140 and Department Chair approval. 4 credit hours.

 CPP 212  **Visual Basic Programming II.**  This is an advanced programming course utilizing Visual Basic. Students build on their experience by programming Windows-style interfaces and writing object-oriented code. Prerequisite: CPP 122. 3 credit hours.

 CPP 215  **Java Programming.**  This course is an introduction to Java programming which involves designing, writing and debugging Java programs. 3 credit hours.

 CPP 217  **Mobile Applications.**  This course is an introduction to designing mobile applications for use on devices such as smart phones. Students will gain experience creating, revising, and testing mobile applications. 3 credit hours.

 CPP 218  **Internet Programming II.**  This is an advanced course using the languages of the Internet, which includes HTML, Java, CGI and other advances. Students will gain experience in web site management. Prerequisite: CPP 237. 3 credit hours.

 CPP 219  **Apple Mobile Applications.**  This course is an introduction to designing mobile applications for the Apple operating system. Students will create, revise, and test mobile applications. 3 credit hours.

 CPP 222  **Database Systems Management and Design.**  Study of database concepts and structures, design of database systems, and data management are covered in this course. Students utilize SQL and an AS/400 system as well as a PC-based database management system to apply concepts learned in lecture. 3 credit hours.

 CPP 223  **Advanced Database Systems Management and Design.**  This course covers the use of Structured Query Language (SQL) or Microsoft Access as relational database management systems. Prerequisite: CPP 222. 3 credit hours.
CPP 225 Control Language Programming. This course develops the ability to code, debug and execute control language (CL) programs utilizing the basic features of the language. Topics include the role of control language in relation to other languages, input and output in CL, and testing and debugging CL programs. 4 credit hours.

CPP 230 C++ Programming Language I. An introduction to programming in C++, topics covered include objects, methods, hierarchy, functions, format strings, identifiers, control and conditional statements, various operators, types, arrays, pointers and strings. 3 credit hours.

CPP 231 Advanced COBOL Programming Language. This course is a continuation in the study of COBOL. Emphasis is placed on advanced table processing, file maintenance and interactive programming. Prerequisite: CPP 125. 3 credit hours.

CPP 232 GIS Database Systems. An introduction to Geographic Information Systems (GIS) database management and design. This course is a combination of lecture and lab. Prerequisites: CPP 222 and CPP 223. 3 credit hours.

CPP 237 Internet Programming. An introduction to the programming languages of the Internet, languages covered are HTML, CGI, and Java. Topics include creation of Internet homepages, site management, creation of applets, handling forms and Internet security. 3 credit hours.

CPP 239 Perl Programming. This course covers a thorough introduction to the Perl Programming language. It includes development and maintenance of portable scripts useful for system management, data manipulation, and WEB CGI programming. 3 credit hours.

CPP 240 C++ Programming Language II. An advanced course in computer programming using the C++ language for implementation. This course covers the following areas: Data files, arrays, sets linked lists, trees, queues and stacks. Difference search-and-sort algorithms will also be discussed. This course is a combination of lecture and lab. Prerequisite: CPP 230. 3 credit hours.

CPP 245 C# Programming. This course offers an introduction to C# Programming which includes problem solving and programming. C# involves designing, writing, and debugging programs. 3 credit hours.

CPP 250 CL Programming - AS400. This course will prepare students with a basic understanding of Control Language Programming, message handling and debugging techniques. Students will also be introduced to advanced CL programming techniques such as OPNQRYF creating their own commands and applying contextual help to their commands. 3 credit hours.

CPP 270 Advanced Application Concepts. This course teaches advanced topics of object-oriented programming languages including: coding classes, inheritance, polymorphism, exception handling, and advanced graphical user interface (GUI). Students will also explore methods used to publish, implement, and maintain applications as well as compare and contrast various aspects of security and testing. 3 credit hours.

CPP 280 Application Security and Implementation. This course teaches students the methods to write, maintain, and implement secure computer applications. Prerequisite: CPP 245. 3 credit hours.

CPP 299 Special Topics in Computer Application Development. Special Topics in Computer Application Development (CPP) may include instruction on topics not covered in other CPP courses. Topics covered in other CPP courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
DENTAL ASSISTING TECHNOLOGY
Classification of Instructional Programs – 51.0601
One-Year Certificate

Accredited By
Commission on Dental Accreditation

Dental assistants are specially-trained, technically-skilled members of the dental team. Students are trained in the steps required for a variety of dental procedures and become proficient in preparing and transferring dental instruments and materials throughout those procedures. Students will learn to take x-rays, polish teeth, apply dental sealants, take impressions, and provide oral health instructions.

In addition to basic chairside dental assisting, Missouri law provides advancement opportunities for dental assistants licensed in performing expanded functions. The State Technical College of Missouri Dental Assisting Technology program includes Expanded Function Dental Assisting (EFDA) licensing courses and examinations. Graduates of the program are eligible to receive EFDA certificates/licenses to provide specialized patient care.

The Dental Assisting Technology program is accredited by the Commission on Dental Accreditation of the American Dental Association, 211 East Chicago Avenue, Chicago, IL 60611-2678; 312-440-2500; www.ada.org.

The Dental Assisting Technology program is an eleven-month program with general education courses taken the prior summer semester. This certificate program includes 1,166 total instructional hours including a minimum of 300 clock hours of clinical study in which students will participate at approved clinical sites. To be successful, students need effective communication skills and a solid background in science and math.

Upon successful completion of the program, Dental Assisting Technology students will be state certified in Assisting in the Administration of and Monitoring Nitrous Oxide-Oxygen Anesthesia and eligible to sit for the Dental Assisting National Board (DANB) examination to earn the designation of Certified Dental Assistant (CDA).

Enrollment in the Dental Assisting Technology program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions or https://www.statetechmo.edu/dat/ for the specific application requirements, forms, and deadline.

Students who are admitted to the Dental Assisting Technology program should be aware that they will be subject to drug screening. Persons who have been convicted or pled guilty to certain felony offenses may be ineligible for placement in required clinical externships, to sit for the DANB examination, or hold any direct patient care positions.

To remain enrolled in the Dental Assisting Technology program students are required to earn a grade of 75% or better in every Dental Assisting Technology course. It is a graduation requirement of the Dental Assisting Technology (DAT) program for students to earn a grade of 75% or better in all “Core Curriculum” courses and a grade of “C” or better in all “General Education Requirements” and “Graduation Requirements” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/healthsci/dat/datfacts/.

Program Mission
The mission of the Dental Assisting Technology program is to educate students to become knowledgeable and clinically proficient dental assistants who can assist the dentist in providing optimum patient care.
Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Clinical proficiency in the performance of direct patient care.
- The knowledge and fundamental skills required to qualify for Expanded Function Dental Assistant certificates/licenses in Missouri.
- Analytical and problem solving skills to pass the Dental Assisting National Board examination and earn the designation of “Certified Dental Assistant”.
- Desirable chairside assisting skills for job placement.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>DAT 100</td>
<td>Infection Control</td>
<td>2</td>
</tr>
<tr>
<td>DAT 111</td>
<td>Dental Science and Health I</td>
<td>3</td>
</tr>
<tr>
<td>DAT 112</td>
<td>Dental Science and Health II</td>
<td>1</td>
</tr>
<tr>
<td>DAT 122</td>
<td>Chairside Assisting I</td>
<td>4</td>
</tr>
<tr>
<td>DAT 131</td>
<td>Dental Materials I</td>
<td>5</td>
</tr>
<tr>
<td>DAT 141</td>
<td>Dental Radiology I</td>
<td>4</td>
</tr>
<tr>
<td>DAT 151</td>
<td>Clinical Externship I</td>
<td>2</td>
</tr>
<tr>
<td>DAT 161</td>
<td>Chairside Assisting II</td>
<td>5</td>
</tr>
<tr>
<td>DAT 171</td>
<td>Dental Materials II</td>
<td>2</td>
</tr>
<tr>
<td>DAT 182</td>
<td>Dental Radiology II</td>
<td>3</td>
</tr>
<tr>
<td>DAT 190</td>
<td>Dental Office Procedures</td>
<td>2</td>
</tr>
<tr>
<td>DAT 191</td>
<td>Clinical Externship II</td>
<td>4</td>
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</table>

SUB-TOTAL 37

GENERAL EDUCATION REQUIREMENTS

General Education Requirements 6
(see page 42-43)
Must Include:
Six credit hours from Area 1, Oral & Written Communication 6

SUB-TOTAL 6

PROGRAM REQUIREMENTS

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<tr>
<td>SEM 101</td>
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<tr>
<td>SEM 102</td>
<td>Clinical Practice Seminar II</td>
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SUB-TOTAL 0

GRADUATION REQUIREMENTS

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<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
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</table>

SUB-TOTAL 1

It is a graduation requirement of the Dental Assisting Technology (DAT) program for students to earn a grade of 75% or better in all “Core Curriculum” courses and a grade of “C” or better in all “General Education Requirements” and “Graduation Requirements” courses.

PROGRAM TOTAL 44
DAT 100  **Infection Control.** In this course, students will study microorganisms and diseases of concern in dentistry. Emphasis will be placed on modes of disease transmission, practicing aseptic techniques, and methods for preventing disease transmission through personal protection, disinfection, and sterilization. Focus will be on Occupational Safety and Health Administration (OSHA) standards, Center for Disease Control (CDC) and American Dental Association (ADA) recommendations, and Environmental Protection Agency (EPA) guidelines. This course will prepare students for the Dental Assisting National Board Infection Control Examination (DANBICE). 2 credit hours.

DAT 111  **Dental Science and Health I.** This course is an in-depth study of dental anatomy and morphology. It includes basic sciences related to the practice of dentistry. Dental assistants must be knowledgeable in these sciences in order to understand why dental procedures require specific and detailed protocols for compliance with a standard of care for best practices. 3 credit hours.

DAT 112  **Dental Science and Health II.** In this course, students will identify bones of the skull and also nerves and blood vessels that supply the teeth and oral cavity. Students will learn the names and locations of muscles of facial expression and mastication. This course also includes the study of nutrition for dental and whole body health. Material learned will serve as a foundation for the practice of dental assisting. Prerequisites: DAT 100, DAT 111, DAT 122, DAT 131, DAT 141, and DAT 151 with a grade of 75% or better. 1 credit hour.

DAT 122  **Chairside Assisting I.** This course teaches the hands-on daily activities the chairside assistant performs to be an effective member of the dental health team. The manipulation and care of dental instruments and equipment, and their relationships to dental operative procedures are emphasized. The study of theory and development of preclinical and clinical skills prepare students for their extramural clinical practicum. Lectures include instruction on how to care for patients with special needs, office emergencies, and first aid. Two-year certification through the American Red Cross or American Heart Association in cardiopulmonary resuscitation (CPR) is a requirement prior to patient contact. 4 credit hours.

DAT 131  **Dental Materials I.** This course teaches students the properties and manipulation of materials used in the process of delivering dental care to patients. Students will learn to apply critical thinking in the selection and preparation of dental materials as well as the proper clinical techniques required in working with these substances. Lab skills are taught and evaluated to clinical proficiency. Skills that cannot be taught to clinical proficiency will be taught and evaluated to preclinical or lab proficiency. 5 credit hours.

DAT 141  **Dental Radiology I.** In this course, students will be taught theories and how to apply techniques in dental radiography and digital imaging. Students will develop competencies using bisecting and paralleling techniques with dental film, x-ray sensors, and phosphor plates. Emphasis is placed on interpretation of radiographic findings to determine if a radiograph is of diagnostic value. This course also prepares students for the Dental Assisting National Board Radiation Health and Safety Examination. 4 credit hours.

DAT 151  **Clinical Externship I.** This course consists of approximately sixteen hours of clinical practicum per week in participating dental facilities. In conjunction with Clinical Externship II, students rotate through three general dental practices and observe two specialty practices for a minimum of 300 clinical hours. 2 credit hours.

DAT 161  **Chairside Assisting II.** This course teaches the American Dental Association (ADA) recognized dental specialties including Orthodontics and Dentofacial Orthopedics, Pediatric Dentistry, Endodontics, Oral and Maxillofacial Surgery, Periodontics, and Prosthodontics. This course will also include direct restorative procedures, sizing and cementing stainless steel crowns, and palliative care for minor dental emergencies. Students will also complete requirements for Missouri Expanded Functions and Assisting in the Administration of and Monitoring Nitrous Oxide-Oxygen Anesthesia. Prerequisites: DAT 100, DAT 111, DAT 122, DAT 131, DAT 141, and DAT 151 with a grade of 75% or better. 5 credit hours.
DAT 171 Dental Materials II. This course teaches dental assisting students the properties and manipulation of the more specialized materials utilized in dental specialties in the process of providing dental care to patients. Students will learn to apply critical thinking in the selection and preparation of these dental materials as well as the proper clinical techniques required in working with these substances. Lab skills are taught and evaluated to preclinical, clinical, and/or lab proficiency. Prerequisites: DAT 100, DAT 111, DAT 122, DAT 131, DAT 141, and DAT 151 with a grade of 75% or better. 2 credit hours.

DAT 182 Dental Radiology II. This course emphasizes digital imaging, interpretation of radiographic findings, and correction of exposure and image handling and processing errors to attain diagnostically-acceptable images. In addition, students will demonstrate proficiency in identification of radiographic landmarks through written examinations. Knowledge of infection control and radiation safety for both the patient and dental assistant is of utmost concern when exposing radiographs; therefore, students will build on infection control and safety protocols learned in Dental Radiology I. Students will be required to expose radiographic images on a variety of patients during their clinical externship. Prerequisites: DAT 100, DAT 111, DAT 122, DAT 131, DAT 141, and DAT 151 with a grade of 75% or better. 3 credit hours.

DAT 190 Dental Office Procedures. This course will introduce students to administrative dental assistant duties such as: managing electronic dental records, information management, dental patient scheduling, inventory management, financial arrangements and collections, dental insurance processing, and bookkeeping procedures including both accounts receivable and accounts payable. Students will also learn to work with a digital practice management software system. Prerequisites: DAT 100, DAT 111, DAT 122, DAT 131, DAT 141, and DAT 151 with a grade of 75% or better. 2 credit hours.

DAT 191 Clinical Externship II. This course consists of approximately sixteen hours of clinical practicum per week in participating dental facilities. Building on skills obtained during Clinical Externship I, students continue to rotate through three general dental practices and observe two specialty practices for a minimum of 300 clinical hours. Prerequisites: DAT 100, DAT 111, DAT 122, DAT 131, DAT 141, and DAT 151 with a grade of 75% or better. 4 credit hours.
DRAFTING AND DESIGN ENGINEERING TECHNOLOGY

Classification of Instructional Programs – 15.1301

Associate of Applied Science Degree

The Drafting and Design Engineering Technology (DDT) program of State Technical College of Missouri is thorough and comprehensive, with a balanced mix of instruction in mechanical, architectural, civil, electrical, and structural drafting. The DDT program has been awarded program certification by the American Design Drafting Association (ADDA), a nationally-recognized professional drafting association, which assures a high quality program that benefits both education and industry. The DDT program is also accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

After a brief introduction to manual drafting techniques, drawings are produced using computer aided drafting (CAD). Using engineering data, specifications, and various equipment, drafting and engineering technicians assist in determining design changes and production costs. They may also be required to apply their knowledge to solve particular design problems such as those involving tolerance, stress, strain, bending, and compression. The department has two state-of-the-art CAD labs with the latest versions of software used in industry. Students are scheduled in small classes to ensure individual attention and high quality instruction.

Graduates of this program are qualified to take positions as industrial and architectural designers, drafting and engineering technicians, cost estimators, and quality assurance technicians. Drafting, design, and engineering technicians often assist engineers and architects with design and development work. Most drafting and engineering technicians work from rough sketches, specifications, and technical data furnished by engineers. Their job is to transform these ideas into precise drawings. Drafting and engineering technicians use handbooks and tables for computations concerning strength, reliability, and cost of materials.

Due to the green revolution, there has been a fundamental change in the way building projects are approached. Today’s skilled drafting and engineering technicians need to understand the fundamental concepts associated with improving environmental performance on every project. The Drafting and Design Engineering Technology program contributes to the green economy by emphasizing the fundamental concepts of sustainable design, green building practices, and why sustainability is important. The program also expands the discussion of green building strategies and technologies by studying the methods being used worldwide.

Enrollment in the Drafting and Design Engineering Technology program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions for the specific application requirements and deadline.

It is a graduation requirement of the Drafting and Design Engineering Technology (DDT) program for students to earn a grade of “C” or better in all “Core Curriculum” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/civiltech/ddt/ddtfacts/.

Program Mission

The Drafting and Design Engineering Technology program is a technical program constructed to provide students with the opportunity to develop technical knowledge, drafting skills, math skills, and effective communications skills, which enable them to take positions in industry as industrial and architectural designers, drafting and engineering technicians, cost estimators, and quality assurance technicians in the fields of mechanical, architectural, civil, electrical, and structural drafting.
**Program Goals**

The goals of the program are to provide the opportunity for students to develop:

- Technical knowledge to transform ideas to precise drawings using problem-solving skills.
- Drafting skills, by manual and computer methods, using state-of-the-art equipment and software.
- Math skills to solve design problems and compute strengths, reliability, and cost.
- Effective communication skills.
- Effective employment readiness skills.

### CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDT 111</td>
<td>Civil Drafting</td>
<td>3</td>
</tr>
<tr>
<td>DDT 150</td>
<td>Fundamentals of Drafting</td>
<td>3</td>
</tr>
<tr>
<td>DDT 153</td>
<td>Industrial Graphics</td>
<td>3</td>
</tr>
<tr>
<td>DDT 151</td>
<td>Mechanical Drafting with Dimensioning and Tolerancing</td>
<td>3</td>
</tr>
<tr>
<td>DDT 154</td>
<td>Industrial Design</td>
<td>3</td>
</tr>
<tr>
<td>DDT 183</td>
<td>Fundamentals of Computer Aided Drafting (CAD)</td>
<td>3</td>
</tr>
<tr>
<td>DDT 184</td>
<td>Advanced Applications of Computer Aided Drafting and Design (CADD)</td>
<td>3</td>
</tr>
<tr>
<td>DDT 220</td>
<td>Electrical Drafting</td>
<td>3</td>
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<tr>
<td>DDT 230</td>
<td>Architectural Drafting</td>
<td>3</td>
</tr>
<tr>
<td>DDT 252</td>
<td>Structural Steel Drafting</td>
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</tr>
<tr>
<td>DDT 254</td>
<td>Structural Detailing and Design</td>
<td>3</td>
</tr>
<tr>
<td>Optional:</td>
<td></td>
<td></td>
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<tr>
<td>DDT 163</td>
<td>Design Drafting Internship</td>
<td>(6)</td>
</tr>
<tr>
<td>PMT 240</td>
<td>Introduction to SolidWorks Design and Modeling</td>
<td>(3)</td>
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### GENERAL EDUCATION REQUIREMENTS

General Education Requirements

(see page 42-43)

Must Include:

- PHY 101/102 College Physics 4

May Not Include:

- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- MAT 119 Elementary Statistics 3
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

### PROGRAM REQUIREMENTS

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>MAT 121</td>
<td>Trigonometry</td>
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<tr>
<td>CVT 246</td>
<td>Statics</td>
<td>5</td>
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<tr>
<td>CVT 247</td>
<td>Strength of Materials</td>
<td>5</td>
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<tr>
<td>COM 211</td>
<td>Technical Writing</td>
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### GRADUATION REQUIREMENTS

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<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
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<td><strong>SUB-TOTAL</strong></td>
<td></td>
<td><strong>1</strong></td>
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It is a graduation requirement of the Drafting and Design Engineering Technology (DDT) program for students to earn a grade of “C” or better in all “Core Curriculum” courses.

**PROGRAM TOTAL** 69-78
DDT 111 Civil Drafting. A basic course in engineering drafting and sketching with emphasis on lettering techniques, map reading, earthwork cross-sections, survey platting and plan detailing. Drawings are developed using manual and computer-aided drafting techniques. Prerequisite: DDT 183. 3 credit hours.

DDT 130 Practical Drafting for the HVAC Trades. This course provides an introduction into basic drafting principles and modern shop practices related to the heating, ventilation, and air conditioning systems. 3 credit hours.

DDT 135 Introductory Drafting Fundamentals. This course is designed to develop the basic skills required for visualizing and interpreting industrial drawings. 3 credit hours.

DDT 150 Fundamentals of Drafting. This beginning course stresses the care and use of drafting instruments, lettering techniques, drafting terms, American National Standards Institute (ANSI) specifications, manual drawing, shape descriptions, geometric construction, and multiview projection. 3 credit hours.

DDT 151 Mechanical Drafting with Dimensioning and Tolerancing. Applying dimensions and tolerances to drawings of machine parts using the proper technique of dimensioning following ANSI specifications. Prerequisites: DDT 153 and DDT 183. 3 credit hours.

DDT 153 Industrial Graphics. This course teaches pictorial representations using standard types of projection, auxiliary views, section views, proper technical illustration, and dimensioning. Prerequisite: DDT 150. 3 credit hours.

DDT 154 Industrial Design. Applying the study of threads, fasteners, sections and descriptive geometry to machine working drawings; including CAD applications in detailing. Prerequisite: DDT 151. 3 credit hours.

DDT 163 Design Drafting Internship. The drafting internship is a planned work experience comprised of 420 hours of paid on-the-job training in a drafting or drafting related field requiring the student to perform a variety of tasks. A training agreement between the employer, the student and the college is required. The student will submit a weekly summary of activities (tasks performed). While the internship is not a program requirement for the Associate of Applied Science Degree, the student gains valuable practical experience in the workplace. Prerequisites: DDT 150, DDT 151, DDT 153, DDT 154, DDT 183, and DDT 184 with a grade of “C” or better and Department Chair approval. 6 credit hours.

DDT 183 Fundamentals of Computer Aided Drafting (CAD). An introduction to CAD graphic commands and applying the basic applications in producing drawings. Fundamentals in using the drawing, editing, and dimensioning commands for two-dimensional drawings. 3 credit hours.

DDT 184 Advanced Applications of Computer Aided Drafting and Design (CADD). Advanced applications in using CAD in the mechanical field in dimensioning and tolerancing including GDT, and also use of blocks and attributes. Three dimensional modeling with layout in paper space and extracting of orthographic views. Prerequisites: DDT 153 and DDT 183. 3 credit hours.

DDT 220 Electrical Drafting. This course is a study of the layout principles of electrical and electronic drawings stressing modern representation for block diagrams, schematic diagrams, logic diagrams, wiring/assembly drawings, printed circuit board layouts, and electrical one-line diagrams. Prerequisite: DDT 183 with a grade of “C” or better. 3 credit hours.

DDT 230 Architectural Drafting. This course teaches the fundamentals of architectural terms as applied in construction. Also covered are techniques for designing residential buildings such as planning and designing floor plans, elevations, foundations, details, and sections of buildings. Dimensioning techniques will be emphasized for accuracy. Prerequisite: DDT 183 with a grade of “C” or better. 3 credit hours.

DDT 252 Structural Steel Drafting. Structural steel terms and steel members used in different types of steel buildings. The study of American Institute of Steel Construction Steel Detailing Manual. Prerequisite: DDT 230. 3 credit hours.
**DDT 254 Structural Detailing and Design.** The application in detailing of concrete construction. The use of Portland Cement Association detailing manuals to create plans and detail drawings of pour-in-place and precast concrete. Prerequisite: DDT 252. 3 credit hours.

**DDT 299 Special Topics in Drafting and Design Engineering Technology.** Special Topics in Drafting and Design Engineering Technology (DDT) may include instruction on topics not covered in other DDT courses. Topics covered in other DDT courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
As a society we take for granted that our electric power will run 24 hours a day, 7 days a week so that we can have the food, clothing, homes, medical care, electronic devices and personal amenities we depend on. That’s why medical facilities, financial institutions, power companies, grocery stores, and even residential homes are now using backup generators to maintain electric power in the event of a power outage. Power generators are also used to deliver temporary electric power to oil fields, chemical plants, mining sites, construction sites, movie sets, and shipping yards. As a result the demand for power generators has dramatically risen based on society’s significant dependence on electric power.

The Electric Power Generation Technology’s (EPG) curriculum provides students with the opportunity to develop the skills needed to install, maintain, diagnose and service on-site power generation units. Electric power generators are used in a number of different scenarios including emergency standby power, prime power, co-generative power, or peak power. The program provides instruction in basic electricity, prime movers, motors, switchgears and governors. Students are exposed to the fundamentals of the electric grid and the impact of generators supporting the grid. The EPG program also recognizes clean energy by teaching students on low emission requirements and renewable energy power.

The Electric Power Generation Technology program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE) and the Equipment & Engine Training Council (EETC) in Generators, Compact Diesel Engines, and Four-Stroke Engines. Students will have the opportunity to become certified in Generators and Compact Diesel Engines through the EETC.

Employment opportunities for EPG graduates include but are not limited to transportation and power generation technicians, technical sales consultant, industrial maintenance technician, field service technician, sales representative, or service manager.

Enrollment in the EPG program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions for the specific application requirements and deadline. Students may be sponsored by an EPG dealer or company or other companies participating in alternative energy.

EPG is a fast-paced accelerated program designed to produce highly skilled alternative energy technicians. The EPG Associate of Applied Science degree is a highly specialized technical degree which requires entering students to hold an Associate of Applied Science degree or the equivalent in a mechanical, electrical or electronic field. The EPG One Semester Certificate is designed for those who have gained fundamental mechanical, electrical, or electronic skills through other means such as industry experience or college studies and are interested in upgrading their skills or changing careers.
It is a graduation requirement that a grade of “C” or better must be maintained in all Electric Power Generation Technology (EPG) courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/industrialtech/epg/epgfacts/.

**Program Mission**
The mission of the Electric Power Generation Technology program is to provide students with the opportunity to develop the technical and interpersonal skills necessary to succeed in today’s power generation and clean energy fields.

**Program Goals**
The goals of the program are to provide the opportunity for students to develop:

- Mechanical and electrical knowledge and skills needed to install, maintain, and service electric power generators.
- Mechanical and electrical knowledge and skills needed to install, maintain, and service clean energy devices.
- Mechanical and electrical knowledge and skills needed to install, maintain, and service electric power transfer and control devices.
- Mechanical and electrical knowledge and skills needed to install, maintain, and service multi-fueled and clean energy fueled generators.
- Critical thinking skills used in problem solving.
- Oral and written communication skills needed in the power generation and clean energy fields.

### CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPG 105</td>
<td>Basic Tooling and Safety</td>
<td>2</td>
</tr>
<tr>
<td>EPG 115</td>
<td>Basic Engine Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>EPG 125</td>
<td>Engine Systems Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>EPG 130</td>
<td>Generator, Alternator, and Motor Fundamentals</td>
<td>2</td>
</tr>
<tr>
<td>EPG 205</td>
<td>Generator Application and Installation</td>
<td>2</td>
</tr>
<tr>
<td>EPG 215</td>
<td>AC/DC Fundamentals and Motor Controls</td>
<td>3</td>
</tr>
<tr>
<td>EPG 235</td>
<td>Instruments, Controls, and Protection</td>
<td>2</td>
</tr>
<tr>
<td>EPG 245</td>
<td>Clean Energy Fundamentals</td>
<td>2</td>
</tr>
<tr>
<td>EPG 255</td>
<td>Troubleshooting and Diagnostics</td>
<td>2</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 21

### GENERAL EDUCATION REQUIREMENTS

General Education Requirements 19

(see page 42-43)

May Not Include:

- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

### PROGRAM REQUIREMENTS

Electives

Approved electives in electric power generation related topics such as electrical, mechanical, and electronic technologies and skills. Credits earned in prior degrees will be considered.

**SUB-TOTAL** 20
GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tr>
<td>COM 125 Job Search Strategies</td>
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</tbody>
</table>

SUB-TOTAL 1

It is a graduation requirement of the Electric Power Generation Technology (EPG) program for students to earn a grade of “C” or better in all “Electric Power Generation Technology (EPG)” courses.

PROGRAM TOTAL 61

ELECTRIC POWER GENERATION TECHNOLOGY

Classification of Instructional Programs – 47.0101

One Semester Certificate

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPG 105 Basic Tooling and Safety</td>
<td>2</td>
</tr>
<tr>
<td>EPG 115 Basic Engine Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>EPG 125 Engine Systems Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>EPG 130 Generator, Alternator, and Motor Fundamentals</td>
<td>2</td>
</tr>
<tr>
<td>EPG 205 Generator Application and Installation</td>
<td>2</td>
</tr>
<tr>
<td>EPG 215 AC/DC Fundamentals and Motor Controls</td>
<td>3</td>
</tr>
<tr>
<td>EPG 235 Instruments, Controls, and Protection</td>
<td>2</td>
</tr>
<tr>
<td>EPG 245 Clean Energy Fundamentals</td>
<td>2</td>
</tr>
<tr>
<td>EPG 255 Troubleshooting and Diagnostics</td>
<td>2</td>
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</tbody>
</table>

SUB-TOTAL 21

GRADUATION REQUIREMENT

It is a graduation requirement of the Electric Power Generation Technology (EPG) program for students to earn a grade of “C” or better in all “Electric Power Generation Technology (EPG)” courses.

PROGRAM TOTAL 21

**EPG 105 Basic Tooling and Safety.** This course teaches the basic tooling that will be used in the generator service field. The course will also cover hazards associated with electric power generation, safety rules, safe work practices, OSHA rules, regulations associated with this industry, and the reporting procedures and penalties that pertain to these regulations. 2 credit hours.

**EPG 115 Basic Engine Fundamentals.** This course teaches the basic core components of an engine. Also covered will be the theory, construction, and operation of the internal combustion engine. Emphasis is put on proper diagnosis, failure analysis, and service procedures according to manufacturers’ specifications. 3 credit hours.

**EPG 125 Engine Systems Fundamentals.** This course teaches the engine systems that comprise the complete unit. The following systems will be covered: ignition, starting, charging, fuel, exhaust, coolant, and governor. Also covered will be the steps in troubleshooting and diagnosing prime movers and their related components. 3 credit hours.
EPG 130 Generator, Alternator, and Motor Fundamentals. This course teaches the construction and operation of single and 3-phase generators, alternators, and motors. Also covered in this course are various load types, special applications, temperature, related components, and environmental concerns. 2 credit hours.

EPG 205 Generator Application and Installation. This course teaches the different systems that are important when installing a generator. Systems covered include: air, cooling, exhaust, fuel, starting, mounting, ventilation, load, and noise. Room design and sizing are considered. 2 credit hours.

EPG 215 AC/DC Fundamentals and Motor Controls. This course teaches the fundamentals of AC/DC and electromagnetic theory. Coils, relays, solenoids, contactors, and motor starters are also covered. Schematics are used to understand the functions of a switchgear control and transfer switch and how they are controlled. 3 credit hours.

EPG 235 Instruments, Controls, and Protection. This course teaches instruments, controls, and protection of the prime mover and the generator. The operation and troubleshooting of gauges, breakers, relays, controllers, sensors, and switches are also covered. 2 credit hours.

EPG 245 Clean Energy Fundamentals. This course teaches the fundamentals of clean and alternative energy solutions in the electric power generation industry. 2 credit hours.

EPG 255 Troubleshooting and Diagnostics. This course teaches the theory and skills of troubleshooting and diagnosis. These skills will be used to effectively locate and repair failures of the prime mover, generator, and control systems. 2 credit hours.

EPG 299 Special Topics in Electric Power Generation Technology. Special Topics in Electric Power Generation Technology (EPG) may include instruction on topics not covered in other EPG courses. Topics covered in other EPG courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
The Electrical Distribution Systems program at State Technical College of Missouri prepares individuals to climb wood pole structures, build and maintain electrical distribution systems, use safe work practices, administer first aid, and perform pole top rescue. Students also receive a strong foundation in math, communication, and critical thinking skills and are required to participate in an approved internship. This field has a high demand for experienced individuals resulting in relatively high pay.

The program is taught on a full-time basis and provides extensive hands-on training in small classes taught by faculty who have worked in this field. Courses in climbing skills, equipment operation, construction and maintenance of overhead lines, customer service, and general studies will develop the competencies required of the electrical line worker.

Students develop advanced skills required of electrical line workers through course work in transformers and transformer theory, conductors, metering, working with energized lines both overhead and underground, fusing, substations, and voltage regulation equipment. Students who graduate from this program have attained a basic understanding of distribution systems, which prepares students for employment in the field with an advanced apprenticeship rating.

Students who are admitted to the Electrical Distribution Systems program should be aware that some industry equipment safety requirements specify a weight limit of 350 pounds or less including required clothing, gear, and tools. The inability to meet this safety requirement will prevent participation in and completion of pole climbing, equipment operation, utility construction, and internship courses that are required to complete the Electrical Distribution Systems Associate of Applied Science degree. It may also prevent employment in positions that require the use of equipment with these safety specifications.

All students are prepared to earn Occupational Safety and Health Administration (OSHA) 10-hour training, CPR, First Aid, and Flagger certifications. Safety and electrical code requirements are stressed in all classes.

Enrollment in the Electrical Distribution Systems program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions for the specific application requirements and deadline.

Due to industry employment requirements, to enroll and remain enrolled in the Electrical Distribution Systems program, students are required to receive and maintain at all times a current, valid Class A Commercial Driver’s License (CDL). The CDL training and licensing require students to: 1) maintain a driving record that is eligible for a Missouri Class A CDL, 2) obtain a complete, current, and valid Medical Examination Report and Certificate for Commercial Driver Fitness Determination, and 3) successfully pass drug screen(s).

A grade of “C” (70%) must be maintained in all courses, including the internship, as part of the graduation requirement; due to state licensing requirements, students must earn a grade of “B” or better in the CDL classes. OSHA 10-hour, CPR, First Aid, and Flagger certifications are also included as graduation requirements. The attendance policy for Electrical Distribution Systems students is stricter than the college-wide policy. Students should be aware that in addition, they may also be subject to drug testing as a safety precaution.
The Electrical Distribution Systems program contributes to the green economy by recycling scrap material and using recycled products such as wood chips from the Three Rivers Electric Cooperative’s right-of-way tree trimming program in the outdoor pole climbing lab.

The Electrical Distribution Systems program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

To view program outcome data, visit https://www.statetechno.edu/programs/industrialtech/eds/edsfacts/.

**Program Mission**
The mission of the Electrical Distribution Systems program is to provide the students the knowledge and technical skills required to succeed in the electrical distribution industry.

**Program Goals**
The goals of the program are to provide the opportunity for students to develop:
- Effective communication skills both verbally and written.
- Mathematical skills necessary to calculate electrical loads, weights, and measures.
- Industry-wide safe work practices per American Public Power Association guidelines.
- Skills to gain entry-level employment in the electrical transmission and distribution field.
- Analytical problem solving and critical thinking skills necessary for employment in the electrical transmission and distribution field.

### CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>EDS 100</td>
<td>Customer Service for Utility Professionals</td>
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</tr>
<tr>
<td>EDS 110</td>
<td>Electrical Distribution Systems I</td>
<td>1</td>
</tr>
<tr>
<td>EDS 115</td>
<td>Electrical Distribution Systems II</td>
<td>1</td>
</tr>
<tr>
<td>EDS 120</td>
<td>Safety and Accident Prevention I</td>
<td>1</td>
</tr>
<tr>
<td>EDS 125</td>
<td>Safety and Accident Prevention II</td>
<td>1</td>
</tr>
<tr>
<td>EDS 150</td>
<td>Equipment Operation</td>
<td>3</td>
</tr>
<tr>
<td>EDS 155</td>
<td>Equipment Operation II</td>
<td>3</td>
</tr>
<tr>
<td>EDS 160</td>
<td>Climbing Skills</td>
<td>3</td>
</tr>
<tr>
<td>EDS 170</td>
<td>Construction and Maintenance of Overhead Lines</td>
<td>6</td>
</tr>
<tr>
<td>EDS 235</td>
<td>Electrical Utility Internship</td>
<td>8</td>
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<tr>
<td>EDS 238</td>
<td>Transformer Theory and Installation</td>
<td>4</td>
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<tr>
<td>EDS 241</td>
<td>Conductor Installation, Service, and Metering</td>
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<tr>
<td>EDS 252</td>
<td>Rubber Gloving Techniques</td>
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<td>EDS 259</td>
<td>Construction of Underground Electrical Systems</td>
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<tr>
<td>EDS 272</td>
<td>Fusing, Substation, and Voltage Regulation Equipment</td>
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</table>

**SUB-TOTAL** 43

### GENERAL EDUCATION REQUIREMENTS

General Education Requirements 19
(see page 42-43)

May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- MAT 119 Elementary Statistics 3
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19
**PROGRAM REQUIREMENTS**

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<th>Course Code</th>
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<tr>
<td>HEO 151</td>
<td>Basic Commercial Driver License</td>
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<td>HEO 152</td>
<td>Basic Commercial Driver License Lab</td>
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<tr>
<td>IEL 117</td>
<td>Circuitry Fundamentals w/Lab</td>
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<tr>
<td>EMS 120</td>
<td>Trigonometry for Industrial Electricity</td>
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<tr>
<td>OR MAT 121</td>
<td>Trigonometry</td>
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**SUB-TOTAL** 9

**GRADUATION REQUIREMENTS**

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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 1

It is a graduation requirement of the Electrical Distribution Systems (EDS) program for students to: 1) earn a grade of “C” or better in all courses; due to state licensing requirements, students must earn a grade of “B” or better in the CDL classes; and 2) earn OSHA 10-hour, CPR, First Aid, and Flagger certifications.

**PROGRAM TOTAL** 72

**EDS 100 Customer Service for Utility Professionals.** This course provides insights into the concepts and skills related to customer service for utility professionals. The course begins with an overview of the customer service environment and market trends and then focuses on specific skills needed to provide ethical customer service such as verbal and non-verbal communications, listening, and problem solving. Utility industry case studies involving service breakdowns will be used to challenge students to apply the concepts and skills learned to implement service recovery strategies. 1 credit hour.

**EDS 110 Electrical Distribution Systems I.** This course will give the student an overview of the types of electrical distribution systems in use. It is a comprehensive class with real world applications, operations, power conversion, control, measurement, and quality issues. Transmission and distribution structures and the power grid will also be covered. 1 credit hour.

**EDS 115 Electrical Distribution Systems II.** This course continues with the overview of the types of electrical distribution systems in use. It is a comprehensive class with real world applications, operations, power conversion, control, measurement, and quality issues. Transmission and distribution structures and the power grid will also be covered. Prerequisite: EDS 110 with a grade of “C” or better. 1 credit hour.

**EDS 120 Safety and Accident Prevention I.** This course teaches the hazards associated with electrical distribution systems. The student will be able to implement the proper climbing techniques, safety rules, and safe work practices from the American Public Power Association Safety Manual. The student will learn Occupational Safety and Health Administration (OSHA) rules and regulations associated with this industry, reporting requirements, and the penalties that pertain to these regulations. 1 credit hour.

**EDS 125 Safety and Accident Prevention II.** This course continues instruction on the hazards associated with electrical distribution systems. The student will be able to implement the proper climbing techniques, safety rules, and safe work practices from the American Public Power Association Safety Manual. The student will learn Occupational Safety and Health Administration (OSHA) rules and regulations associated with this industry, reporting requirements, and the penalties that pertain to these regulations. Prerequisite: EDS 120 with a grade of “C” or better. 1 credit hour.
EDS 150  Equipment Operation. The student will learn the various operations of different digger/derrick and bucket/basket aerial platform trucks used in the construction of electrical distribution systems. The student will be familiarized with the basic operation of trencher/backhoe equipment. This class also covers units on mobile hydraulic systems, vehicle maintenance and inspection, safety rules, rigging and lifting capacities, vehicle grounding practices, and the hands-on operation of digger/derrick and bucket/basket aerial platform trucks. 3 credit hours.

EDS 155  Equipment Operation II. This course teaches the various operations of directional boring machines and hydrovac trucks used in the construction of utility systems. The student will be familiarized with the basic operation of excavators and related excavation equipment. This course also covers units on hand, power, pneumatic, and hydraulic tools; equipment maintenance and inspection; safety rules; and the hands-on operation of directional boring machines and hydrovac trucks. 3 credit hours.

EDS 160  Climbing Skills. The student will gain the knowledge of the proper care of climbing tools and master the climbing of wood structures. Upon completion of this course the student will also be able to determine the proper aspects of pole inspection and be able to recognize the hazards of climbing. Successful completion of timed pole top rescue in two different methods. An introduction to aerial pole framing is included in this discipline. Prerequisite: EDS 150 with a grade of “C” or better. 3 credit hours.

EDS 170  Construction and Maintenance of Overhead Lines. This course will give the student a working knowledge of the Rural Utilities Service line construction specifications set forth by the Department of Agriculture. This will include the aspects of 12,500; 14,400; and 34,500 volt construction. Students will be able to recognize the different types of materials used for the different types of construction by sight and definition. Students will be required to demonstrate working specification knowledge both in aerial and ground situations as well as installation, repair and removal of poles, conductors, guy assemblies, cross arms, and insulators. They will also be introduced to the different sizes and types of overhead and underground conductors. Basic line staking principles and National Electric Safety Code clearances will be included. Prerequisite: EDS 160 with a grade of “C” or better. 6 credit hours.

EDS 235  Electrical Utility Internship. This will provide the student with a day-to-day knowledge of a working utility. The student will be required to complete at least two written assignments and fill out the required forms provided by the instructor. The instructor will check with the student on the jobsite to be sure that the requirements for the internship are being met. This course will be completed between the first and second years of the Electrical Distribution Systems program. Prerequisites: EDS 115, EDS 125, and EDS 170, with a grade of “C” or better, first aid and CPR certifications, and instructor’s permission based on valid Class A Commercial Driver’s License (CDL). 8 credit hours.

EDS 238  Transformer Theory and Installation. The student will gain a thorough knowledge of transformer theory and installation. Single-phase and three-phase configurations with different types of connections will be included. Other units covered will include over voltage and over current protection, equipment grounding, cutout protection, proper cover-up techniques, lightning arrestor application and installation, Rural Utility Service specifications, and pole framing. Basic troubleshooting practices and current and potential transformers will also be included. Prerequisites: EDS 115, EDS 125, and EDS 170 with a grade of “C” or better. 4 credit hours.

EDS 241  Conductor Installation, Service, and Metering. The student will gain extensive knowledge of single- and three-phase watt-hour meters; meter locations; and the different types of copper and aluminum conductors. The student will also gain practical experience in the sizing, installation, stringing, sagging, dead-ending, and splicing of service conductors. The student will also be exposed to the construction of meter loops and poles; instrument metering; temporary meter locations; compression sleeves; connectors and tools including strap hoists, chain hoists, sag charts and tables, pulling grips and mechanical jumpers. Also included are disciplines on meter tampering, power theft, proper grounding techniques and safe work practices. Prerequisites: EDS 238 and EDS 252 with a grade of “C” or better. 4 credit hours.
**EDS 252  Rubber Gloving Techniques.** The student will obtain basic discipline in the methods of working on energized lines with rubber gloves and rubber sleeves from an insulated aerial platform in a safe and efficient manner. The student will be exposed to the care and well-being of soft and hard shell rubber goods and their application. The student will also receive instruction on personal protective equipment, hot-line tools, and live-line maintenance. The safe operation of aerial platforms and grounding practices will also be reviewed. Prerequisites: EDS 115, EDS 125, and EDS 170 with a grade of “C” or better. 2 credit hours.

**EDS 259  Construction of Underground Electrical Systems.** The student will gain working knowledge of Underground Rural Distribution (URD) systems. The student will receive practical experience in primary and secondary cables, installation of 200 and 600 amp elbows, splices, lightening arresters, and overhead terminations. The installation of single- and three-phase padmount transformers will also be covered. Safe work practice requirements for shoring and sloping trenches will be discussed. Troubleshooting of primary and secondary cable fault locating and safe work practices and procedures may be covered. Prerequisites: EDS 238, EDS 252, and UST 155 with a grade of “C” or better. 3 credit hours.

**EDS 272  Fusing, Substation, and Voltage Regulation Equipment.** The student will be introduced to the different types and methods of system coordination, substations, capacitors, voltage regulators and auto-boosters. A working knowledge of oil reclosures, sectionalizers and the application of fuses will also be gained. Practical experience will be gained in the grounding, inspection, maintenance and operation of basic substations. The course will also introduce single- and three-phase pole mount reclosures, gang operated air break and load break switches, and substation fuses and reclosures. Prerequisites: EDS 238 and EDS 252 with a grade of “C” or better. 2 credit hours.

**EDS 299  Special Topics in Electrical Distribution Systems.** Special Topics in Electrical Distribution Systems (EDS) may include instruction on topics not covered in other EDS courses. Topics covered in other EDS courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
Experts predict that the 21st century will continue to be dominated by unprecedented advancements in knowledge and science, largely attributable to the accelerated growth in electronics technology. As the electronic systems and equipment that power our personal and professional lives become more pervasive and integral to our existence, the expertise of the electronics technologist is increasingly vital. The Electronics Engineering Technology degree program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

The Electronics Engineering Technology program provides graduates with a diverse knowledge base and a comprehensive understanding of the principles of electricity, microcomputers, communications and industrial electronics. Graduates have the ability to apply these concepts in solving technical and scientific problems. Emphasis on practical skills and state-of-the-art applications ensure immediate applicability to the needs of industry.

Students will take the Electronics Technicians Association (ETA) Associate Certified Electronics Technician (CETa) and journeyman level assessment exams. Once the CETa certificate is earned, students are then eligible for additional industry-recognized assessment exams.

The Electronics Engineering Technology program contributes to the green economy by recycling and reusing motors and other electronic equipment components for student projects.

Students enrolling in the Electronics Engineering Technology program have two degree options to choose from:

**Electronics Engineering Technology General Option**
The General Option focuses on the fundamentals of the technology driving today’s systems, including computer systems, telecommunications, networks, wireless, controls and instrumentation. Graduates have a broad knowledge base that qualifies them for challenging career-entry positions in the dynamic electronics fields. The Electronics Engineering Technology General Option is accredited by the Federal Aviation Administration’s Air Traffic Organization, Technical Operations, Collegiate Training Initiative.

**Electronics Engineering Technology Biomedical Engineering Technology Option**
The Biomedical Engineering Technology Option provides Electronics Engineering Technology students and graduates with an intensive, hands-on experience that concentrates on general biomedical equipment with an introduction to diagnostic imaging. Students in this option will also become qualified to take the Association for the Advancement of Medical Instrumentation (AAMI) certification exam.
The Biomedical Equipment Technology One Semester Certificate is also available for those who have gained electronics knowledge and skills through other means such as industry experience or college studies. The certificate provides qualified students with the opportunity to develop additional skills needed to enter the biomedical equipment technology field.

Students who are interested in either the biomedical option or certificate need to be aware that criminal background checks are typically required by healthcare organizations prior to an internship and/or employment.

To view program outcome data, visit https://www.statetechmo.edu/programs/industrialtech/eet/eetfacts/.

Program Mission
The mission of the Electronics Engineering Technology program is to provide our students with the knowledge, skills, and attitudes required for a challenging and successful career in the field of electronics through an intensive program that focuses on problem solving and critical thinking.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Effective communication skills including teamwork and interpersonal skills.
- Analysis, troubleshooting, and problem solving techniques.
- Technical knowledge, understanding, and rationale for all applied tasks associated with all major subject areas.
- Ability to research and utilize component data using specification sheets and reference manuals.
- Skills in the repair or upgrade of advanced electronics systems.
- Professional attitudes toward the emerging electronics industry including continuing education.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EET 125</td>
<td>Digital Electronics w/Lab</td>
<td>4</td>
</tr>
<tr>
<td>EET 126</td>
<td>DC/AC Circuit Analysis</td>
<td>6</td>
</tr>
<tr>
<td>EET 127</td>
<td>DC/AC Circuit Analysis Lab</td>
<td>2</td>
</tr>
<tr>
<td>EET 131</td>
<td>Semiconductor Devices and Analog Circuits Lab</td>
<td>2</td>
</tr>
<tr>
<td>EET 132</td>
<td>Semiconductor Devices and Analog Circuits</td>
<td>3</td>
</tr>
<tr>
<td>EET 140</td>
<td>Microcomputer Hardware, Operation and Repair</td>
<td>4</td>
</tr>
<tr>
<td>EET 150</td>
<td>Lasers and Optics</td>
<td>3</td>
</tr>
<tr>
<td>EET 210</td>
<td>Electronic Controls with Lab</td>
<td>5</td>
</tr>
<tr>
<td>EET 238</td>
<td>Electronic Telecommunications with Lab</td>
<td>3</td>
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<tr>
<td>COM 211</td>
<td>Technical Writing</td>
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<tr>
<td>MAT 121</td>
<td>Trigonometry</td>
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<tr>
<td>Optional:</td>
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<tr>
<td>EET 155</td>
<td>Fiber Optic Principles</td>
<td>(3)</td>
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SUB-TOTAL 38-41

GENERAL EDUCATION REQUIREMENTS

General Education Requirements 19
(see page 42-43)
Must Include:
- MAT 115 College Algebra 3
- PHY 101/102 College Physics 4
- NST 101 Network Fundamentals 3

May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4

SUB-TOTAL 19
PROGRAM REQUIREMENTS

General Option

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<thead>
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<tr>
<td>EET 230</td>
<td>Microcontrollers and Embedded Systems</td>
<td>4</td>
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<tr>
<td>EET 250</td>
<td>Capstone with Embedded Controller Application</td>
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</tr>
<tr>
<td>EET 270</td>
<td>Electronic Systems Applications</td>
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OR

Biomedical Engineering Technology Option

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<tbody>
<tr>
<td>EET 105</td>
<td>Applied Human Anatomy and Physiology</td>
<td>3</td>
</tr>
<tr>
<td>EET 225</td>
<td>Diagnostic Imaging</td>
<td>3</td>
</tr>
<tr>
<td>EET 226</td>
<td>Biomedical Instrumentation Systems</td>
<td>4</td>
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<td>EET 227</td>
<td>Biomedical Instrumentation Systems Lab</td>
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<td>OR</td>
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<td>EET 170</td>
<td>Biomedical Engineering Technology Internship</td>
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GRADUATION REQUIREMENT

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PROGRAM TOTAL 70-75

BIOMEDICAL EQUIPMENT TECHNOLOGY

Classification of Instructional Programs - 15.0303
One Semester Certificate

CORE CURRICULUM

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<th>Course</th>
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<td>3</td>
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<tr>
<td>EET 150</td>
<td>Lasers and Optics</td>
<td>3</td>
</tr>
<tr>
<td>EET 175</td>
<td>Biomedical Equipment Technology Internship</td>
<td>4</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EET 227</td>
<td>Biomedical Instrumentation Systems Lab</td>
<td>2</td>
</tr>
<tr>
<td>EET 225</td>
<td>Diagnostic Imaging</td>
<td>3</td>
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<tr>
<td>EET 226</td>
<td>Biomedical Instrumentation Systems</td>
<td>4</td>
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GRADUATION REQUIREMENT

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<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
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</tr>
<tr>
<td><strong>SUB-TOTAL</strong></td>
<td></td>
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</table>

PROGRAM TOTAL 16-18

**EET 105**  Applied Human Anatomy and Physiology. This course is an overview of the body systems, structures, and functions. Emphasis is placed on the nervous, cardiovascular and respiratory systems. 3 credit hours.

**EET 120**  Basic Electricity and Electronics. This course introduces the fundamental concepts of electricity/electronics and test equipment to non-electrical/electronic majors. Topics include basic DC and AC principles (voltage, current, resistance, and impedance); components (resistors, inductors, capacitors, and semiconductors); power; and the operation of test equipment. Upon completion of this course the student will be able to construct and analyze/troubleshoot basic DC and AC circuits (series, parallel, and series-parallel). 3 credit hours.
EET 125  **Digital Electronics w/Lab.** Logic design, combinational logic circuits, sequential logic circuits, timing concepts, digital arithmetic operations and circuits, integrated circuit logic families, MSI/LSI logic circuits, memory devices and circuits, microprocessor architecture, instruction types and addressing modes and memory organization. Also includes a laboratory course with experiments designed to support this course. Prerequisite: MAT 051 with a grade of “C” or better. 4 credit hours.

EET 126  **DC/AC Circuit Analysis.** This course teaches theoretical and practical analysis of electrical physics, conductors, semiconductors, and insulators. Topics include resistance, capacitance, inductance, application of laws and theorems, conversion of electrical units, power, and energy. Also included is theoretical analysis of DC and AC series and parallel combinational circuits, voltage dividers, magnetism, and electromagnetism. Other topics include: test equipment and meter scales, waveforms and waveform analysis, vector analysis, reactive circuits, and filter construction and application. Concurrent: EET 127. 6 credit hours.

EET 127  **DC/AC Circuit Analysis Lab.** This laboratory is designed to teach theory of diagnosis and use of electronic instruments in conjunction with electrical safety. It is also designed to provide practical experience in the construction, analysis, and troubleshooting of basic electronic circuits. Concurrent: EET 126. 2 credit hours.

EET 131  **Semiconductor Devices and Analog Circuits Lab.** This laboratory is designed to provide practical experience in the construction, analysis and troubleshooting of electronic devices. Breadboarding of circuits utilizing electronic devices will be performed. Prerequisite: EET 127. Concurrent: EET 132. 2 credit hours.

EET 132  **Semiconductor Devices and Analog Circuits.** This course teaches the analysis and design of circuits, utilizing both discrete and integrated circuit components, are implemented into various system applications. Topics include: electronic conduction in conductors and semiconductors, the pn junction, diodes, diode circuits, special purpose diodes, bipolar transistors, transistor fundamentals, transistor biasing, AC models, amplifiers, field effect transistors (FET), FET circuits, operational amplifiers, amplifier frequency effects, negative feedback, and linear op-amp circuits. Prerequisite: EET 126. Concurrent: EET 131. 3 credit hours.

EET 140  **Microcomputer Hardware, Operation and Repair.** This course teaches: operating systems; motherboards; central processing units (CPUs); power supplies; input and output devices; magnetic storage devices; laptops; troubleshooting, repair, and introduction to networking. Also includes laboratory work with experiments designed to support course objectives. 4 credit hours.

EET 150  **Lasers and Optics.** This course teaches the fundamentals of lasers and optics. It covers the nature and properties of light, optical handling and positioning, light sources, laser safety, basic geometric optics, basic physical optics, and principles of laser operation. Corequisite: MAT 071 or equivalent or placement into college-level algebra. 3 credit hours.

EET 155  **Fiber Optic Principles.** This course teaches the principles of fiber optics, fiber optic networks, optical fiber cable types, estimating and bidding for fiber optic installation, specifying fiber optic cable, and understanding the guidelines for fiber optic design and installation. The course also covers the principles of fiber optic hardware to include connectors, splices, tools, and test equipment. Planning the fiber installation, fiber optic safety, pulling the fiber, and fiber restoration are also covered. 3 credit hours.

EET 170  **Biomedical Engineering Technology Internship.** The internship is a work experience in a biomedical facility under the supervision of an experienced biomedical engineering technician or biomedical equipment technician. The student will assist in the performance of safety inspections, preventive maintenance, repairs and calibration of various medical equipment. Corequisite: EET 105. 4 credit hours.

EET 175  **Biomedical Equipment Technology Internship.** The internship is a work experience in a biomedical facility under the supervision of an experienced biomedical engineering technician or biomedical equipment technician. The student will assist in the performance of safety inspections, preventive maintenance, repairs and calibration of various medical equipment. Corequisite: EET 226. 4 credit hours.

EET 210  **Electronic Controls with Lab.** This course includes operational amplifiers for industrial applications, linear integrated circuits for industrial applications, A/D and D/A conversion, DC motors and generators, industrial control devices and circuits, power control devices and circuits, thyristors, optical electronics control devices,
temperature and humidity transducers, industrial control applications and circuits, pulse modulation techniques, data acquisition, and industrial telemetry and data communication. Also includes a laboratory course with experiments designed to support this course. Prerequisites: EET 125, EET 132 and EET 131. 5 credit hours.

EET 225 Diagnostic Imaging. This course covers the theory of diagnostic imaging. Primarily the theory of x-ray imaging is covered. Safety issues related to servicing x-ray equipment are also covered. An overview of nuclear and ultrasound imaging is taught. Prerequisites: EET 125, EET 132 and EET 131. 3 credit hours.

EET 226 Biomedical Instrumentation Systems. Topics taught in this course are sensors, transducers, and electronic circuits associated with biomedical instrumentation. Operation, maintenance, diagnostics, calibration, and preventive maintenance of various types of biomedical instrumentation will be covered. Origination of biopotentials will be discussed. Electrodes and circuitry used to record electroencephalograms, electromyography, and electrocardiograms will be analyzed. Prerequisites: EET 105, EET 140, and EET 210. 4 credit hours.

EET 227 Biomedical Instrumentation Systems Lab. This lab course covers sensors, transducers, and electronic circuits associated with biomedical instrumentation. Operation, maintenance, diagnostics, preventive maintenance, calibration, and electrical safety tests will be performed on various types of biomedical instrumentation. Electrodes and circuitry used to record electroencephalograms, electromyography, and electrocardiograms will be analyzed. Corequisite: EET 226. 2 credit hours.

EET 230 Microcontrollers and Embedded Systems. This course teaches system-level design of embedded systems with a top-down design approach. Assembly language programming skills are developed using editor/assembler software. The lectures teach fundamental concepts, theory and design principles of embedded systems, while the labs provide students the opportunities to apply the learned concepts. Topics will include: basic concepts of embedded control systems and applications of microcontrollers, basics of structured programming using assembly language, architecture of the microcontroller, interfacing with off-chip peripheral hardware, and microcontroller programming techniques. Prerequisites: EET 125 and EET 140 with a grade of “C” or better. 4 credit hours.

EET 238 Electronic Telecommunications with Lab. This course is designed to study all the relevant aspects of communications systems. Topics include: signals and their spectra; noise; amplitude; frequency, angle, and phase modulation; analog to digital conversion; radio telemetry; transmission lines; antennas; antenna wave propagation; and lasers and fiber optic techniques. The course also includes a laboratory component where digital and analog communication systems are emphasized. Prerequisites: EET 131 and EET 132. 3 credit hours.

EET 250 Capstone with Embedded Controller Application. This course provides a comprehensive technical survey of the important topics in production automation systems and systems integration. It combines the hardware configuration, input/output modules, memory organizations, and instruction sets of several different programmable controllers with ladder logic, flow line production, industrial robotics, group technology, flexible manufacturing systems, automated inspection, process control, and computer integrated manufacturing (CIM). Students design and model a CIM system using an embedded controller and electronics components/technology that have been taught in previous Electronics Engineering Technology classes. Skills in system design and layout, controller design, hardware interfacing, control and timing implementation, and software interfacing are developed. Prerequisites: EET 210 and EET 230. 5 credit hours.

EET 270 Electronic Systems Applications. This course teaches students to analyze and design the applications of electronic systems in today's world. Topics include radio frequency (RF) signal analysis with spectrum analyzer, avionics system analysis, wireless data transmission, transceiver design and implementation, cables and cabling concepts, soldering standards, fiber optics, robotics design and implementation, and access and fire control systems. This course is primarily lab focused where application of electronic systems are emphasized. Prerequisite: EET 210 with a grade of “C” or better. Corequisite: EET 238. 3 credit hours.

EET 299 Special Topics in Electronics Engineering Technology. Special Topics in Electronics Engineering Technology (EET) may include instruction on topics not covered in other EET courses. Topics covered in other EET courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
GENERAL TECHNOLOGY

Classification of Instructional Programs – 30.9999

Associate of Applied Science Degree

The General Technology (GNT) program is designed to meet specific employer needs in a variety of different technical career areas that require multifunctional employees. The college advisor, the student, and the sponsoring industry employer together will develop an education plan based on the intended career focus. Degree requirements are based on the advisor approved curriculum.

The degree includes 19 credit hours in the college’s General Education Core Requirements of Oral and Written Communication, Mathematics, Science, Social Science, and Technical Literacy, 32-34 credit hours in two or more disciplines including six to eight credit hours of internship with the sponsoring employer, 12-14 credit hours of advisor approved electives, and a one credit hour Job Search Strategies course. The intent of this degree is to serve employer sponsored students.

To view program outcome data, visit https://www.statetechmo.edu/programs/industrialtech/gnt/gntfacts/.

Program Mission

The mission of the General Technology program is to provide students with the opportunity to develop the technical and interpersonal skills necessary to succeed in today’s multifunctional career fields.

Program Goals

The goals of the program are to provide the opportunity for students to develop:

- The knowledge and skills identified in the chosen technical concentration.
- Critical thinking skills used to troubleshoot in a multifunctional career.
- Oral, analytical, mathematical, and written communication skills needed in a multifunctional career.

<table>
<thead>
<tr>
<th>CORE CURRICULUM</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>Approved technical courses from two or more disciplines</td>
<td>26</td>
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<tr>
<td>Approved technical internship</td>
<td>6-8</td>
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<tr>
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GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see page 42-43)

| Approved general education courses | 19 |
| SUB-TOTAL | 19 |

PROGRAM REQUIREMENTS

| Approved electives from any technical area | 12-14 |
| SUB-TOTAL | 12-14 |

GRADUATION REQUIREMENT

| Job Search Strategies | 1 |
| SUB-TOTAL | 1 |

PROGRAM TOTAL | 64-68 |
The Heating, Ventilation, & Air Conditioning Technology program is a center of excellence for teaching alternative energy technicians to install, service, and repair heating, refrigeration and air conditioning systems. Basic heating, refrigeration and air conditioning theory are enhanced with extensive hands-on training in laboratories and on in-service equipment. Comprehensive coverage is given to electrical motors, controls and wiring and systems diagnosis and repairs.

The Heating, Ventilation, & Air Conditioning Technology (HVT) program began contributing to the green economy in 1973 by teaching students to install and maintain high efficiency furnaces, air conditioning units, air source heat pumps, and geothermal ground source heat pumps that save energy in commercial and residential settings. Instruction on alternative energy sources is also included in the program. The HVT program also uses setback thermostats, recycles refrigerant, and reuses equipment components and parts for training.

This program has provided special emphasis in geothermal technology for over 35 years. Geothermal energy production is a $1.5 billion industry, which generates electricity or provides heat for direct applications including aquaculture, crop drying, and district heating or for use in heat pumps to heat and cool buildings. Students use real world geothermal equipment in laboratory classes where they learn to install, maintain, and repair geothermal systems.

Presently, 95% of all main campus buildings operate with geothermal systems to gain energy efficiencies, reduce harmful emissions, save taxpayer dollars, and provide a geothermal learning laboratory.

Graduates may be employed in the installation, maintenance, repair, or sales of residential or commercial HVAC systems or operate their own businesses. Commercial applications may include grocery stores, healthcare facilities, hotels and resorts, manufacturing operations, educational institutions, and other operations.

The Heating, Ventilation, & Air Conditioning Technology program has two national accreditations: HVAC Excellence and the Association of Technology, Management, and Applied Engineering (ATMAE).

Enrollment in the Heating, Ventilation, & Air Conditioning Technology program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions for the specific application requirements and deadline.

It is a graduation requirement that a grade of “C” or better must be maintained in all Heating, Ventilation, & Air Conditioning Technology (HVT) courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/industrialtech/hvt/hvtfacts/.

Program Mission
The mission of the Heating, Ventilation, & Air Conditioning Technology program is to prepare students with a foundation to install, service, and repair refrigeration, heating, and air conditioning systems.
**Program Goals**

The goals of the program are to provide the opportunity for students to develop:

- Analytic and problem solving in the heating, ventilation, air conditioning, and refrigeration (HVAC/R) industry.
- Technical knowledge in servicing and repairing heating, air conditioning, and refrigeration equipment.
- Effective communication and interpersonal skills.
- Working knowledge of the safety standards as related to the HVAC/R field.

**CORE CURRICULUM**

<table>
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<th>Course</th>
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<tr>
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<tr>
<td>HVT 155</td>
<td>Electrical Fundamentals I</td>
<td>4</td>
</tr>
<tr>
<td>HVT 160</td>
<td>Fundamentals of Refrigeration and Air Conditioning II</td>
<td>7</td>
</tr>
<tr>
<td>HVT 166</td>
<td>Electrical Fundamentals II</td>
<td>4</td>
</tr>
<tr>
<td>HVT 251</td>
<td>Residential and Commercial Heating and Cooling I</td>
<td>6</td>
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<tr>
<td>HVT 252</td>
<td>Residential and Commercial Heating and Cooling II</td>
<td>6</td>
</tr>
<tr>
<td>HVT 255</td>
<td>Internship</td>
<td>8</td>
</tr>
<tr>
<td>HVT 261</td>
<td>Air Conditioning and Refrigeration Motors and Controls</td>
<td>3</td>
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<tr>
<td>HVT 264</td>
<td>Commercial Refrigeration Systems</td>
<td>2</td>
</tr>
<tr>
<td>HVT 270</td>
<td>Sheet Metal Duct Fabrication</td>
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<tr>
<td></td>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>49</strong></td>
</tr>
</tbody>
</table>

**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements 19
(see page 42-43)

May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

**PROGRAM REQUIREMENT**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDT 130</td>
<td>Practical Drafting for the HVAC Trades</td>
<td>3</td>
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**GRADUATION REQUIREMENTS**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

It is a graduation requirement for students to earn a grade of “C” or better in all “Heating, Ventilation, & Air Conditioning Technology (HVT)” courses.

**PROGRAM TOTAL** 72

**HVT 140**  *Fundamentals of Refrigeration and Air Conditioning I.* This course teaches the theory and practical applications of refrigeration and air conditioning. Basic psychrometry, heat transfer and thermodynamics, and fundamental refrigeration and air conditioning systems are included. The selection and safe handling of tools and materials, forming, fitting, brazing and soldering of tubing are taught. Students are taught to use cleaning solvents, refrigeration oils, and refrigerants. Students can earn certifications from HVAC Excellence and the Environmental Protection Agency (EPA). 7 credit hours.

**HVT 155**  *Electrical Fundamentals I.* This course teaches hazards associated with heating and air-conditioning equipment, how electricity is produced, AC and DC circuits, series and parallel circuits, Ohms law, reading and using wiring diagrams, and how to use electrical testing equipment. 4 credit hours.
HVT 160  **Fundamentals of Refrigeration and Air Conditioning II.** This course teaches the maintenance and service of evaporators, compressors, refrigerant control valves, electrical motors and controls, receivers, and accessories. Students learn skills and proper procedures in the operation, maintenance, servicing, and sizing of refrigeration and air conditioning equipment. Prerequisite: HVT 140 with a grade of “C” or better. Corequisite: HVT 155 with a grade of “C” or better. 7 credit hours.

HVT 166  **Electrical Fundamentals II.** This course teaches how to identify the different ways electricity is produced and the correct way to size and install high voltage wiring for heating, ventilation, and air conditioning (HVAC) equipment. Students will also learn about the individual components of an electric motor and how they operate, and the basic controls used in the HVAC industry. Emphasis will be placed on how to diagnose motors and controls used in the HVAC industry. Prerequisite: HVT 155 with a grade of “C” or better. 4 credit hours.

HVT 251  **Residential and Commercial Heating and Cooling I.** This course teaches air conditioning, gas furnace, and oil furnace systems and components. Emphasis is placed on developing the ability to install, troubleshoot, and service residential and commercial systems, components, and controls. Equipment selection for various applications is also covered. Prerequisite: HVT 160 with a grade of “C” or better. 6 credit hours.

HVT 252  **Residential and Commercial Heating and Cooling II.** This course teaches electric furnace, air source heat pump, and geothermal ground source heat pump systems and components. Emphasis is placed on developing the ability to install, troubleshoot, and service residential and commercial systems, components, and controls. Equipment selection for various applications is also covered. Prerequisite: HVT 251 with a grade of “C” or better. 6 credit hours.

HVT 255  **Internship.** Training is provided by skilled journeymen HVAC technicians under a training agreement. Prerequisite: HVT 160 with a grade of “C” or better. 8 credit hours.

HVT 261  **Air Conditioning and Refrigeration Motors and Controls.** This course teaches motor and control use in air conditioning and refrigeration systems with emphasis on types, theory, and application. Students learn to design and troubleshoot motor and control circuits. Prerequisites: HVT 155 and HVT 166 with a grade of “C” or better. 3 credit hours.

HVT 264  **Commercial Refrigeration Systems.** This course teaches testing, troubleshooting, and servicing of commercial refrigeration systems. Prerequisites: HVT 251 and HVT 261 with a grade of “C” or better. 2 credit hours.

HVT 270  **Sheet Metal Duct Fabrication.** This course teaches the sizing, layout, fabrication, and installation of sheet metal duct work in the HVAC trade. Prerequisite: DDT 130 with a grade of “C” or better. 2 credit hours.

HVT 299  **Special Topics in Heating, Ventilation, & Air Conditioning Technology.** Special Topics in Heating, Ventilation, & Air Conditioning Technology (HVT) may include instruction on topics not covered in other HVT courses. Topics covered in other HVT courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
The Heavy Equipment Operations program is designed to produce operators trained in the major classifications of earth moving equipment. The program starts in June and runs for eleven months. Students receive extensive training in the operation of dozers, scrapers, wheel loaders, backhoes, excavators, graders, and skid steers on a 40-acre operation site. Classroom instruction includes units in a number of related subjects such as grade operations, blueprint reading, and preventive maintenance. Attendance for all 1,235 instructional hours of the program is critical due to the hands-on-nature of the program and federal financial aid requirements. The Heavy Equipment Operations program is accredited by the National Center for Construction Education and Research (NCCER).

Skills are developed on both simulated and actual construction projects. The college works with local agencies, high schools, and colleges in providing practical on-the-job experience when possible. Students will perform manual labor usually associated with these tasks such as bolting pipe and shoveling.

The program includes 120 hours of classroom and driving instruction to prepare students for the Class A Commercial Driver’s License (CDL) written and driving examinations. In order to enroll or continue in the Heavy Equipment Operations program students must be eligible to take the Class A Commercial Driver’s License (CDL) examination and maintain eligibility until a Class A Commercial Driver’s License (CDL) is obtained. If the student becomes ineligible to take the Class A Commercial Driver’s License (CDL) examination or loses their Class A Commercial Driver’s License (CDL) the student will not continue in the Heavy Equipment Operations program. As in industry, students will be required to pass random drug tests to enter and remain enrolled in this program.

Enrollment in the Heavy Equipment Operations program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions for the specific application requirements and deadline.

Students will complete an internship or a directional boring course once they have earned a grade of “C” or better in all “Core Curriculum” courses and a grade of “D” or better in all General Education Requirement courses, pass the exit exam, and obtain the approval of their advisor. Students on internships are temporary employees of the company where they receive training. They are supervised by both their employers and by representatives of the college. In addition to the random drug testing described above, internship employers may also require drug testing. Students who do not pass a drug test during their internship will not continue in the Heavy Equipment Operations program.

The Heavy Equipment Operations program contributes to the green economy by burning the college’s used motor oil in a Department of Natural Resources (DNR) permitted furnace to heat the Heavy Equipment Operations building. The Heavy Equipment Operations department also recycles approximately ten tons of scrap iron annually from used undercarriages, bearings, and other equipment parts.

It is a graduation requirement of the Heavy Equipment Operations (HEO) one-year certificate for students to earn a grade of “C” or better in all “Core Curriculum” courses; due to state licensing requirements, students must earn a grade of “B” or better in the CDL class.
Graduates can expect to find entry-level employment in the following fields: county, state, and interstate highway construction; levee construction; agricultural construction; airport development; and commercial and residential construction.

To view program outcome data, visit [https://www.statetechmo.edu/programs/civiltech/heo/heofacts/](https://www.statetechmo.edu/programs/civiltech/heo/heofacts/).

**Program Mission**
The mission of the Heavy Equipment Operations program is to provide the opportunity for students to develop the technical and interpersonal skills required to be successful in the horizontal construction industry.

**Program Goals**
The goals of the program are to provide the opportunity for students to develop:
- Knowledge and skills required to assure that procedures related to the operation of heavy equipment are followed in accordance with industry standards.
- Technical competencies in the major classifications of earth moving equipment.
- Effective communication skills necessary to succeed in the industry.

### CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEO 100</td>
<td>First Aid and Safety</td>
<td>1</td>
</tr>
<tr>
<td>HEO 102</td>
<td>Basics of Heavy Equipment Operation</td>
<td>1</td>
</tr>
<tr>
<td>HEO 105</td>
<td>Orientation to the Trade</td>
<td>1</td>
</tr>
<tr>
<td>HEO 106</td>
<td>Introduction to Heavy Equipment Operations</td>
<td>1</td>
</tr>
<tr>
<td>HEO 108</td>
<td>Introduction to OSHA Regulations</td>
<td>1</td>
</tr>
<tr>
<td>HEO 121</td>
<td>Environmental Compliance</td>
<td>1</td>
</tr>
<tr>
<td>HEO 122</td>
<td>Applied Measurements In Construction</td>
<td>3</td>
</tr>
<tr>
<td>HEO 131</td>
<td>Heavy Equipment Operations Internship</td>
<td>3</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HEO 145</td>
<td>Directional Boring</td>
<td>4</td>
</tr>
<tr>
<td>HEO 134</td>
<td>Safety and Loss Control</td>
<td>3</td>
</tr>
<tr>
<td>HEO 138</td>
<td>Advanced Operating Techniques</td>
<td>1</td>
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<tr>
<td>HEO 139</td>
<td>Grade Operations</td>
<td>2</td>
</tr>
<tr>
<td>HEO 146</td>
<td>Backhoe and Excavator</td>
<td>4</td>
</tr>
<tr>
<td>HEO 147</td>
<td>Dozer, Scraper, and Compaction Equipment</td>
<td>4</td>
</tr>
<tr>
<td>HEO 148</td>
<td>Loader</td>
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</tr>
<tr>
<td>HEO 149</td>
<td>Motor Grader and Skid Steer</td>
<td>4</td>
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<tr>
<td>HEO 150</td>
<td>Commercial Driver’s License</td>
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</tbody>
</table>

**SUB-TOTAL** 38-39

### GENERAL EDUCATION REQUIREMENTS

General Education Requirements 6
(see page 42-43)

Must Include:
- Three credit hours from Area 1. Oral & Written Communication 3
  AND
- Three credit hours from Area 5. Technical Literacy 3

May Not Include:
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 6
GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
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<tr>
<td><strong>SUB-TOTAL</strong></td>
<td></td>
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</tbody>
</table>

It is a graduation requirement of the Heavy Equipment Operations (HEO) one-year certificate for students to earn a grade of “C” or better in all “Core Curriculum” courses; due to state licensing requirements, students must earn a grade of “B” or better in the CDL class.

PROGRAM TOTAL 45-46

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>HEO 100</td>
<td>First Aid and Safety</td>
</tr>
<tr>
<td></td>
<td>This course is designed to introduce students to the possible safety hazards associated with working around heavy equipment. Students will become familiar with procedures sanctioned by the American Red Cross and receive training in the identification of emergency situations and safe performance of common construction applications. 1 credit hour.</td>
</tr>
<tr>
<td>HEO 102</td>
<td>Basics of Heavy Equipment Operation</td>
</tr>
<tr>
<td></td>
<td>This course is designed to give the student a basic understanding of basic tools and blueprints used in the construction trade. 1 credit hour.</td>
</tr>
<tr>
<td>HEO 105</td>
<td>Orientation to the Trade</td>
</tr>
<tr>
<td></td>
<td>This course introduces students to the different aspects and requirements for the heavy equipment operations trade as well as educates the student in the proper identification of the various types of equipment used in the industry. 1 credit hour.</td>
</tr>
<tr>
<td>HEO 106</td>
<td>Introduction to Heavy Equipment Operations</td>
</tr>
<tr>
<td></td>
<td>This course introduces students to the identification, use, and application of heavy equipment including bulldozers, scrapers, excavators, and loaders. Students are provided a broad introduction to the processes of planning and executing earth moving activities on various types of construction projects. 1 credit hour.</td>
</tr>
<tr>
<td>HEO 108</td>
<td>Introduction to OSHA Regulations</td>
</tr>
<tr>
<td></td>
<td>This course provides the required industry training that meets the Occupational Safety &amp; Health Administration (OSHA) 10 hour safety training regulation. The areas of required studies are Introduction to OSHA, General Safety and Health, Personal Protective Equipment, Electrical Safety, Fall Protection, Cranes, Confined Space Entry, Excavations, Stairways and Ladders, Hand and Power Tools, and Motor Vehicles. To complete this course and receive the OSHA 10 hour certification card, the student must pass the OSHA written exam. 1 credit hour.</td>
</tr>
<tr>
<td>HEO 121</td>
<td>Environmental Compliance</td>
</tr>
<tr>
<td></td>
<td>This course provides an introduction to the various federal and state laws which govern the construction industry, followed by more in-depth learning about the specific issues students are likely to encounter as heavy equipment operators. Students will gain an awareness of topics ranging from solid and hazardous waste management, to water and air quality, to cultural resources, endangered species, and specifics of regulations related to demolition and earthmoving that are common to the industry. 1 credit hour.</td>
</tr>
<tr>
<td>HEO 122</td>
<td>Applied Measurements in Construction</td>
</tr>
<tr>
<td></td>
<td>This course teaches practical mathematics with applications that apply to the horizontal construction industry. Topics include reading an engineer's scale, conversions of decimals to fractions and percentages, and basic calculations for earth work quantities. Methods and practice in calculating the areas and volumes of various geometric shapes as well as formulas and methods used to calculate cut and fill requirements on a job are also covered. 3 credit hours.</td>
</tr>
<tr>
<td>HEO 131</td>
<td>Heavy Equipment Operations Internship</td>
</tr>
<tr>
<td></td>
<td>The Heavy Equipment Operations Internship is comprised of on-the-job training provided by employers on actual construction sites. A training agreement specifies the tasks the student will be expected to perform. Prerequisites: Earn a grade of “C” or better in all “Core Curriculum” courses, a grade of “D” or better in all General Education Requirement courses, pass the exit exam, and obtain the approval of their advisor. 3 credit hours.</td>
</tr>
</tbody>
</table>
HEO 134  **Safety and Loss Control.** This course provides classroom instruction on the responsibilities of the finish operator and how these responsibilities affect financial losses due to safety and operation decisions. The student is introduced to basic skills for the finish operator covering basic project planning and scheduling techniques as well as coordination and communication of work assignments to heavy equipment operators and other trades and crafts. This course also describes project setup, materials purchasing, effects of soil testing, and primary safety programs. Prerequisites: HEO 100, HEO 102, HEO 105, and HEO 106 with a grade of “C” or better. 3 credit hours.

HEO 138  **Advanced Operating Techniques.** This course teaches advanced topics for equipment operators including safety, controlling and working around water, calculating costs, and the effects of different soil types. Prerequisite: HEO 134 with a grade of “C” or better. 1 credit hour.

HEO 139  **Grade Operations.** This course provides the student with details about the staking and grading operations of construction projects. It addresses staking requirements for roads, commercial buildings, and trenches. Students are trained to read and interpret various plan sheets that contain grading information. 2 credit hours.

HEO 145  **Directional Boring.** This course introduces basic identification of directional boring machine components, safety, use of operators manuals, daily servicing, and operation of the machine. Students learn the correct procedure to start, move, and shut down the machine. Students will operate a directional boring machine to perform specific tasks in class and/or on-the-job. Prerequisites: Earn a grade of "C" or better in all "Core Curriculum" courses, a grade of "D" or better in all General Education Requirement courses, pass the exit exam, and obtain the approval of their advisor. 4 credit hours.

HEO 146  **Backhoe and Excavator.** This course introduces basic identification of components, backhoe and excavator safety, use of operators manual, daily servicing and operation of the machine teaching students to start the machine, move it, and shut it down. Included are basic backhoe and excavator operation and maintenance so that students will operate a backhoe and excavator to perform specific tasks. 4 credit hours.

HEO 147  **Dozer, Scraper, and Compaction Equipment.** This course teaches operation, maintenance, and component identification of dozers, scrapers, and compactors. Students learn how to operate this equipment to perform specific tasks. This course also covers the use of operators manuals and daily servicing of these machines. 4 credit hours.

HEO 148  **Loader.** The student will be introduced to the practical operation of a front end loader to perform specific tasks, basic loader operation and maintenance. Students will also be introduced to basic identification of components, front-end loader safety, use of operators manual, daily servicing and operation of the machine to the point where the students can start the machine, move it, and shut it down. Operation of a front end loader to perform specific tasks will be taught. 4 credit hours.

HEO 149  **Motor Grader and Skid Steer.** This course will introduce basic machine operation and maintenance including identification of components, safety, use of operators manuals, daily servicing and operation of the machine to the point where the student can start the machine, move it, and shut it down. The student will also operate a motor grader and skid steer loader to perform specific tasks. 4 credit hours.

HEO 150  **Commercial Driver License.** The Commercial Driver’s License (CDL) course is a professional course focused on the fundamentals of safe driving practices and identifying the hazards of a Class “A” Commercial Motor Vehicle (CMV). The student will be able to inspect a commercial motor vehicle, perform basic maneuver skills, and display safe on-road skills on public streets and highways. Prerequisite: Instructor’s permission based on verification of: 1) driving record that is eligible for a Missouri Class A CDL, 2) complete, current, and valid Medical Examination Report and Certificate for Commercial Driver Fitness Determination, and 3) successful drug screen(s). 4 credit hours.
HEO 151  **Basic Commercial Driver License.** This lecture course is a professional course that teaches the fundamentals of safe driving practices and identifying the hazards of a Class “A” Commercial Motor Vehicle. Students are prepared to take the written and pre-trip inspection portions of the Missouri Department Motor Vehicle Commercial Driver License (CDL) exam. This course is intended for non-HEO majors. Prerequisite: Instructor’s permission based on verification of: 1) driving record that is eligible for a Missouri Class A CDL, 2) complete, current, and valid Medical Examination Report and Certificate for Commercial Driver Fitness Determination, and 3) successful drug screen(s). 1 credit hour.

HEO 152  **Basic Commercial Driver License Lab.** The Commercial Driver License (CDL) lab teaches Commercial Motor Vehicle (CMV) pre-trip inspection requirements, basic maneuver skills, safe on-road skills that are performed on public streets and highways. This course is intended for non-HEO majors. Corequisite: HEO 151. Note: Each student will be required to have a Class A CDL permit for the driving portion of this class and maintain eligibility to take the Missouri Class A CDL examination. 1 credit hour.

HEO 299  **Special Topics in Heavy Equipment Operations.** Special Topics in Heavy Equipment Operations (HEO) may include instruction on topics not covered in other HEO courses. Topics covered in other HEO courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
HEAVY EQUIPMENT TECHNOLOGY

Classification of Instructional Programs - 47.0302

Associate of Applied Science Degree

General Option

The Heavy Equipment Technology program prepares students to perform maintenance, troubleshooting, and rebuilding of the major components of earth moving equipment. Instruction is provided in the classroom on theory, inspection, maintenance, troubleshooting, and repair of tracks, wheels, brakes, operating controls, hydraulic systems, electrical circuitry, electronic and mechanical engines, and manual and power shift transmissions. Some equipment operation is included to familiarize students with the equipment they are learning to repair.

The Heavy Equipment Technology program contributes to the green economy by updating the curriculum as needed each year to introduce the latest technology used to meet Environmental Protection Agency (EPA) regulations regarding emissions control systems. Additional technology covered includes hybrid assist systems, dual-fueled engines, and the current tier level diesel engines that produce post-combustion air that is cleaner than the intake air, which positively affects the carbon footprint.

Graduates of the two-year Associate of Applied Science degree program will have the technical competencies required to be productive in an entry-level heavy equipment technician position. They can expect to find employment with construction companies, heavy equipment sales and service organizations, dealers, state highway maintenance departments, and mining companies. The Heavy Equipment Technology program is accredited by the Associated Equipment Distributors (AED) Foundation and the Association of Technology, Management, and Applied Engineering (ATMAE).

Due to industry employment requirements, students are required to earn a Class A Commercial Driver License (CDL) before graduation. The CDL training and licensing require students to: 1) maintain a driving record that is eligible for a Missouri Class A CDL, 2) obtain a complete, current, and valid Medical Examination Report and Certificate for Commercial Driver Fitness Determination, and 3) successfully pass drug screen(s).

It is a graduation requirement of the Heavy Equipment Technology (HET) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses; due to state licensing requirements, students must earn a grade of “B” or better in the CDL classes.

To view program outcome data, visit https://www.statetechmo.edu/programs/transportationtech/het/hetfacts/.

Program Mission

The mission of the Heavy Equipment Technology program is to provide students with the opportunity to develop the technical and interpersonal skills necessary to succeed in today’s Heavy Equipment Technology field.

Program Goals

The goals of the program are to provide the opportunity for students to develop:

- Electrical knowledge and skills needed to troubleshoot, repair, and maintain heavy equipment.
- Knowledge and skills including computers that are necessary to troubleshoot, repair, and maintain diesel engines.
- Knowledge and skills necessary to troubleshoot, repair, and maintain hydraulic and drive train systems as they relate to heavy equipment.
- Critical thinking skills used in troubleshooting and repair processes and demonstrate those skills.
- Oral and written communication skills needed in the diesel technician’s field.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>HET 140</td>
<td>Introduction to Heavy Equipment Service Industry</td>
<td>2</td>
</tr>
<tr>
<td>HET 141</td>
<td>Fluids and Filtration</td>
<td>3</td>
</tr>
<tr>
<td>HET 145</td>
<td>Engines I</td>
<td>3</td>
</tr>
<tr>
<td>HET 150</td>
<td>Internship I</td>
<td>2</td>
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<tr>
<td>HET 160</td>
<td>Internship II</td>
<td>3</td>
</tr>
<tr>
<td>HET 200</td>
<td>Internship III</td>
<td>3</td>
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<tr>
<td>HET 210</td>
<td>Internship IV</td>
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<tr>
<td>HET 242</td>
<td>Electrical Systems I</td>
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<td>HET 243</td>
<td>Electrical Systems II</td>
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<td>HET 244</td>
<td>Hydraulics I</td>
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<td>HET 245</td>
<td>Hydraulics II</td>
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<td>HET 246</td>
<td>Power Train I</td>
<td>3</td>
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<tr>
<td>HET 247</td>
<td>Power Train II</td>
<td>3</td>
</tr>
<tr>
<td>HET 251</td>
<td>Troubleshooting, Diagnosis, and Repair</td>
<td>4</td>
</tr>
<tr>
<td>HET 255</td>
<td>Engines II</td>
<td>3</td>
</tr>
<tr>
<td>HET 280</td>
<td>Heating and Air Conditioning</td>
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SUB-TOTAL 47

GENERAL EDUCATION REQUIREMENTS

General Education Requirements 19
(see page 42-43)
May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- NST 101 Network Fundamentals 3

SUB-TOTAL 19

PROGRAM REQUIREMENTS

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<thead>
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<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tr>
<td>WLT 128</td>
<td>Basic Welding</td>
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<tr>
<td>HEO 151</td>
<td>Basic Commercial Driver License</td>
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<tr>
<td>HEO 152</td>
<td>Basic Commercial Driver License Lab</td>
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SUB-TOTAL 5

GRADUATION REQUIREMENTS

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
</tbody>
</table>

SUB-TOTAL 1

It is a graduation requirement of the Heavy Equipment Technology (HET) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses; due to state licensing requirements, students must earn a grade of “B” or better in the CDL classes.

PROGRAM TOTAL 72

HET 140 Introduction to Heavy Equipment Service Industry. This course teaches various types of machinery, introduction of preventive maintenance, proper starting procedure and operation of equipment. Discussion of communication both internally and externally within the company structure as it relates to written documents and oral instructions. The written communication focus is on documenting repairs needed and completed as well as other documentation required within the company structure. 2 credit hours.
HET 141  **Fluids and Filtration.**  This course discusses the purpose and characteristics of the different types of fuel, oil and lubricants. Also, the coolant system and filterization are discussed and applied.  3 credit hours.

HET 145  **Engines I.**  Basic engine systems are the core components taught in this course.  Participants will learn and discuss related component operations and their specific functions pertaining to engine performance.  Activities will include engine rebuild, inspection, repair and maintenance.  3 credit hours.

HET 150  **Internship I.**  This supervised experience is required of students enrolled in the Heavy Equipment Technology General Option.  Placement is obtained through the cooperation of a participating company involved in the repair of heavy equipment.  Student's needs and objectives determine major emphasis.  Prerequisites:  HET 140, HET 141, and HET 244 with a grade of “C” or better.  2 credit hours.

HET 160  **Internship II.**  This supervised experience is required of students enrolled in the Heavy Equipment Technology General Option.  Placement is obtained through the cooperation of a participating company involved in the repair of heavy equipment.  Student's needs and objectives determine major emphasis.  Prerequisites:  HET 242 and HET 246 with a grade of “C” or better.  3 credit hours.

HET 200  **Internship III.**  This supervised experience is required of students enrolled in the Heavy Equipment Technology General Option.  Placement is obtained through the cooperation of a participating company involved in the repair of heavy equipment.  Student's needs and objectives determine major emphasis.  Prerequisites:  HET 145, HET 243 and HET 280 with a grade of “C” or better.  3 credit hours.

HET 210  **Internship IV.**  This supervised experience is required of students enrolled in the Heavy Equipment Technology General Option.  Placement is obtained through the cooperation of a participating company involved in the repair of heavy equipment.  Student's needs and objectives determine major emphasis.  Prerequisites:  HET 245 and HET 255 with a grade of “C” or better.  3 credit hours.

HET 242  **Electrical Systems I.**  This course discusses the theory of electrical components and symbols, batteries, wiring and connector maintenance, schematic readings, starting systems, charging systems, and lighting systems.  Diagnostic tooling is discussed and applied in detail.  3 credit hours.

HET 243  **Electrical Systems II.**  This course teaches the fundamentals of electronics and computers, diagnosis and repair of electronic circuits, multiplexing, and the diagnosis and repair of electronically-controlled power train systems.  Prerequisite:  HET 242 with a grade of “C” or better.  3 credit hours.

HET 244  **Hydraulics I.**  This course discusses the theory of fluid power and hydraulics.  Basic pump, motors and systems are explained.  3 credit hours.

HET 245  **Hydraulics II.**  This course describes different types of hydraulics systems, schematic reading ISO symbols, diagnostic tooling, hoses and couplings.  Testing, adjusting, and troubleshooting/diagnosis of machine hydraulic and electro-hydraulic systems.  Prerequisite:  HET 244 with a grade of “C” or better.  3 credit hours.

HET 246  **Power Train I.**  This course describes various transmission, torque converters, differentials, final drives and proper use of tooling.  3 credit hours.

HET 247  **Power Train II.**  This course teaches assembly, disassembly, rebuilding, and troubleshooting of various makes and models of power train components not covered in the previous required power train course.  Instruction is also provided on the proper maintenance, adjustment, and installation of undercarriages.  Tire and wheel maintenance procedures are included in this course.  Prerequisite:  HET 246 with a grade of “C” or better.  3 credit hours.

HET 251  **Troubleshooting, Diagnosis, and Repair.**  This course will enable the student to effectively troubleshoot and diagnose equipment and perform repairs including estimation of time and materials needed to complete the repair.  Prerequisites:  HET 140, HET 141, HET 243, HET 245, HET 255, and HET 280 with a grade of “C” or better.  Concurrent:  HET 247 with a grade of “C” or better.  4 credit hours.
HET 255  **Engines II.** This course will concentrate on advanced engine systems including fuel systems with emphasis on diesel engine components and electronic engine control including exhaust aftertreatment and United States Environmental Protection Agency (US EPA) emissions standards. Instruction includes the use of the latest computerized test equipment utilized in engine diagnostics. The course also includes instruction on mechanical and electronic governor control systems. Prerequisite: HET 145 with a grade of “C” or better. 3 credit hours.

HET 280  **Heating and Air Conditioning.** This course teaches heating and air conditioning systems used on heavy equipment. Topics and practices will include environmental safety, refrigerant recycling, recharging systems, and climate control. Students must pass the reclamation license test during the first week of class. 3 credit hours.

HET 299  **Special Topics in Heavy Equipment Technology.** Special Topics in Heavy Equipment Technology (HET) may include instruction on topics not covered in other HET courses. Topics covered in other HET courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
HEAVY EQUIPMENT TECHNOLOGY

Classification of Instructional Programs - 47.0302

Associate of Applied Science Degree
CAT Dealer Service Technician Option

This Associate of Applied Science Degree program is a college-level program that gives the student the education and skills needed to work on over 300 Caterpillar (CAT) machines and engines - including the biggest, hardest-working, most high tech equipment in the world. Paid internships at a local CAT Dealer give the student the money needed to complete the program - and the experience needed to land a great paying, challenging career. The CAT Dealer Service Technician Option is accredited by the Associated Equipment Distributors (AED) Foundation. The program is also accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

Enrollment in the CAT Dealer Service Technician Option is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions for the specific application requirements and deadline. In order to participate in the CAT Dealer Service Technician Option, each student must be sponsored by a CAT Dealer who provides four required internship experiences.

It is a requirement of the CAT Dealer Service Technician Option for students to maintain a cumulative grade point average of 3.000 on a 4.000 point grading scale to remain sponsored in the option.

To view program outcome data, visit https://www.statetechmo.edu/programs/transportationtech/cat/catfacts/.

Program Mission
The mission of the CAT Dealer Service Technician Option is to provide students with the opportunity to develop the technical skills necessary to succeed as a service technician on Caterpillar equipment and components.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Knowledge and skills needed to repair, maintain, troubleshoot and diagnose Caterpillar equipment systems.
- Critical thinking skills used in troubleshooting and diagnostics and to demonstrate these skills.
- Oral and written communication skills needed to succeed in the Caterpillar Dealer network.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAT</td>
<td>110</td>
<td>CAT Engine Fundamentals</td>
<td>4</td>
</tr>
<tr>
<td>CAT</td>
<td>111</td>
<td>Introduction to CAT Service Industry</td>
<td>2</td>
</tr>
<tr>
<td>CAT</td>
<td>150</td>
<td>Internship I</td>
<td>4</td>
</tr>
<tr>
<td>CAT</td>
<td>112</td>
<td>Fundamentals of Hydraulics</td>
<td>3</td>
</tr>
<tr>
<td>CAT</td>
<td>113</td>
<td>CAT Engine Fuel Systems</td>
<td>3</td>
</tr>
<tr>
<td>CAT</td>
<td>114</td>
<td>Fundamentals of Electrical Systems</td>
<td>3</td>
</tr>
<tr>
<td>CAT</td>
<td>151</td>
<td>Internship II</td>
<td>4</td>
</tr>
<tr>
<td>CAT</td>
<td>115</td>
<td>Air Conditioning</td>
<td>2</td>
</tr>
<tr>
<td>CAT</td>
<td>116</td>
<td>Fundamental Transmissions/Torque Converters</td>
<td>3</td>
</tr>
<tr>
<td>CAT</td>
<td>117</td>
<td>Machine Hydraulic Systems</td>
<td>3</td>
</tr>
<tr>
<td>CAT</td>
<td>250</td>
<td>Internship III</td>
<td>4</td>
</tr>
<tr>
<td>CAT</td>
<td>200</td>
<td>U/C and Final Drive</td>
<td>3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
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<td>-------------</td>
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<tr>
<td>CAT 201</td>
<td>Machine Electronic Systems</td>
<td>3</td>
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</tr>
<tr>
<td>CAT 251</td>
<td>Internship IV</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CAT 202</td>
<td>CAT Engine Performance</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>CAT 203</td>
<td>Diagnostic Testing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>CAT 204</td>
<td>Machine Specific Systems</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 53

**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements

(see page 42-43)

Must Include:
- MAT 115 College Algebra 3

May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

**PROGRAM REQUIREMENT**

<table>
<thead>
<tr>
<th>Sub-Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLT 141</td>
<td>CAT Welding</td>
<td></td>
</tr>
</tbody>
</table>

**Optional:**
- HEO 151 Basic Commercial Driver License (1)
- HEO 152 Basic Commercial Driver License Lab (1)
- PMT 196 Machining Essentials (3)

**SUB-TOTAL** 2-7

**GRADUATION REQUIREMENT**

<table>
<thead>
<tr>
<th>Sub-Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
</tbody>
</table>

**SUB-TOTAL** 1

**PROGRAM TOTAL** 75-80

**CAT 110** *CAT Engine Fundamentals.* The principles of compression ignited internal combustion engines are taught and variations in design are discussed. Caterpillar engines are used for laboratory disassembly and assembly. 4 credit hours.

**CAT 111** *Introduction to CAT Service Industry.* This course provides instruction and laboratory experience in shop safety, shop operation and how to obtain Caterpillar service information. 2 credit hours.

**CAT 112** *Fundamentals of Hydraulics.* This course is a practical study of the basic principles and components of hydraulic circuits and the application of these principles to Caterpillar competencies in the areas of servicing and maintaining hydraulic equipment. Laboratory practices include disassembly and reassembly of components and tracing circuits. 3 credit hours.

**CAT 113** *CAT Engine Fuel Systems.* This course is a study of combustion chamber design, Caterpillar fuel injection systems and diagnosing faults in fuel injection and combustion systems. 3 credit hours.

**CAT 114** *Fundamentals of Electrical Systems.* This course is designed to include electrical concepts as they apply to electrical systems. It will include the use of electrical test equipment to diagnose electrical problems found on Caterpillar equipment and engines. 3 credit hours.

**CAT 115** *Air Conditioning.* This course provides an introduction into the basic theory and principles of air conditioning as they relate to Caterpillar equipment. Use of equipment to diagnose and repair malfunctions, including repair of component parts and the charging and recharging of systems will be stressed in the laboratory. 2 credit hours.

**CAT 116** *Fundamentals of Transmissions & Torque Converters.* A study is made of the various sliding gear, hydrostatic synchromesh and power shift transmissions involving planetaries. 3 credit hours.
CAT 117  **Machine Hydraulic Systems.**  This course is designed for inspecting, testing, servicing and diagnosing Caterpillar basic hydraulic systems.  3 credit hours.

CAT 150  **Internship I.**  This supervised experience is required of students enrolled in the CAT Dealer Service Technician curriculum.  Placement is obtained through the cooperation of a CAT dealer.  Student’s needs and objectives determine major emphasis.  Prerequisite:  Department Chair approval.  4 credit hours.

CAT 151  **Internship II.**  This supervised experience is required of students enrolled in the CAT Dealer Service Technician curriculum.  Placement is obtained through the cooperation of a CAT dealer.  Student’s needs and objectives determine major emphasis.  Prerequisite:  Department Chair approval.  4 credit hours.

CAT 200  **Undercarriage and Final Drive.**  This course is a continuation of power train systems with emphasis on final drives and track systems.  3 credit hours.

CAT 201  **Machine Electronic Systems.**  This course provides the background needed to diagnose and repair the sophisticated electronics and computerized circuits found on Caterpillar equipment and engines.  Basic electronic concepts, component function and identify malfunctions and to test the systems properly.  3 credit hours.

CAT 202  **CAT Engine Performance.**  A course to provide a thorough understanding of the necessary diagnostic skills required for troubleshooting Caterpillar engines and fuel systems.  Emphasis will be placed upon knowledge and skills necessary to assure product reliability and performance.  2 credit hours.

CAT 203  **Diagnostic Testing.**  This is a course that studies the practical use of diagnostic equipment for analyzing and repairing Caterpillar machine and engine systems.  2 credit hours.

CAT 204  **Machine Specific Systems.**  This course is designed to develop knowledge and skills used to test and adjust specific Caterpillar machine systems.  4 credit hours.

CAT 250  **Internship III.**  This supervised experience is required of students enrolled in the CAT Dealer Service Technician curriculum.  Placement is obtained through the cooperation of a CAT dealer.  Student’s needs and objectives determine major emphasis.  Prerequisite:  Department Chair approval.  4 credit hours.

CAT 251  **Internship IV.**  This supervised experience is required of students enrolled in the CAT Dealer Service Technician curriculum.  Placement is obtained through the cooperation of a CAT dealer.  Student’s needs and objectives determine major emphasis.  Prerequisite:  Department Chair approval.  4 credit hours.
INDUSTRIAL ELECTRICITY

Classification of Instructional Programs - 46.0302

Associate of Applied Science Degree

Automated Controls Technician Option

Construction Option

One-Year Certificate

Electromechanical

The Industrial Electricity program prepares individuals to install, operate, maintain, and repair electrically-energized systems such as electric power wiring and industrial process control systems. The electrical field is one of the fastest growing occupations and offers relatively high earnings. Students who graduate from the program at State Technical College of Missouri are prepared for jobs in electrical construction, electrical maintenance, and/or industrial automation. Employment opportunities may be found in schools; hospitals; manufacturing; federal and state government; building complexes; and residential, commercial, and industrial construction.

Industrial Electricity Associate of Applied Science degree students may choose either the Construction Option or the Automated Controls Technician Option. An Electromechanical One-Year Certificate is also offered. These options and the certificate allow students the flexibility to choose the electrical field that best suits their individual career goals.

The program provides extensive hands-on practical education from instructors who have worked in the electrical field. Courses in electricity, residential and commercial wiring, motor controls, power distribution, blueprint reading, and general studies develop the competencies of both construction and maintenance electricians. Safety and electrical code requirements are stressed in all classes. All students receive CPR, First Aid, and Occupational Safety and Health Administration (OSHA) 10-hour training.

Students in the Construction Option develop advanced skills required of electricians through course work in industrial wiring and alternative energy systems. Students will also gain hands-on industry experience through an internship.

In the Automated Controls Technician Option, students receive instruction on Programmable Logic Controllers (PLCs), human machine interface, and robotics.

The Industrial Electricity program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

It is a graduation requirement of the Industrial Electricity (IEL) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

To view program outcome data, visit https://www.statetechno.edu/programs/industrialtech/iel/ielfacts/.

Program Mission

The mission of the Industrial Electricity program is to provide students the knowledge and technical skills required to succeed in the electrical construction, electrical maintenance, and/or industrial automation industries.
Program Goals
The goals of the program are to provide the opportunity for students to develop:
- Awareness of potential hazards and safety practices required to prevent injuries and material damage.
- Technical and critical thinking skills required to install, troubleshoot, and repair electrical and related systems in residential, commercial, and industrial settings.
- Attitudes, ethics, and communication skills that enhance the ability to secure and maintain increasingly meaningful employment in their chosen professions.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEL 105</td>
<td>Codes and Standards I</td>
<td>2</td>
</tr>
<tr>
<td>IEL 113</td>
<td>Basic Motor Controls</td>
<td>2</td>
</tr>
<tr>
<td>IEL 117</td>
<td>Circuitry Fundamentals with Lab</td>
<td>4</td>
</tr>
<tr>
<td>IEL 125</td>
<td>Codes and Standards II</td>
<td>3</td>
</tr>
<tr>
<td>IEL 130</td>
<td>Residential Wiring Theory with Lab</td>
<td>6</td>
</tr>
<tr>
<td>IEL 150</td>
<td>Blueprint Reading and Project Development</td>
<td>3</td>
</tr>
<tr>
<td>IEL 180</td>
<td>Industrial Motor Controls</td>
<td>4</td>
</tr>
<tr>
<td>IEL 200</td>
<td>Commercial Wiring Theory with Lab</td>
<td>6</td>
</tr>
<tr>
<td>IEL 211</td>
<td>Power Distribution</td>
<td>2</td>
</tr>
<tr>
<td>IEL 260</td>
<td>Motors and Generators</td>
<td>2</td>
</tr>
</tbody>
</table>

SUB-TOTAL: 34

GENERAL EDUCATION REQUIREMENTS

General Education Requirements: 19
(see page 42-43)
May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4

SUB-TOTAL: 19

PROGRAM REQUIREMENTS

Automated Controls Technician Option

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEL 256</td>
<td>Basic Programmable Logic Controllers</td>
<td>5</td>
</tr>
<tr>
<td>IEL 262</td>
<td>Mechanical and Fluid Power Transmission</td>
<td>3</td>
</tr>
<tr>
<td>IEL 277</td>
<td>Advanced Programmable Logic Controllers</td>
<td>5</td>
</tr>
<tr>
<td>IEL 285</td>
<td>Human Machine Interface and Robotic Fundamentals</td>
<td>5</td>
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SUB-TOTAL: 18

OR

Construction Option

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEL 122</td>
<td>Alternative Energy Systems</td>
<td>2</td>
</tr>
<tr>
<td>IEL 240</td>
<td>Industrial Electricity Internship I</td>
<td>6</td>
</tr>
<tr>
<td>IEL 250</td>
<td>Industrial Wiring Theory with Lab</td>
<td>6</td>
</tr>
<tr>
<td>IEL 282</td>
<td>Industrial Electricity Capstone</td>
<td>4</td>
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</table>

SUB-TOTAL: 18
It is a graduation requirement of the Industrial Electricity (IEL) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

**PROGRAM TOTAL**  
72

## INDUSTRIAL ELECTRICITY

*Classification of Instructional Programs - 46.0302*

Electromechanical One-Year Certificate

### CORE CURRICULUM

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEL</td>
<td>105 Codes and Standards I</td>
<td>2</td>
</tr>
<tr>
<td>IEL</td>
<td>113 Basic Motor Controls</td>
<td>2</td>
</tr>
<tr>
<td>IEL</td>
<td>117 Circuitry Fundamentals with Lab</td>
<td>4</td>
</tr>
<tr>
<td>IEL</td>
<td>125 Codes and Standards II</td>
<td>3</td>
</tr>
<tr>
<td>IEL</td>
<td>130 Residential Wiring Theory with Lab</td>
<td>6</td>
</tr>
<tr>
<td>IEL</td>
<td>150 Blueprint Reading and Project Development</td>
<td>3</td>
</tr>
</tbody>
</table>

**SUB-TOTAL**  
20

### GENERAL EDUCATION REQUIREMENTS

General Education Requirements  
(see page 42-43)  
Must Include:  
Three credit hours from Area 1. Oral & Written Communication  
AND  
Three credit hours from Area 5. Technical Literacy  

**SUB-TOTAL**  
6

### PROGRAM REQUIREMENT

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT</td>
<td>051 Introductory Algebra</td>
<td>4</td>
</tr>
</tbody>
</table>

**SUB-TOTAL**  
4

### GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>COM</td>
<td>125 Job Search Strategies</td>
<td>1</td>
</tr>
</tbody>
</table>

**SUB-TOTAL**  
1

It is a graduation requirement of the Industrial Electricity (IEL) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirement” courses.

**PROGRAM TOTAL**  
31

**IEL 105 Codes and Standards I.** This course begins the study of electrical industry standards with the development of terminology, then builds on students’ developing experience to form proper interpretations of the National Electrical Code (NEC) as it pertains to wiring methods. Students will earn Occupational Safety and Health Administration (OSHA) 10-hour, cardiopulmonary resuscitation (CPR), and first aid certifications. 2 credit hours.
IEL 113 Basic Motor Controls. This course introduces key concepts in electro-magnetic theory. These concepts are then developed and applied to the use of various devices commonly used in the electrical field such as coils, relays, solenoids, contactors, motor starters and their applications. Schematics are drawn and trainers are wired using the above components. Applications of AC/DC motors, switchgear control motors and switch-motors are discussed. Prerequisite: IEL 117 with a grade of “C” or better. 2 credit hours.

IEL 117 Circuitry Fundamentals with Lab. This course introduces and develops the concepts necessary for understanding the use of electrical components and circuitry. The first half of the semester is devoted to DC, the second to AC. 4 credit hours.

IEL 122 Alternative Energy Systems. This course teaches how to install and maintain alternative energy electrical equipment. Students also gain hands-on experience using electrical metering equipment and sensors, and in electrical preventive maintenance. 2 credit hours.

IEL 125 Codes and Standards II. This course familiarizes students with the National Electrical Code (NEC), Occupational Safety and Health Administration (OSHA), American National Standards Institute (ANSI), and other related codes and standards that have been established for personal safety and for safe and proper residential, commercial, and industrial electrical installations. Prerequisite: IEL 105 with a grade of “C” or better. 3 credit hours.

IEL 130 Residential Wiring Theory with Lab. This course introduces basic electrical wiring methods, simple circuits, and residential devices and their uses in the electrical trade. The National Electrical Code is integrated into all lab projects. Prerequisite: IEL 150 with a grade of “C” or better. Corequisite: IEL 113 with a grade of “C” or better. 6 credit hours.

IEL 150 Blueprint Reading and Project Development. This course is designed to develop students’ ability to draw and interpret electrical blueprints. The fundamentals of electrical wiring schematics and diagrams are covered. This course will also cover sizing, ordering, load centers, switch gears, and other electrical equipment. Students will use their designed electrical blueprints to develop job estimates. Corequisite: IEL 117 with a grade of “C” or better. 3 credit hours.

IEL 180 Industrial Motor Controls. This course will continue to build an understanding and implementation of schematic and ladder logic concepts as they apply to industrial control systems. Programmable logic and frequency drive systems will be introduced and implemented as part of hands-on training. Troubleshooting of these systems will utilize simulations and hands on device repair or replacement. Prerequisite: IEL 113 with a grade of “C” or better. 4 credit hours.

IEL 200 Commercial Wiring Theory with Lab. This course introduces commercial wiring methods and materials. Included are conduit bending and threading, flexible metal conduit, armored cable, and low voltage control. The National Electrical Code is integrated into all lab projects. Prerequisite: IEL 130 with a grade of “C” or better. 6 credit hours.

IEL 211 Power Distribution. This course teaches AC transformer fundamentals, an introduction of switchgears, a review of AC characteristics, and a familiarization of various types of AC transformers. Power transformers and various types of special purpose transformers are taught along with ratios, losses, efficiency, and engineering calculations. Single-phase and three-phase systems and various configurations of the delta and wye connections are covered. Students perform hands-on lab work with wye and delta applications. Prerequisite: IEL 113 with a grade of “C” or better. 2 credit hours.

IEL 240 Industrial Electricity Internship I. This internship is comprised of 320 hours of work experience as a construction or manufacturing electrician and must include a variety of tasks typical to that field. The student will be required to work eight hours per day for eight weeks or the equivalent. A training agreement between the employer, the student, and the college is required. The student will submit a weekly summary of tasks performed. Prerequisite: IEL 130 with a grade of “C” or better. 6 credit hours.
IEL 250 Industrial Wiring Theory with Lab. Through a combination of classroom and lab experiences, students will learn wiring methods, systems, and materials unique to industrial and large commercial electrical construction. Included are electric and hydraulic conduit bending, power conduit threading, fire alarm systems, power factor correction, and system harmonics. The National Electrical Code is integrated into all lab projects. Prerequisite: IEL 200 with a grade of “C” or better. 6 credit hours.

IEL 256 Basic Programmable Logic Controllers. This course introduces programmable control systems as they are applied in industrial processes. Topics covered include electrical safety; PLC hardware; interfacing input and output devices; interfacing electro-pneumatic devices; and programming timers, counters, and math functions. Basic programming of Allen Bradley-Rockwell Automation software and programmable components is taught. Prerequisite: IEL 113 with a grade of “C” or better. 5 credit hours.

IEL 260 Motors and Generators. This course is an overview in the theory and operation of both AC and DC motors and generators. Topics include the various types of motors and generators, the characteristics of each, theories of operation, and applications in industry. Prerequisite: IEL 113 with a grade of “C” or better. 2 credit hours.

IEL 262 Mechanical and Fluid Power Transmission. This course includes mechanical power transmission topics such as brakes, clutches, gears, chains and sprockets, couplings, shafts, and cams and bearings. Hydraulic topics include liquid properties, cylinders, motors, pumps, valves, and math for proper sizing of components. Pneumatic topics include physical principles, cylinders, motors, compressors, and control valves. Simulation of circuits will be performed before any laboratory work is done. Laboratory exercises are provided to enhance classroom topics. Prerequisite: IEL 117 with a grade of “C” or better. 3 credit hours.

IEL 277 Advanced Programmable Logic Controllers. This advanced course teaches students to design and apply programmable control systems of increased complexity. Industrial automation processes, motion control, and human machine interface (HMI) applications are included. Advanced programming of Allen Bradley-Rockwell Automation software and programmable components is taught. Prerequisite: IEL 256 with a grade of “C” or better. 5 credit hours.

IEL 282 Industrial Electricity Capstone. This course is project oriented. The students are required to design, develop, and troubleshoot a project to be constructed in the industrial electricity lab. This project will incorporate and integrate a variety of systems and issues studied during the course of the program. The project will be team based. Students will construct and wire components necessary to make the project a working machine. Students may have to improvise on some of the materials and methods needed to complete the project. Students will evaluate the final project and compose a written report as well as a wiring diagram and instructions on how to operate the finished product. 4 credit hours.

IEL 285 Human Machine Interface and Robotic Fundamentals. This course will focus on the development and integration of human machine interface (HMI) and robotic systems commonly used in conjunction with programmable logic controllers (PLCs). Industrial automation processes, motion control, HMI, and robotic applications are included. The primary focus will be the application of HMI, robotic devices, and motion control hardware to PLC systems. Prerequisite: IEL 256 with a grade of “C” or better. Corequisite: IEL 277 with a grade of “C” or better. 5 credit hours.

IEL 299 Special Topics in Industrial Electricity. Special Topics in Industrial Electricity (IEL) may include instruction on topics not covered in other IEL courses. Topics covered in other IEL courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
MEDICAL RADIOLOGIC TECHNOLOGY

Classification of Instructional Programs – 51.0911

Associate of Applied Science Degree

This program prepares students for a profession as a Radiologic Technologist and is accredited by the Joint Review Committee on Education in Radiologic Technology, 20 N. Wacker Drive, Suite 2850, Chicago, IL 60606-3182; 312-704-5300; www.jrcert.org.

The Medical Radiologic Technology program is designed to equip graduates with the necessary skills and knowledge to become competent healthcare professionals who perform diagnostic X-ray examinations in hospitals, clinics, and imaging centers. Students of the program will learn to manipulate diagnostic X-ray equipment and the technical factors that affect X-ray images. Students will participate in a minimum of 12 credit hours of clinical study at approved clinical sites. To be successful, students need effective communication skills and a solid background in science and math.

Upon successful completion of this program, students are qualified to take the American Registry of Radiologic Technologists (ARRT) certification exam to become a registered radiologic technologist. Employers, state licensing agencies, and federal regulators look at the ARRT credential as an indication that a person has met a recognized national standard in medical imaging.

Enrollment in the Medical Radiologic Technology program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions or https://www.statetechmo.edu/mrt/ for the specific application requirements, forms, and deadline.

Students who are admitted to the Medical Radiologic Technology program should be aware that they will be subject to drug screening. Criminal background checks will be required prior to clinical placement. Per Missouri law, persons who have been convicted of or pled guilty to certain felony offenses may be prohibited from holding any direct patient care positions. This could prevent placement in and completion of clinical education courses, which are required to complete the Medical Radiologic Technology Associate of Applied Science degree.

To remain enrolled in the Medical Radiologic Technology (MRT) program, a grade of “C” or better must be maintained in all MRT courses except Radiographic Procedures and Clinical Education courses in which a grade of “B” or better must be maintained.

To view program outcome data, visit https://www.statetechmo.edu/programs/healthsci/mrt/mrtfacts/.

Program Mission

The mission of the Medical Radiologic Technology program is to provide students with high quality education in order to serve patients and employers.

Program Goals

The goals of the program are to provide the opportunity for students to develop:

- Critical thinking and problem solving skills.
- Communication skills required for direct patient care.
- Entry-level technical skills in radiologic technology.
- Basic abilities, employability skills, and an appreciation for the value of lifelong learning.
- Knowledge required to take the national certification examination administered by the American Registry of Radiologic Technologists.
### CORE CURRICULUM

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<thead>
<tr>
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<td>MRT 105</td>
<td>Patient Care and Education</td>
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<td>MRT 110</td>
<td>Radiation Protection</td>
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<td>MRT 121</td>
<td>Medical Terminology I</td>
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<td>MRT 126</td>
<td>Medical Terminology II</td>
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<td>MRT 130</td>
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<td>MRT 140</td>
<td>Clinical Education I</td>
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<td>MRT 150</td>
<td>Radiation Exposures with Lab I</td>
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<td>Radiation Exposures with Lab II</td>
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<td>MRT 180</td>
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<td>MRT 190</td>
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<td>MRT 200</td>
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<td>MRT 210</td>
<td>Radiation Physics</td>
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<td>MRT 221</td>
<td>Advanced Digital Imaging</td>
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<td>MRT 231</td>
<td>Radiographic Procedures with Lab IV</td>
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<td>MRT 260</td>
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<td>MRT 270</td>
<td>Radiographic Procedures with Lab V</td>
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<td>MRT 281</td>
<td>Curriculum Review</td>
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### GENERAL EDUCATION REQUIREMENTS

General Education Requirements 19

(see page 42-43)

Must Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4

May Not Include:
- ASC 106 Human Anatomy and Physiology with Lab II 4
- MAT 119 Elementary Statistics 3
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

### PROGRAM REQUIREMENT

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**SUB-TOTAL** 4

### GRADUATION REQUIREMENT

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<td>COM 125</td>
<td>Job Search Strategies</td>
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</table>

**SUB-TOTAL** 1

**PROGRAM TOTAL** 78

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**MRT 101** Introduction to Healthcare and Radiologic Technology. This course introduces students to healthcare and the field of radiologic technology. Students will learn what to expect from a career in radiologic technology and what will be required of them as allied health professionals. Topics include a historical overview of medicine and radiology, professional organizations, radiology administration, professional ethics, medicolegal issues, and health information management. Concepts of medical imaging and equipment will also be introduced. 1 credit hour.
MRT 105 Patient Care and Education. This course introduces students to concepts in patient care. Considerations for physical and psychological needs of patients and family members are discussed. Other topics include technologist-patient communication, safety in patient transport, vital signs, immobilization techniques, care of patient medical equipment, infection control, drug administration, and administration of contrast media. 2 credit hours.

MRT 110 Radiation Protection. This course teaches students how to make informed decisions on how to protect patients and themselves from unnecessary ionizing radiation while achieving diagnostic information. 2 credit hours.

MRT 121 Medical Terminology I. This course provides fundamental instruction regarding the understanding and usage of medical terms to include pronunciations, word roots, clinical descriptions, abbreviations, and definitions in the radiologic technology field. The medical vocabulary learned in this course assists the radiologic technologist in communicating with physicians, co-workers, and patients. Prerequisites: College-level writing and reading placement scores. 2 credit hours.

MRT 126 Medical Terminology II. This course provides advanced instruction regarding the understanding and usage of medical terms to include pronunciations, word roots, clinical descriptions, abbreviations, and definitions in the radiologic technology field. The medical vocabulary learned in this course assists the radiologic technologist in communicating with physicians, co-workers, and patients. Prerequisite: MRT 121 with a grade of “C” or better. 2 credit hours.

MRT 130 Radiographic Procedures with Lab I. This course teaches the proper steps in the completion of radiographic examinations. Radiographic anatomy, radiation protection, image evaluation, and patient care skills are learned and reinforced. Chest, abdomen, and extremity examinations are the focus of this course. Corequisite: ASC 104 with a grade of “B” or better. 4 credit hours.

MRT 140 Clinical Education I. This course provides students with their first opportunity for direct patient care. Students practice the fundamental skills and knowledge learned in the classroom to date at a clinical education work site supervised by a licensed radiologic technologist. Students have the opportunity to provide hands-on patient care by correctly positioning patients, manipulating diagnostic imaging equipment, and producing quality radiographs and images. Students also develop professional behaviors related to the role of the radiologic technologist. Corequisite: MRT 130 with a grade of “B” or better. 2 credit hours.

MRT 150 Radiation Exposures with Lab I. This course introduces the fundamentals of radiographic image quality. Both conventional and digital imaging concepts will be introduced. Factors affecting image quality and the control of scatter radiation will be discussed in depth. Grid construction will be analyzed. Geometric subject factors affecting image quality will be discussed in detail. The use of computers in medical imaging will be introduced, as well as computed radiography (CR) and digital radiography (DR) imaging concepts. 2 credit hours.

MRT 155 Radiation Exposures with Lab II. This course expands upon the fundamentals of radiographic image quality taught in Radiation Exposures with Lab I. Digital imaging technique and digital display are examined in detail. Artifacts that affect image quality are also discussed in depth. Quality assurance and quality control concepts are also studied. Prerequisite: MRT 150 with a grade of “C” or better. 2 credit hours.

MRT 160 Radiographic Procedures with Lab II. This course teaches the proper steps in the completion of radiographic examinations. Radiographic anatomy, radiation protection, image evaluation, and patient care skills are learned and reinforced. Spinal and lower extremity examinations are the focus of this course. Prerequisites: MRT 130 and ASC 104 with a grade of “B” or better. 4 credit hours.

MRT 170 Clinical Education II. Students practice the skills and knowledge learned in the classroom to date at a clinical education work site supervised by a licensed radiologic technologist strengthening the connection between theory and practice. Students have the opportunity to provide hands-on patient care by correctly positioning patients, manipulating diagnostic imaging equipment, and producing quality radiographs and images. Students also develop professional behaviors related to the role of the radiologic technologist. Prerequisite: MRT 140 with a grade of “B” or better. Corequisite: MRT 160 with a grade of “B” or better. 2 credit hours.
MRT 180  **Sectional Anatomy.** This course teaches the basic anatomy and structural relationships of the brain, chest, abdomen, and pelvis when viewed in a cross-section of the anatomy. Radiographic, computed tomography, magnetic resonance, and ultrasound images are used to support the learning process. Prerequisite: ASC 106 with a grade of “B” or better. 2 credit hours.

MRT 190  **Radiographic Procedures with Lab III.** This course teaches the proper steps in the completion of radiographic examinations. Radiographic anatomy, radiation protection, image evaluation, and patient care skills are learned and reinforced. Fluoroscopy and urography examinations are the focus of this course. Prerequisites: MRT 160 and ASC 106 with a grade of “B” or better. 3 credit hours.

MRT 200  **Clinical Education III.** Students practice the skills and knowledge learned in the classroom to date at a clinical education work site supervised by a licensed radiologic technologist strengthening the connection between theory and practice. Students have the opportunity to provide hands-on patient care by correctly positioning patients, manipulating diagnostic imaging equipment, and producing quality radiographs and images. Students also develop professional behaviors related to the role of the radiologic technologist. Prerequisite: MRT 170 with a grade of “B” or better. Corequisite: MRT 190 with a grade of “B” or better. 2 credit hours.

MRT 210  **Radiation Physics.** This course is designed to teach radiologic technology students to understand the mechanics and principles of X-radiation. Atomic structure, the production and interaction of X-rays, magnetism, electricity, and the circuitry of the X-ray unit are studied. 2 credit hours.

MRT 221  **Advanced Digital Imaging.** This course is a primary study of computed and digital radiography, fluoroscopic imaging equipment, additional imaging modalities, and quality control practices. Students will develop an understanding of the components, principles, and operation of computed radiography and digital imaging systems found in diagnostic radiology. The basic principles, procedures, and equipment of computed tomography, magnetic resonance imaging, nuclear medicine, fluoroscopy, mammography, and radiation therapy are also studied. Principles of computed radiography, digital radiography, mammography, and computed tomography quality assurance and maintenance are presented. 3 credit hours.

MRT 231  **Radiographic Procedures with Lab IV.** This course teaches the proper steps in the completion of radiographic examinations. Radiographic anatomy, radiation protection, image evaluation, and patient care skills are learned and reinforced. Mobile radiography, bony thorax, and neurological examinations are the focus of this course. Prerequisite: MRT 190 with a grade of “B” or better. 3 credit hours.

MRT 240  **Clinical Education IV.** Students practice the skills and knowledge learned in the classroom to date at a clinical education work site supervised by a licensed radiologic technologist strengthening the connection between theory and practice. Students have the opportunity to provide hands-on patient care by correctly positioning patients, manipulating diagnostic imaging equipment, and producing quality radiographs and images. Students also develop professional behaviors related to the role of the radiologic technologist. Prerequisite: MRT 200 with a grade of “B” or better. Corequisite: MRT 231 with a grade of “B” or better. 3 credit hours.

MRT 251  **Radiographic Pathology.** This course teaches the various pathological conditions of the body and their impact on the radiographic process. 2 credit hours.

MRT 260  **Radiobiology.** This course teaches the student radiographer the effects of ionizing radiation in living cells and matter. Cell survival, genetic effects, somatic effects, and radiation syndromes are discussed in detail and correlated to radiation safety practices and protection standards. 2 credit hours.

MRT 270  **Radiographic Procedures with Lab V.** This course teaches the proper steps in the completion of radiographic examinations. Radiographic anatomy, radiation protection, image evaluation, and patient care skills are learned and reinforced. Neurological exams and specialty fluoroscopic examinations are the focus of this course. Prerequisite: MRT 231 with a grade of “B” or better. 2 credit hours.
MRT 281  Curriculum Review. This is a preparatory course for the American Registry of Radiologic Technologists Examination. Practice tests and test question analysis will be completed for each subject taught in the program. Prerequisites: MRT 101, MRT 105, MRT 110, MRT 126, MRT 155, MRT 180, MRT 210, MRT 221 with a grade of “C” or better and ASC 106 with a grade of “B” or better. Corequisites: MRT 251 and MRT 260 with a grade of “C” or better and MRT 270 and MRT 290 with a grade of “B” or better. 2 credit hours.

MRT 290  Clinical Education V. Students practice the skills and knowledge learned in the classroom to date at a clinical education work site supervised by a licensed radiologic technologist strengthening the connection between theory and practice. Students have the opportunity to provide hands-on patient care by correctly positioning patients, manipulating diagnostic imaging equipment, and producing quality radiographs and images. Students also develop professional behaviors related to the role of the radiologic technologist. Prerequisite: MRT 240 with a grade of “B” or better. Corequisite: MRT 270 with a grade of “B” or better. 3 credit hours.
MEDIUM/HEAVY TRUCK TECHNOLOGY

Classification of Instructional Programs - 47.0613

Associate of Applied Science Degree

The Associate of Applied Science degree program in Medium/Heavy Truck Technology is designed to prepare skilled technicians to service medium and heavy duty trucks and similar diesel equipment. The Medium/Heavy Truck Technology program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

The Medium/Heavy Truck Technology program contributes to the green economy by updating the curriculum as needed each year to introduce the latest technology used to meet Environmental Protection Agency (EPA) regulations regarding emission and control systems. Additional technology being developed includes hybrid powertrain systems, dual-fueled engines, and Post-2007 diesel engines that produces post-combustion air that is cleaner than the intake air, which positively affects the carbon footprint.

Graduates of the program can expect to find employment in the service department of trucking companies, independent garages, truck dealerships, and construction companies. They can also expect to earn competitive wages after reaching the level of a skilled technician. Entry-level graduates usually earn from 50 to 70 percent of skilled technician rate.

Due to industry employment requirements, students are required to earn a Class A Commercial Driver License (CDL) before graduation. The CDL training and licensing require students to: 1) maintain a driving record that is eligible for a Missouri Class A CDL, 2) obtain a complete, current, and valid Medical Examination Report and Certificate for Commercial Driver Fitness Determination, and 3) successfully pass drug screen(s).

It is a graduation requirement of the Medium/Heavy Truck Technology (MHT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses; due to state licensing requirements, students must earn a grade of “B” or better in the CDL classes.

To view program outcome data, visit https://www.statetechmo.edu/programs/transportationtech/mht/mhtfacts/.

Program Mission

The mission of the Medium/Heavy Truck Technology program is to provide students with the opportunity to develop the technical and interpersonal skills necessary to succeed in today’s truck repair industry field.

Program Goals

The goals of the program are to provide the opportunity for students to develop:

- Electrical knowledge and skills needed to troubleshoot, repair, and maintain medium and heavy trucks.
- Knowledge and skills necessary to troubleshoot, repair, and maintain diesel engines.
- Knowledge and skills necessary to troubleshoot, repair, and maintain hydraulic and drive train systems as they relate to the medium/heavy duty truck field.
- Critical thinking skills used in troubleshooting and demonstrate those skills.
- Oral, analytical, mathematical, and written communication skills needed in the diesel technician’s field.
CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>MHT 102</td>
<td>Internship</td>
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<tr>
<td>MHT 130</td>
<td>Electrical and Electronic Systems</td>
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<tr>
<td>MHT 145</td>
<td>Engines I</td>
<td>3</td>
</tr>
<tr>
<td>MHT 160</td>
<td>Preventive Maintenance Inspection</td>
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<tr>
<td>MHT 170</td>
<td>Electrical and Electronic Systems II</td>
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</tr>
<tr>
<td>MHT 200</td>
<td>Suspension and Steering</td>
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</tr>
<tr>
<td>MHT 210</td>
<td>Brakes</td>
<td>3</td>
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<tr>
<td>MHT 242</td>
<td>Drive Train I</td>
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<tr>
<td>MHT 244</td>
<td>Hydraulics Fundamentals</td>
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<td>MHT 246</td>
<td>Drive Train II</td>
<td>3</td>
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<tr>
<td>MHT 252</td>
<td>Job Estimating, Troubleshooting, and Diagnostics</td>
<td>3</td>
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<tr>
<td>MHT 255</td>
<td>Engines II</td>
<td>3</td>
</tr>
<tr>
<td>MHT 280</td>
<td>Heating and Air Conditioning</td>
<td>3</td>
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<tr>
<td>MHT 290</td>
<td>Basic Truck/Automotive Shop Management</td>
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GENERAL EDUCATION REQUIREMENTS

General Education Requirements 19
(see page 42-43)
May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- MAT 119 Elementary Statistics 3
- NST 101 Network Fundamentals 3

SUB-TOTAL 19

PROGRAM REQUIREMENTS

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It is a graduation requirement of the Medium/Heavy Truck Technology (MHT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses; due to state licensing requirements, students must earn a grade of “B” or better in the CDL classes.

PROGRAM TOTAL 72

MHT 102 Internship. Training is provided by a skilled mentor or journeyman technician at a truck service center or repair shop under a training agreement with the Medium/Heavy Truck Technology program and training station. Prerequisites: MHT 160, MHT 170, MHT 210, MHT 255, and MHT 280 with a grade of “C” or better. 8 credit hours.

MHT 130 Electrical and Electronic Systems. A study of the basic principles of magnetism and electricity, basic circuitry and the use of test equipment. Electrical accessories, electronic controls and computers are included. Included in this course is schematic and ISO symbol reading. 3 credit hours.
MHT 145  **Engines I.** Basic engine systems are the core components taught in this course. Participants will learn and discuss related component operations and their specific functions pertaining to engine performance. Activities will include engine rebuild, inspection, repair and maintenance. 3 credit hours.

MHT 160  **Preventive Maintenance Inspection.** A study of the procedures used to service all of the systems of trucks. This course provides extensive training in these systems: intake, exhaust, fuel and power train. 3 credit hours.

MHT 170  **Electrical and Electronic Systems II.** This course is a continuation of electrical and electronics found on today’s medium and heavy duty trucks. Included will be discussions pertaining to diesel computer systems and multiplexing. Laboratory exercises will include the use of test equipment to identify malfunctions, determine root cause, and correct the malfunction of electronic circuits. Prerequisite: MHT 130 with a grade of “C” or better. 3 credit hours.

MHT 200  **Suspension and Steering.** This course provides a study of various types of steering systems and the advantages of each. Operating principles, testing and repair of power steering and alignment are discussed and practiced. 3 credit hours.

MHT 210  **Brakes.** This course covers braking systems used in trucks, tractors, and trailers. Diagnosis and troubleshooting of the air and hydraulic systems are included. Adjustments to service and parking brake systems will be performed. 3 credit hours.

MHT 242  **Drive Train I.** This course teaches drive train service, operation, and safety. The principles and operation of clutches and torque convertor coupling systems and standard transmission service and repair are emphasized. 3 credit hours.

MHT 244  **Hydraulics Fundamentals.** This course teaches the theory of fluid power and hydraulics. Basic pump, motors, and systems are explained. 3 credit hours.

MHT 246  **Drive Train II.** This course teaches drive train service, operation, and safety. The principles and operation of automated transmissions and drive shaft assemblies are emphasized. Heavy duty truck axle service and repair are also included. Prerequisite: MHT 242 with a grade of “C” or better. 3 credit hours.

MHT 252  **Job Estimating, Troubleshooting, and Diagnostics.** This course teaches students to estimate jobs, diagnose equipment, and perform required repairs. 3 credit hours.

MHT 255  **Engines II.** This course will concentrate on advanced engine systems including starting and fuel with emphasis on diesel engine components and electronic engine control. Instruction includes the use of the latest computerized test equipment utilized in engine diagnostics. The course also includes instruction on mechanical and electronic governor control systems. Prerequisite: MHT 145 with a grade of “C” or better. 3 credit hours.

MHT 280  **Heating and Air Conditioning.** Heating and air conditioning systems used on medium and heavy duty trucks. Topics and practices will include environmental safety, refrigerant recycling, recharging systems and climate control. (Must pass the reclamation license test during the first week of class) 3 credit hours.

MHT 290  **Basic Truck/Automotive Shop Management.** This course provides an introduction to management principles and supervisory skills. Personnel policies and work procedures commonly found in truck service centers are reviewed. Topics discussed are: keeping accurate records, writing repair orders and handling customer relations. 3 credit hours.

MHT 299  **Special Topics in Medium/Heavy Truck Technology.** Special Topics in Medium/Heavy Truck Technology (MHT) may include instruction on topics not covered in other MHT courses. Topics covered in other MHT courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.

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The Networking Systems Technology program is certified as a Cisco Academy and accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

The program curriculum focuses on networking and digital communications from an industry perspective. As the world continues to operate in the age of information technology, the demands on current network and communication infrastructures require a technically-savvy workforce - technicians that can design or redesign networks and deploy new technologies while maintaining system integrity and network security.

The program educates students to be job-ready in various areas of information technology (IT). These areas include hardware and software support, network infrastructure, systems and server administration, network and cyber security, wireless management, network engineering, and IT project management. Cisco Certified Network Associate (CCNA) curriculum, virtualization fundamentals, and Voice over Internet Protocol (VoIP) concepts are also included in the program. Students with the goal to work in digital communications can elect to take a fiber optic technology course that is certified by the Fiber Optic Association.

A graduate of the Networking Systems Technology program will have the skills to work in careers including IT support, local area networking (LAN) and wide area networking (WAN) management, systems or network administration, digital communications, and security analysis.

It is a graduation requirement of the Networking Systems Technology (NST) program for students to earn a grade of “C” or better in all “Core Curriculum” courses. Students are also required to pass one industry certification prior to graduation. Students choose from certifications that are specific to the curriculum and approved by industry advisors.

To view program outcome data, visit https://www.statetechmo.edu/programs/computertech/nst/nstfacts/.

Program Mission
The mission of the Networking Systems Technology program is to provide students with the technical and interpersonal skills needed to enter the field of computer networking or digital communications.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Oral and written communication skills.
- Analytical approaches to problem solving.
- Network administrator skills required in business, government, and/or education.
- Project management skills.
- Advanced network administrator skills to plan, install and test the implementation, and/or upgrade of digital communications systems.
**CORE CURRICULUM**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NST 103</td>
<td>Fundamentals of Voice and Data Cabling</td>
<td>3</td>
</tr>
<tr>
<td>NST 105</td>
<td>System Maintenance</td>
<td>3</td>
</tr>
<tr>
<td>NST 115</td>
<td>Operating Platforms</td>
<td>3</td>
</tr>
<tr>
<td>NST 131</td>
<td>Routing and Switching Essentials</td>
<td>3</td>
</tr>
<tr>
<td>NST 139</td>
<td>Wireless Technology</td>
<td>3</td>
</tr>
<tr>
<td>NST 180</td>
<td>Internship I</td>
<td>4</td>
</tr>
<tr>
<td>NST 185</td>
<td>Internship II</td>
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</tr>
<tr>
<td>OR</td>
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<td></td>
</tr>
<tr>
<td>NST 203</td>
<td>Enterprise Networking</td>
<td>3</td>
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<tr>
<td>NST 205</td>
<td>Linux Administration and Installation</td>
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<td>NST 210</td>
<td>Microsoft Network Administration</td>
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<td>NST 292</td>
<td>Fundamentals of Network Security</td>
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<tr>
<td>NST/CPP</td>
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<td>BUS 260</td>
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**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements 19
(see page 42-43)
Must Include:
NST 101 Network Fundamentals 3
May Not Include:
ASC 104 Human Anatomy and Physiology with Lab I 4
ASC 106 Human Anatomy and Physiology with Lab II 4

SUB-TOTAL 19

**PROGRAM REQUIREMENT**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tr>
<td>COM 211</td>
<td>Technical Writing</td>
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<td>OR</td>
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<tr>
<td>COM 102</td>
<td>English Composition II: Writing the Research Paper</td>
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**GRADUATION REQUIREMENTS**

<table>
<thead>
<tr>
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<th>Credit Hours</th>
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<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
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It is a graduation requirement of the Networking Systems Technology (NST) program for students to earn a grade of “C” or better in all “Core Curriculum” courses and pass an industry certification.

**PROGRAM TOTAL** 69-72
# Networking Systems Technology

*Classification of Instructional Programs – 11.0901*

One-Year Certificate

## Core Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>NST 103</td>
<td>Fundamentals of Voice and Data Cabling</td>
<td>3</td>
</tr>
<tr>
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<td>System Maintenance</td>
<td>3</td>
</tr>
<tr>
<td>NST 115</td>
<td>Operating Platforms</td>
<td>3</td>
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<tr>
<td>NST 131</td>
<td>Routing and Switching Essentials</td>
<td>3</td>
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</table>

**SUB-TOTAL:** 12

## General Education Requirements

General Education Requirements (see page 42-43)

Must Include:

- Three credit hours from Area 1. Oral & Written Communication
- NST 101 Network Fundamentals

**SUB-TOTAL:** 6

## Program Requirements

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>NST Elective</td>
<td>Networking Systems Technology Elective</td>
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<td>NST Elective</td>
<td>Networking Systems Technology Elective</td>
<td>3</td>
</tr>
<tr>
<td>NST Elective</td>
<td>Networking Systems Technology Elective</td>
<td>3</td>
</tr>
<tr>
<td>CPP Elective</td>
<td>Computer Application Development Elective</td>
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<tr>
<td>MAT 071</td>
<td>Intermediate Algebra</td>
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**SUB-TOTAL:** 16

## Graduation Requirements

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<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
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</table>

**SUB-TOTAL:** 1

It is a graduation requirement of the Networking Systems Technology (NST) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

## Program Total

35

**NST 101** Network Fundamentals. This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of Internet Protocol (IP) addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the Cisco curriculum. 3 credit hours.

**NST 103** Fundamentals of Voice and Data Cabling. This course, sponsored by Panduit, is designed for students interested in the physical aspects of voice and data network cabling and installation. The course focuses on cabling issues related to data and voice connections and provides an understanding of the industry and its worldwide standards, types of media and cabling, physical and logical networks, as well as signal transmission. Students will develop skills in reading network design documentation, part list set up and purchase, pulling and mounting cable, cable management, choosing wiring closets and patch panel installation and termination as well as installing jacks and cable testing. This hands-on, lab-oriented course stresses documentation, design, and installation issues, as well as laboratory safety, on-the-job safety, and working effectively in group environments. This course will help prepare students for the BICSI Registered Certified Installer, Level 1 exam. 3 credit hours.
NST 105 System Maintenance. This course covers the diagnosis, troubleshooting, and maintenance of computer components. Topics include hardware compatibility, system architecture, memory, input devices, video displays, disk drives, modems and printers. 3 credit hours.

NST 115 Operating Platforms. Course covers popular Operating Systems. Use and installation is covered for each operating system. 3 credit hours.

NST 131 Routing and Switching Essentials. This course covers the architecture, components, and operations of routers and switches in small networks and introduces wireless local area networks (WLAN) and security concepts. Students learn how to configure and troubleshoot routers and switches for advanced functionality using security best practices. Students also learn to resolve common issues with protocols in both Internet Protocol version 4 (IPv4) and version 6 (IPv6) networks. Prerequisite: NST 101 with a grade of “C” or better. 3 credit hours.

NST 139 Wireless Technology. This course defines the fundamentals of standards-based technology, giving the student an overview of the design, communication, hardware components, and maintenance associated with wireless local area network (WLAN) technology, commonly referred to as Wi-Fi. Design, deployment, and management of enterprise and broadband wireless installations will be covered. Corequisite: NST 131 with a grade of “C” or better. 3 credit hours.

NST 180 Internship I. A networking internship is comprised of work experience in a networking setting which requires the student to perform a variety of tasks. Internship sites must be approved by the department. Prerequisite: Chair approval. 4 credit hours.

NST 185 Internship II. A networking internship is comprised of work experience in a networking setting which requires the student to perform a variety of tasks. Internship sites must be approved by the department. Prerequisite: Chair approval. 4 credit hours.

NST 197 Internship III (Optional). A networking internship is comprised of work experience in a networking setting which requires the student to perform a variety of tasks. Internship sites must be approved by the department. Prerequisites: NST 180 and NST 185 or Chair approval. 4 credit hours.

NST 203 Enterprise Networking. This course describes the architecture, components, operations, and security to scale for large, complex networks, including wide area network (WAN) technologies. The course emphasizes network security concepts and introduces network virtualization and automation. Students learn how to configure, troubleshoot, and secure enterprise network devices and understand how application programming interfaces (API) and configuration management tools enable network automation. Prerequisite: NST 101 with a grade of “C” or better. 3 credit hours.

NST 205 Linux Administration and Installation. This course takes students through the process of learning Linux. Students will become familiar with the tools and processes relating to installing and administering a Linux system. 3 credit hours.

NST 207 Internship IV (Optional). A networking internship is comprised of work experience in a networking setting which requires the student to perform a variety of tasks. Internship sites must be approved by the department. Prerequisites: NST 180, NST 185, and NST 197 or Chair approval. 4 credit hours.

NST 210 Microsoft Network Administration. This course is an introduction to using Windows Server with Active Directory. Emphasis is placed on installation, configuration, and implementation of a functional Windows Server. 3 credit hours.

NST 235 Fiber Optic Technology. This course will provide instruction in fiber optic technology including theory, safety, installation, splicing and testing techniques. Upon successful completion the student may receive Fiber Optic Technician Certification from The Fiber Optic Association. Prerequisite: NST 103. 3 credit hours.
**NST 252 CompTIA Network+**. This course serves as a general introduction for students to acquire a foundation in current network technologies for local area networks (LANs), wide area networks (WANs), and the Internet. It provides an introduction to the hardware, software, terminology, components, design, and connections of a network, as well as the topologies and protocols for LANs. It covers LAN-user concepts and basic functions of system administration and operation. The course uses a combination of lectures, demonstrations, discussions, and hands-on labs. This course provides information necessary to pass the CompTIA Network+ exam. The course is also intended for those who will support or administer networks. Prerequisite: NST 105. 3 credit hours.

**NST 271 Business Communications Systems**. The lecture portion of this course will cover the basic hardware components, the software system, and the applications and capabilities of digital business communications systems. The hands-on portion will allow the students to install and test various business systems. Prerequisite: NST 105. 3 credit hours.

**NST 292 Fundamentals of Network Security**. Cisco Certified Network Associate (CCNA) Security is a hands-on, career-oriented e-learning solution with an emphasis on practical experience to help students develop specialized security skills to advance their careers. The curriculum helps prepare students for entry-level security career opportunities implementing Cisco IOS Network Security technologies. Prerequisite: NST 203 with a grade of “C” or better. 6 credit hours.

**NST 299 Special Topics in Networking Systems Technology**. Special Topics in Networking Systems Technology (NST) may include instruction on topics not covered in other NST courses. Topics covered in other NST courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
NUCLEAR TECHNOLOGY
Classification of Instructional Programs - 41.0205

Associate of Applied Science Degree
Instrumentation and Control Option
Radiation Protection Option
Reactor Operations Option

The Nuclear Technology program offers the student a unique opportunity to obtain state-of-the-art education that will put the graduate in demand by any organization or business that operates nuclear reactors or handles radioactive substances to include advanced manufacturing, life sciences, healthcare, research reactors, the nuclear power industry, hazardous waste removal companies, and government agencies. Technicians with the educational background this program provides are in high demand now, and with the rising use of radiation in diagnostics, medical treatment and applications, and potential expansion of nuclear power technology, this demand will remain high for years to come. Nuclear power is the largest non-carbon source of electricity in the United States providing 20% of the country’s power. Job placement prospects are highly favorable and starting salaries reflect this high demand.

The Associate of Applied Science degree program is the only one of its kind in Missouri and one of only a handful in the nation. It was developed cooperatively with the University of Missouri Research Reactor, the University of Missouri Nuclear Science and Engineering Institute, Ameren Missouri Callaway Energy Center, and Exelon Nuclear Corporation, all leaders in the nuclear industry. The Radiation Protection and Reactor Operations Options are accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

Enrollment in the Nuclear Technology program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions for the specific application requirements and deadline.

The core curriculum is designed to follow training requirement guidelines established by the Nuclear Uniform Curriculum Program (NUCP) and supported by Nuclear Energy Institute (NEI), the Institute of Nuclear Power Operations (INPO), and many nuclear utility companies. The curriculum is aligned with the objectives of the INPO National Academy for Nuclear Training (NANT) document and the ACAD 08-006 Uniform Curriculum Guide for Technician, Maintenance, and Nonlicensed Operations Personnel Associate Degree Programs. The curriculum also provides students with the opportunity to become qualified in nuclear radiation protection industry Standardized Task Evaluations.

The program currently includes three degree options: Instrumentation and Control, Radiation Protection, and Reactor Operations. An internship at an approved company is included in the program. Additionally, Radiation Protection Option students complete a second internship to meet the requirements of the Standard Task Evaluations.

It is a graduation requirement for students in the Nuclear Technology Radiation Protection Associate of Applied Science Degree Option to pass both the Junior Radiation Protection Technician Fundamentals Exam provided by the Electric Power Research Institute and the Department of Energy Radiological Control Technician's Core Exam with an 80% or higher on both exams.

To view program outcome data, visit https://www.statetechmo.edu/programs/industrialtech/mnt/ntfacts/.
Program Mission

The mission of the Nuclear Technology program is to provide students with the opportunity to develop the technical expertise, math and analytical skills as well as the interpersonal skills and human performance behaviors required to begin successful careers as nuclear operators, maintenance technicians, radiological protection technicians, or quality control technicians.

Program Goals

The goals of the program are to provide the opportunity for students to develop:

- The ability to communicate nuclear technology related concepts effectively in both oral and written formats.
- Skills required to appraise worksite conditions requiring radiological controls.
- Plans for minimizing personnel exposure to radiation.
- Electrical and mechanical equipment troubleshooting skills.
- Skills required to evaluate changing nuclear reactor plant conditions.
- Skills required to conduct nuclear work while employing human performance tools to minimize human error and adverse operational events.
- Skills required to inspect and test nuclear plant systems, structures and components.
- Knowledge and skills aligned with National Academy for Nuclear Training.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNT 100</td>
<td>Human Performance Fundamentals</td>
<td>2</td>
</tr>
<tr>
<td>MNT 102</td>
<td>Nuclear Industry Fundamentals</td>
<td>2</td>
</tr>
<tr>
<td>MNT 104</td>
<td>Introduction to Electricity</td>
<td>4</td>
</tr>
<tr>
<td>MNT 109</td>
<td>Mechanical and Fluid Power Transmission</td>
<td>2</td>
</tr>
<tr>
<td>MNT 111</td>
<td>Basic Nuclear Theory</td>
<td>3</td>
</tr>
<tr>
<td>MNT 189</td>
<td>Reactor Plant Components</td>
<td>4</td>
</tr>
<tr>
<td>MNT 290</td>
<td>Internship</td>
<td>4</td>
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<td></td>
<td><strong>SUB-TOTAL</strong></td>
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GENERAL EDUCATION REQUIREMENTS

(see page 42-43)

Must Include:
- MAT 115 College Algebra
  - 3
- PHY 101/102 College Physics
  - 4

May Not Include:
- NST 101 Network Fundamentals
  - 3

**SUB-TOTAL**

|                  | 19 |

PROGRAM REQUIREMENTS

Instrumentation and Control Option

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tr>
<td>MNT 112</td>
<td>Introduction to Radiation Safety</td>
<td>3</td>
</tr>
<tr>
<td>MNT 119</td>
<td>Industrial Motors and Their Controls</td>
<td>4</td>
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<tr>
<td>MNT 125</td>
<td>Applied Electronics</td>
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<tr>
<td>MNT 197</td>
<td>Basic Reactor Safety, Theory, and Operations</td>
<td>4</td>
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<tr>
<td>MNT 204</td>
<td>PLC Programming</td>
<td>4</td>
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<tr>
<td>MNT 211</td>
<td>Piping and Instrumentation Drawing</td>
<td>2</td>
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<tr>
<td>MNT 218</td>
<td>Computer Interfacing</td>
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<tr>
<td>MNT 265</td>
<td>Nuclear Instrumentation and Control I</td>
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<td>MNT 269</td>
<td>Nuclear Instrumentation and Control II</td>
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 Radiation Protection Option

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<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MNT 115</td>
<td>Radiation Protection Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>MNT 116</td>
<td>Radiation Safety with Lab I</td>
<td>3</td>
</tr>
<tr>
<td>MNT 117</td>
<td>Radiation Safety with Lab II</td>
<td>4</td>
</tr>
<tr>
<td>MNT 248</td>
<td>Advanced Radiation Safety with Lab I</td>
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<td>MNT 250</td>
<td>Advanced Radiation Safety with Lab II</td>
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<td>MNT 291</td>
<td>Nuclear Internship II</td>
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<tr>
<td>MAT 119</td>
<td>Elementary Statistics</td>
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<tr>
<td>PHY 121</td>
<td>General Chemistry with Lab I</td>
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OR

 Reactor Operations Option

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<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>MNT 112</td>
<td>Introduction to Radiation Safety</td>
<td>3</td>
</tr>
<tr>
<td>MNT 118</td>
<td>Electrical Theory and Safety</td>
<td>4</td>
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<tr>
<td>MNT 197</td>
<td>Basic Reactor Safety, Theory, and Operations</td>
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</tr>
<tr>
<td>MNT 211</td>
<td>Piping and Instrumentation Drawing</td>
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<tr>
<td>MNT 270</td>
<td>Thermodynamics, Fluid Flow, and Advanced Reactor Theory</td>
<td>5</td>
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<td>MNT 274</td>
<td>Reactor Plant Systems</td>
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<tr>
<td>MNT 275</td>
<td>Nuclear Reactor Operation Fundamentals I</td>
<td>2</td>
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<td>MNT 278</td>
<td>Reactor Plant Operations</td>
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<td>MNT 279</td>
<td>Nuclear Reactor Operation Fundamentals II</td>
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<td>PHY 121</td>
<td>General Chemistry with Lab I</td>
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GRADUATION REQUIREMENT

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<td><strong>SUB-TOTAL</strong></td>
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It is a graduation requirement for students in the Nuclear Technology Radiation Protection Associate of Applied Science Degree Option to pass both the Junior Radiation Protection Technician Fundamentals Exam provided by the Electric Power Research Institute and the Department of Energy Radiological Control Technician’s Core Exam with an 80% or higher on both exams.

PROGRAM TOTAL  70-76

MNT 100  Human Performance Fundamentals. This course teaches students how to incorporate nuclear industry fundamental and conditional human performance skills in their behavior. Dynamic learning activities and simulated scenarios for each human performance tool or behavior will be utilized to develop the necessary skills to prevent unsafe conditions and adverse operational events in the workplace. Prerequisite: MNT 102 with a grade of “C” or better.  2 credit hours.

MNT 102  Nuclear Industry Fundamentals. This course includes strategies essential for success in a nuclear industry work environment. Nuclear career skills such as study techniques, test taking, time management, and stress management are discussed. Topics such as nuclear safety culture, industry regulation, reliability and trustworthiness, deliberate misconduct, employee protection, completeness and accuracy of information, and human performance error prevention tools are discussed and applied. This course also provides students with the preparation and completion of the Edison Electric Institute (EEI) nuclear industry aptitude exams as well as industry generic nuclear plant access and radiation worker training and exams. Students will be introduced to nuclear technician responsibilities and expectations.  2 credit hours.
MNT 104 Introduction to Electricity. This course introduces and develops the concepts necessary for understanding the use of electrical components and circuitry. Technical math including scientific notation, significant figures, unit conversions, beginning algebra and basic trigonometry will be introduced and developed throughout the course. The first half of the semester is devoted to DC, the second to AC. Prerequisite: Satisfactory placement score into MAT 051 or higher. 4 credit hours.

MNT 109 Mechanical and Fluid Power Transmission. This course teaches mechanical power transmission topics such as brakes, clutches, gears, couplings, shafts, chains and sprockets, cams, and bearings. Hydraulic topics covered include liquid properties, cylinders, motors, pumps, valves, and math for proper sizing of components. Pneumatic topics covered include physical principles, cylinders, motors, compressors, and control valves. 2 credit hours.

MNT 111 Basic Nuclear Theory. This course covers the atomic structure, nuclear reactions, mass to energy conversion, industrial and science applications of nuclear processes, and risk/benefit analysis. Prerequisite: MAT 051 with a grade of “C” or better, or SPM 050 with a passing grade, or satisfactory placement score into MAT 071. 3 credit hours.

MNT 112 Introduction to Radiation Safety. This course covers the radiation protection fundamentals as outlined in the Nuclear Industry Standard Process – Radiological Protection, NISP-RP-012. Standard task evaluations NISP-RP-02.01 through NISP-RP-02.10 are also covered. 3 credit hours.

MNT 115 Radiation Protection Fundamentals. This course covers radiation protection fundamentals as outlined in the Nuclear Industry Standard Process - Radiological Protection, NISP-RP-012, Training and Qualifications for Supplemental Radiation Protection Technicians. Students will also be prepared to take the Radiation Protection Fundamentals-One Electric Power Research Institute (EPRI) exam. 3 credit hours.

MNT 116 Radiation Safety with Lab I. This course will focus on the objectives of the Electric Power Research Institute (EPRI) Standard Task Evaluations: RP-02.01 - Portable Radiation Survey Instruments, RP-02.02 - Performing Radiation and Contamination Surveys, and RP-02.03 - Collect and Evaluate Radiological Air Samples. Basic protective clothing will also be covered. Prerequisite: MNT 115 with a grade of “C” or better. 3 credit hours.

MNT 117 Radiation Safety with Lab II. This course will focus on the objectives of the Electric Power Research Institute (EPRI) Standard Task Evaluations RP-02.04 - Post Low Level Radiological Hazards, RP-02.05 - Control Access into High Radiation Areas and Locked High Radiation Areas, RP-02.06 - Monitor Personnel Contamination and Unconditional Release, RP-02.07 - Control Radioactive Material Within an Radiologically Controlled Area (RCA), RP-02.08 - Use and Control High Efficiency Particulate Air (HEPA) Filtration and Vacuum Equipment, and RP-02.10 - Radiological Job Coverage. Basic protective clothing will also be covered. Prerequisite: MNT 115 with a grade of “C” or better. 4 credit hours.

MNT 118 Electrical Theory and Safety. This course teaches key concepts in electrical theory. These concepts are developed and applied to AC/DC motors, switchgears, transformers, chargers, and inverters. Electrical drawings and schematics fundamentals are covered. This course teaches the hazards associated with industrial electricity, electric power generation, safety rules, and safe work practices. Human performance tools and their uses to promote event-free operation are also discussed and utilized in detail. Prerequisite: MNT 104 with a grade of “C” or better. 4 credit hours.

MNT 119 Industrial Motors and Their Controls. This course introduces students to various types of industrial motors and controls. Students will identify, select, install, wire, and troubleshoot three-phase and single-phase DC/AC motors and controls including servo and stepper motors. Lab exercises include designing and building control modules for machine integration. Prerequisite: MNT 104 with a grade of “C” or better. 4 credit hours.

MNT 125 Applied Electronics. This course introduces and develops the concepts necessary to analyze and test both discrete and integrated circuit components. The first half of the semester is devoted to analog circuits, the second to digital electronics. Laboratory experiments support the concepts that are covered. Prerequisite: MNT 104 with a grade of “C” or better. 4 credit hours.
MNT 189 Reactor Plant Components. Introduction to basic mechanical and electrical components used by nuclear power plants such as different types of piping, valves, pumps, ejectors, filters, turbines, heat exchangers, compressors, lubrication systems, valve actuators, breakers, transformers, relays, and other equipment. Basic heat transfer, fluid flow, and plant materials theories are included in the course. 4 credit hours.

MNT 197 Basic Reactor Safety, Theory, and Operations. Introduction to the fission process, reactivity, criticality, basic reactor kinetics, heat removal, reactor types, nuclear power plant chemistry, and elementary thermodynamics. Prerequisites: MNT 111 and MNT 189 with a grade of “C” or better. 4 credit hours.

MNT 204 PLC Programming. This course includes a review of number systems, programmable logic control addressing, use of software, system control, and an in-depth study of ladder logic programming. Programming topics include: discrete and analog inputs and outputs, internal registers and tables, editing, timers, counters, comparison functions, computational functions, data move functions, subroutines, data manipulation and sequencing functions, high speed counting, trigonometric and advanced math functions. Laboratory exercises are provided to enhance classroom topics. Prerequisite: MNT 119 with a grade of “C” or better. 4 credit hours.

MNT 211 Piping and Instrumentation Drawings. Types of piping and instrumentation components, their construction and their schematics; reading of piping and electrical drawings; and lockout/tagout procedures applicable to the nuclear utility industry. Prerequisites: MNT 104 and MNT 189 with a grade of “C” or better. 2 credit hours.

MNT 218 Computer Interfacing. This course introduces the use of personal computers for data and control in an industrial environment. Applications using common personal computers, "off-the-shelf" components, and interfacing boards will be covered. Laboratory experiments designed to support computer interfacing are included. Prerequisites: MNT 119 and MNT 125 with a grade of “C” or better. 3 credit hours.

MNT 248 Advanced Radiation Safety with Lab I. This course covers practical applications and demonstrations of Common Industry Radiation Protection (CIRP) tasks that include post low level radiological hazards, controlling access to high radiation areas, monitoring for personnel contamination, controlling radioactive material within a radiological controlled area (RCA), controlling High Efficiency Particulate Air (HEPA) vacuums and ventilation equipment, and performing low risk radiological job coverage. Prerequisites: MNT 116 and MNT 117 with a grade of “C” or better. 4 credit hours.

MNT 250 Advanced Radiation Safety with Lab II. This course covers analytical applications of radiation protection and health physics including senior level Common Industry Radiation Protection (CIRP) tasks such as laboratory analysis, instrument calibration, environmental monitoring, radiography, job coverage with medium or high radiological risk, and shipment of radioactive materials. Prerequisite: MNT 248 with a grade of “C” or better. 4 credit hours.

MNT 265 Nuclear Instrumentation and Control I. Topics include principles of operation of pressure, level, flow, temperature, and radiation detection equipment. Conversion of the inputs via transmitters and transducers to master control systems is also discussed. These input values are then recorded and employ Proportional, Integral, and Derivative (PID) based algorithms to drive key outputs, signal alarms, and calculate error values. Discussion and demonstration of hydraulic, pneumatic, mechanical, and electrical signal transmission is covered in detail. Industry standard calibration techniques per Instrument Society of America (ISA) are studied and demonstrated in hands-on lab exercises. Prerequisite: MNT 189 with a grade of “C” or better. Corequisite: MNT 204 with a grade of “C” or better. 4 credit hours.

MNT 269 Nuclear Instrumentation and Control II. Topics include in-depth discussion of radiation sensors unique to power generating nuclear reactors. Control systems are discussed with particular emphasis on those found in pressurized and non-pressurized boiler systems. Advanced control theory is introduced, including feed forward and cascade control systems, which are explained and implemented in lab. Use of advanced output techniques such as time proportional control and pulse-width modulation are likewise covered and implemented to control process variables. Includes a technical lab component. Prerequisite: MNT 265 with a grade of “C” or better. 3 credit hours.
MNT 270 Thermodynamics, Fluid Flow, and Advanced Reactor Theory. Topics include properties of steam/water, advanced heat transfer, thermodynamic cycles and efficiency, heat exchanges, fuel cell heat transfer, pump theory and laws, cavitation, and erosion of piping components. Advanced reactor kinetics, heat removal, nuclear power plant chemistry, reactivity calculations, reactor plant materials, reactor sensors, and radiation detectors are also covered. Prerequisites: MNT 197 and MNT 274 with a grade of “B” or better. 5 credit hours.

MNT 274 Reactor Plant Systems. This course covers the purpose, operation, and flow paths of basic reactor systems including many of the systems in ACAD 90-016 Section 7.2. Prerequisite: MNT 189 with a grade of “B” or better. Corequisite: MNT 197. 3 credit hours.

MNT 275 Nuclear Reactor Operation Fundamentals I. This course covers the operation of the following plant components as they are applied to integrated nuclear plant operations: valves, sensors and detectors, controllers and positioners, pumps, motors and generators, heat exchangers, condensers, demineralizers, ion exchangers, breakers, relays, and disconnects. This course also includes applied topics in nuclear reactor kinetics including neutrons, neutron sources, and neutron life cycle. Prerequisites: MNT 197 and MNT 274 with a grade of “B” or better. 2 credit hours.

MNT 278 Reactor Plant Operations. This course covers reactor plant safety design and operation. Basic reactor startup, shutdown, and emergency procedures and why those procedures are written are also covered. Review of past reactor accidents and events. Includes practical laboratory that prepares the student to fulfill the role of Nuclear Equipment Operator. Laboratory will cover practical operating procedures in valve operation, breaker operation, placing equipment on and off of service, lubrication, pump operation, air compressors, diesel engines, and other equipment. Prerequisites: MNT 270 and MNT 275 with a grade of “C” or better. 4 credit hours.

MNT 279 Nuclear Reactor Operation Fundamentals II. This course covers the following topics as they are applied to integrated nuclear plant operations and thermodynamic responses in nuclear plant systems: thermodynamic units and properties, steam tables, Mollier diagrams, steam systems, thermodynamic processes and cycles, fluid statics and dynamics, heat transfer and heat exchangers, thermal hydraulics, reactor core thermal limits, brittle fracture, and vessel thermal stress. This course also includes applied topics in nuclear reactor reactivity control including reactivity coefficients, control rods, fission product poisons, fuel depletion, burnable poisons, and reactor operational physics. Prerequisites: MNT 270 and MNT 275 with a grade of “C” or better. 3 credit hours.

MNT 290 Internship. The student will serve an internship of approximately 320 hours with a company that uses nuclear technicians in radiation protection, nuclear reactor operations, nuclear reactor maintenance or quality control. The student is expected to apply learned skills and training to be a productive employee, and the employer is expected to place the student in an environment that will build on the student's first year of study and enhance the student’s knowledge of working in the nuclear industry. Prerequisites: Department Chair approval and Technical GPA of 3.000 or better required. 4 credit hours.

MNT 291 Nuclear Internship II. The student will serve an internship with a nuclear power plant to gain experience as a junior radiation protection technician. The student is expected to apply learned skills and training to be a productive employee. The employer is expected to place the student in an environment that will build on the student's knowledge and enhance the student's knowledge of working in the nuclear industry. Prerequisites: Department Chair approval and Technical GPA of 3.000 or better required. 3 credit hours.

MNT 299 Special Topics in Nuclear Technology. Special Topics in Nuclear Technology (MNT) may include instruction on topics not covered in other MNT courses. Topics covered in other MNT courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
NURSING
Classification of Instructional Programs – 51.3801

Associate of Applied Science Degree

The Associate of Applied Science Degree in Nursing prepares the licensed practical nurse (LPN) as a professional registered nurse (RN). This degree is based upon nursing and related sciences to promote, restore, and maintain the health of human beings. Critical reasoning is developed to manage complex patients in healthcare agencies and the community. Graduates of this program are generalists with the necessary academic preparation to pursue further nursing degrees and continuing professional development. The Associate of Applied Science Degree in Nursing has initial approval by the Missouri State Board of Nursing, 3605 Missouri Boulevard, Jefferson City, MO 65102; (573) 751-0293; www.pr.mo.gov.

The Associate of Applied Science Degree in Nursing is a three-semester program. Students will participate in clinicals at approved healthcare agencies that may include local hospitals, long-term care facilities, clinics, and area schools. Upon successful completion of the program and approval from the Missouri State Board of Nursing, students become eligible to take the National Council Licensure Examination for Registered Nurses (NCLEX-RN).

Enrollment in the Associate of Applied Science Degree in Nursing is limited, and students are selected for this program on a competitive basis. Contact the Office of Admissions for specific application requirements, forms, and deadline.

Students who are admitted to the Associate of Applied Science Degree in Nursing program should be aware that they will be subject to drug screening. Criminal background checks will be required prior to clinical placement. Per Missouri law, persons who have been convicted of or pled guilty to certain felony offenses may be prohibited from holding any direct patient care positions. This could prevent placement in and completion of clinical education courses, which are required to complete the Associate of Applied Science Degree in Nursing one year LPN to RN degree program.

A 75% or better must be maintained in "Core Curriculum" courses and a "C" or better in all other courses in order to continue and graduate in the Associate of Applied Science Degree in Nursing.

Please note: Students interested in continuing their education and applying for the Associate of Applied Science Degree in Nursing program in the Fall of 2021, must have a “B” or better in the sciences to be considered for admission. Contact the Office of Admissions or visit the college website for additional details.

To view program outcome data, visit https://www.statetechmo.edu/programs/healthsci/adn/adnfacts/.

Program Mission

The mission of the Associate of Applied Science Degree in Nursing program is to provide licensed practical nurses education mobility and a transition path to a professional registered nurse. The professional registered nurse contributes to comprehensive healthcare through critical reasoning in the use of the nursing process, clinical competence, quality outcomes, and patient advocacy. Partnership with the community through healthcare, governmental, and accrediting agencies to assist the program in providing learning environments in which students build upon their skills and knowledge to strengthen their understanding of local, state, and national health issues.

Program Goals

The goals of the program are to provide the opportunity for students to develop:

- Ability to transition from a Licensed Practical Nurse to a professional Registered Nurse.
- Skills to be a safe and effective practitioner as a professional Registered Nurse.
- Individual growth in their personal, professional, and community lives.
- Skills to meet the objectives of the Missouri State Board of Nursing through collaboration with peers, nursing faculty, advisory committee members, and cooperating agencies.
- Ability to assume a role as a member and manager of both the nursing and healthcare team.
• Clinical reasoning skills within the scope of the professional Registered Nurse.
• Competency in professional nursing procedures.
• Knowledge and eligibility to take the NCLEX-RN examination to become a professional Registered Nurse.
• Ability to contribute to the profession of nursing through life-long learning, safe patient management, and evidence-based practice producing quality outcomes.

**CORE CURRICULUM**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>NUR 200</td>
<td>Transition to Professional Nursing Practice</td>
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<tr>
<td>NUR 205</td>
<td>Health Assessment in Professional Nursing Practice</td>
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<tr>
<td>NUR 208</td>
<td>Health Assessment Clinical Education</td>
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</tr>
<tr>
<td>NUR 210</td>
<td>Medical Surgical Nursing in the Adult Client</td>
<td>3</td>
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<tr>
<td>NUR 215</td>
<td>Medical Surgical Nursing in the Adult Client</td>
<td>3</td>
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<tr>
<td>NUR 221</td>
<td>Mental Health Nursing</td>
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<td>NUR 226</td>
<td>Mental Health Nursing Clinical Education</td>
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<tr>
<td>NUR 230</td>
<td>Women and Child Care Nursing</td>
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<td>NUR 235</td>
<td>Women and Child Care Nursing Clinical Education</td>
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<td>NUR 240</td>
<td>Managing and Delegating Care in Professional Nursing Practice</td>
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<tr>
<td>NUR 246</td>
<td>Capstone with Nurse Leadership Application</td>
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**GENERAL EDUCATION REQUIREMENTS**

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<td>MAT 115</td>
<td>College Algebra</td>
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<tr>
<td>ASC 104</td>
<td>Human Anatomy and Physiology with Lab I</td>
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<tr>
<td>ASC 106</td>
<td>Human Anatomy and Physiology with Lab II</td>
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**PROGRAM REQUIREMENTS**

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<td>ASC 106</td>
<td>Human Anatomy and Physiology with Lab II</td>
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<tr>
<td>PSY 161</td>
<td>Health Psychology</td>
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<tr>
<td>SCI 151</td>
<td>Microbiology with Lab</td>
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**GRADUATION REQUIREMENTS**

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<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
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</table>

**PROGRAM TOTAL**

60

It is a graduation requirement of the Associate of Applied Science Degree in Nursing program for students to earn a grade of 75% or better in all “Core Curriculum” courses and a “C” or better in all other courses.
NUR 200  Transition to Professional Nursing Practice. This course focuses on the role transition of a licensed practical nurse (LPN) to that of a professional registered nurse (RN). The roles of the RN as a provider and manager of patient-centered care and as a member of the professional nurse community are emphasized. Communication skills build on previous knowledge including the use of technology. Concepts of responsibility, accountability, delegation, advocacy, and collaboration will be discussed and articulated. Students will learn to reflect and synthesize information based on ethical, legal, evidence-based practice, quality improvement, safety, financial, and cultural considerations while organizing, prioritizing, and delegating nursing care. Social and political influences on nursing practice and healthcare delivery will be explored. Prerequisites: Acceptance into the Associate of Applied Science Degree in Nursing program and ASC 104, ASC 106, PSY 161, and SCI 151 with a grade of “C” or better. 3 credit hours.

NUR 205  Health Assessment in Professional Nursing Practice. This health assessment course is designed to transition the licensed practical nurse (LPN) to the professional registered nurse (RN) role. The student will learn concepts and advanced nursing interventions including medication and intravenous management to provide safe, quality patient-centered practice in a variety of healthcare settings. Emphasis is placed on developing professional skills in assessment, implementation and evaluation of nursing interventions, technologies, and quality outcomes. Concepts build on previous knowledge to enhance professionalism and utilization of appropriate communication, documentation, life-span considerations, and evidence-based practice. Prerequisites: Acceptance into the Associate of Applied Science Degree in Nursing program and ASC 104, ASC 106, PSY 161, and SCI 151 with a grade of “C” or better. Concurrent: NUR 208. 3 credit hours.

NUR 208  Health Assessment Clinical Education. This health assessment clinical course is designed to transition the licensed practical nurse (LPN) to the professional registered nurse (RN) role. Emphasis is placed on developing professional skills in health assessment including planning care, utilizing appropriate nursing interventions, and evaluating patient outcomes. Physical assessment, infection control, patient education, nutrition, safety, advanced medication administration, and nursing skills are practiced and mastered in skills lab, simulation, and the clinical setting. Prerequisites: Acceptance into the Associate of Applied Science Degree in Nursing program and ASC 104, ASC 106, PSY 161, and SCI 151 with a grade of “C” or better. Concurrent: NUR 205. 2 credit hours.

NUR 210  Medical Surgical Nursing in the Adult Client. This didactic course transitions the licensed practical nurse (LPN) nursing knowledge and skills to that of the professional registered nurse (RN). The student will focus on the pathophysiology, nutrition, and medications related to complex medical surgical conditions. Medication administration and intravenous therapy will be emphasized. Students will expand their critical thinking and clinical reasoning skills by utilizing assessment, health data, cultural competence, and the nursing process in the application of safe, evidence-based practice, and quality nursing care. The student will gain organization, prioritization, and collaboration skills while learning to function more independently. Accountability and integrity within the ethical legal framework of entry-level registered professional nursing practice will be self-assessed while fostering a commitment to ongoing professional development. Prerequisites: Acceptance into the Associate of Applied Science Degree in Nursing program and ASC 104, ASC 106, PSY 161, SCI 151, NUR 205, and NUR 208 with a grade of “C” or better. Concurrent: NUR 215. 3 credit hours.

NUR 215  Medical Surgical Nursing in the Adult Client Clinical Education. This clinical course transitions the licensed practical nurse (LPN) nursing knowledge and skills to that of professional registered nurse (RN). Students will apply concepts of pathophysiology, nutrition, and medication knowledge related to complex medical surgical conditions. Medication administration and intravenous therapy will be emphasized. Students will demonstrate critical thinking and clinical reasoning skills in managing assessment, health data, cultural competence, and the nursing process in the application of safe, evidence-based practice and quality nursing care. Students will also utilize organization, prioritization, and collaboration skills while learning to function more independently. Accountability and integrity within the ethical legal framework of entry-level professional nursing practice will be self-assessed while fostering a commitment to ongoing professional development. Prerequisites: Acceptance into the Associate of Applied Science Degree in Nursing program and ASC 104, ASC 106, PSY 161, SCI 151, NUR 205, and NUR 208 with a grade of “C” or better. Concurrent: NUR 210. 3 credit hours.
NUR 221  Mental Health Nursing. This course focuses on the transition of the licensed practical nurse (LPN) to that of a professional registered nurse (RN) in the care of clients with mental health disorders. The physiological and psychosocial integrity of the client with a specific focus on the psychosocial aspects of mental health disorders will be explored. Consideration is given to clients’ past and present patterns of behavior as they impact on alterations of mental well-being. Communication skills are further developed using theories of interpersonal relationships. With assistance, a student learns to provide a milieu that is both safe and therapeutic. Students use the nursing process as a tool for critical thinking in organizing, prioritizing, managing individual plans of care, and collaborating with the healthcare team. Students are assisted to address ethical and legal dilemmas in their roles as client advocates. Self-assessment and self-awareness are encouraged to enhance self-development and foster therapeutic relationships with an emphasis on multicultural diversity. Prerequisites: NUR 200, NUR 205, NUR 208, NUR 210, and NUR 215 with a grade of “C” or better. Concurrent: NUR 226. 3 credit hours.

NUR 226  Mental Health Nursing Clinical Education. This clinical course focuses on the transition of the licensed practical nurse (LPN) to that of a professional registered nurse (RN) in the care of clients with mental health disorders. The physiological and psychosocial integrity of the client with a specific focus on the psychosocial aspects of mental health disorders will be explored in mental health agencies. Consideration is given to clients’ past and present patterns of behavior as they impact on alterations of mental well-being. Communication skills are further developed using theories of interpersonal relationships. The student learns to provide a milieu that is both safe and therapeutic. Students use the nursing process as a tool for critical thinking in organizing, prioritizing, managing individual plans of care, and collaborating with the healthcare team. Students are assisted to address ethical and legal dilemmas in their roles as client advocates. Self-assessment and self-awareness are encouraged to enhance self-development and foster therapeutic relationships with an emphasis on multicultural diversity. Prerequisites: NUR 200, NUR 205, NUR 208, NUR 210, and NUR 215 with a grade of “C” or better. Concurrent: NUR 221. 1 credit hour.

NUR 230  Women and Child Care Nursing. This course focuses on the transition of the licensed practical nurse (LPN) to a professional registered nurse (RN) in the care of women, infants, and children. Students apply the nursing process using the principles of critical thinking with childbearing and/or child-rearing families. Concepts of human development, family community systems, safe-protective care environment, therapeutic communication, health, education, and culturally-specific healthcare are emphasized and are applied to clients in a variety of mother-child settings. Students provide increasingly complex care, moving toward more independent practice, and increasing professional accountability. Ethical and legal issues pertaining to obstetric and infant clients are explored. Along with care in the clinical setting, an emphasis is placed on collaboration with families and members of the healthcare team as well as professional development and self-assessment. Prerequisites: NUR 200, NUR 210, and NUR 215 with a grade of “C” or better. Concurrent: NUR 235. 3 credit hours.

NUR 235  Women and Child Care Nursing Clinical Education. This clinical course focuses on the transition of the licensed practical nurse (LPN) to a professional registered nurse (RN) in the care of women, infants, and children. Students apply the nursing process using the principles of critical thinking with childbearing and/or child-rearing families. Concepts of human development, family community systems, safe-protective care environment, therapeutic communication, health, education, and culturally-specific healthcare are emphasized and are applied to clients in a variety of mother-child settings. Students provide increasingly complex care, moving toward more independent practice, and increasing professional accountability. Ethical and legal issues pertaining to obstetric and infant clients are explored. Along with care in the clinical setting, an emphasis is placed on collaboration with families and members of the healthcare team as well as professional development and self-assessment. Prerequisites: NUR 200, NUR 210, and NUR 215 with a grade of “C” or better. Concurrent: NUR 230. 2 credit hours.

NUR 240  Managing and Delegating Care in Professional Nurse Practice. This course focuses on the role transition of a licensed professional nurse (LPN) to that of a professional registered nurse (RN) as a provider and manager of patient-centered care. As a member of the professional nurse community, communication skills build on previous knowledge including the use of technology. Concepts of responsibility, accountability, delegation, advocacy, and collaboration will be discussed and articulated. Students will learn to reflect and synthesize information based on ethical, legal, evidence-based practice, quality improvement, safety, financial, patient-centered care, and cultural issues while organizing, setting priorities, and delegating nursing care. Social and political influences on managing nursing practice for self, healthcare team, institution, and community care delivery will be explored. Prerequisites: NUR 221, NUR 226, NUR 230, and NUR 235 with a grade of “C” or better. 3 credit hours.
NUR 246 Capstone with Nurse Leadership Application. This clinical capstone course focuses on the role transition of a licensed practical nurse (LPN) to that of a professional registered nurse (RN) as a provider and manager of patient-centered care. As a member of the professional nurse community, communication skills build on previous knowledge including the use of technology and collaboration. Students will select a nursing mentor to further explore nursing strategies in managing care with the assistance of the instructor. This learning experience will afford the student the opportunity to formulate objectives and goals and allows students to observe management and delegation in practice for a group of patients and nurses. Students will then reflect on the experience, write a reflective paper, and present the paper to a team of instructors and mentors who will provide feedback to the student. NCLEX-RN preparation is also included in this course. Prerequisites: NUR 221, NUR 226, NUR 230, and NUR 235 with a grade of “C” or better. 3 credit hours.
This program prepares students for a profession as a Physical Therapist Assistant. The Physical Therapist Assistant program at State Technical College of Missouri is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE), 1111 North Fairfax Street, Alexandria, Virginia 22314; telephone: 703-706-3245; email: accreditation@apta.org; website: www.capteonline.org.

The Physical Therapist Assistant (PTA) program is designed to equip the graduate with the necessary skills and training to become employed in various physical therapy settings such as hospitals, rehabilitation facilities, long term care facilities, home healthcare, clinics or school systems. The program is both physically and mentally challenging. To be successful, students should possess good communication skills and have a good background in science and math.

State Technical College of Missouri is a member of the Missouri Health Professions Consortium (MHPC) and in partnership with other member colleges is part of an initiative to expand access to physical therapist assistant education for rural Missourians. The consortium members consist of State Technical College of Missouri, East Central College, Moberly Area Community College, North Central Missouri College, State Fair Community College, Three Rivers College, and School of Health Professions-University of Missouri Health System. All two-year colleges in the MHPC offer and enroll students in the first-year general education and prerequisite coursework. The second-year professional PTA lecture and lab coursework is delivered solely by State Technical College of Missouri at the Health Science Center in Linn, MO. Instructional delivery includes traditional face-to-face and hybrid education.

Students interested in earning this degree must apply to State Technical College of Missouri to be considered for admission into the second-year professional PTA portion of the program. Students who enter the program under the “Early Admission” criteria must earn a grade of “C” or above in all required courses and maintain a 2.750 cumulative GPA in order to progress to the technical curriculum in the second year. To remain enrolled in the PTA program, students must earn a grade of “C” or above in all PTA courses including 632 clock hours of supervised internship in approved clinical facilities. Graduates of the program will earn an Associate of Applied Science degree in PTA from State Technical College of Missouri.

Enrollment in the Physical Therapist Assistant program is limited and students are selected for this program on a competitive basis. Contact the Office of Admissions or https://www.statetechmo.edu/pta/ for the specific application requirements, forms, and deadline. Informational sessions are held periodically and are required as a part of the application process. Contact the PTA program office at 573-897-5340 for the next available session.

Students who are admitted to the Physical Therapist Assistant program should be aware that they will be subject to drug screening. Students are responsible for attaining CPR certification prior to clinical education. Criminal background checks will be required prior to clinical placement. Per Missouri law, persons who have been convicted of or pled guilty to certain felony offenses may be prohibited from holding any direct patient care positions. This could prevent placement in and completion of clinical education courses that are required to complete the Physical Therapist Assistant Associate of Applied Science degree.

To view program outcome data, visit https://www.statetechmo.edu/programs/healthsci/pta/ptafacts/.
Please note: Human Anatomy and Physiology with lab grades will be utilized to rank students for admission in the Physical Therapist Assistant program beginning in Fall of 2021. A grade of “B” or better in Human Anatomy and Physiology with labs is required.

Program Mission
The Physical Therapist Assistant program prepares competent physical therapist assistants who provide physical therapy services under the supervision of licensed physical therapists to help optimize movement to improve the human experience.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Behaviors and skills sought by employers.
- Entry-level skills consistent with contemporary physical therapy practice necessary to work as a physical therapist assistant under the supervision of licensed physical therapists in a variety of clinical settings.
- Communication, professionalism, critical thinking, and leadership skills that will enhance job performance.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>PTA 101</td>
<td>Introduction to PTA</td>
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<tr>
<td>PTA 115</td>
<td>Basic Patient Care Lab</td>
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<td>PTA 116</td>
<td>Basic Patient Care</td>
<td>2</td>
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<tr>
<td>PTA 117</td>
<td>Documentation for the PTA</td>
<td>1</td>
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<tr>
<td>PTA 118</td>
<td>Functional Anatomy and Kinesiology</td>
<td>3</td>
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<tr>
<td>PTA 119</td>
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<td>PTA 121</td>
<td>Physical Agents and Modalities Lab</td>
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<td>PTA 125</td>
<td>Principles of Therapeutic Exercise Lab</td>
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<td>PTA 127</td>
<td>Physical Agents and Modalities</td>
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<td>Comprehensive Review and Licensure Requirements for the PTA</td>
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<td>Neurological Therapeutic Exercise</td>
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<td>Neurological Therapeutic Exercise Lab</td>
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<td>PTA 245</td>
<td>Clinical Practice III</td>
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<td>Research in Physical Therapy</td>
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GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see page 42-43)

Must Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- MAT 119 Elementary Statistics 3

May Not Include:
- ASC 106 Human Anatomy and Physiology with Lab II 4
- NST 101 Network Fundamentals 3

**SUB-TOTAL 19**
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<td>PTA 102</td>
<td>Advanced Musculoskeletal and Nervous System Anatomy</td>
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<td>ASC 106</td>
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**PTA 101 Introduction to PTA.** This course provides an introduction to the role and scope of practice for the physical therapist/physical therapist assistant (PT/PTA). Students begin to learn legal and ethical concepts guiding professional behavior and conduct, develop an awareness of the healthcare delivery system, cultural diversity, evidence-based practice, stress management, work performance and expectations. Students are introduced to the history and role of the American Physical Therapy Association. Students develop skills in using professional terminology for oral and written communications as well as collaboration with peers in a variety of formats. Integration of learning experiences with concurrent technical courses is used to apply and reinforce knowledge. Prerequisites: Acceptance into the PTA program and ASC 104, ASC 106, and PTA 102 with a grade of “C” or better. 1 credit hour.

**PTA 102 Advanced Musculoskeletal and Nervous System Anatomy.** This course includes additional study of the musculoskeletal and nervous systems beyond the concepts from general anatomy and physiology. Focus will be on the skeletal system, joint articulations and motions, muscular system, surface anatomy, and peripheral and central nervous systems. This course provides foundational knowledge necessary to prepare to be a physical therapist assistant. Prerequisite: ASC 104 with a grade of “C” or better. Corequisite: ASC 106 with a grade of “C” or better. 2 credit hours.

**PTA 115 Basic Patient Care Lab.** This lab course provides an introduction to basic physical therapy intervention skills and procedures and provides an opportunity to practice professional behaviors in a lab setting. Principles and concepts pertaining to positioning and draping; body mechanics; transfers; range-of-motion (ROM); aseptic techniques and wound care; bandaging and dressing; vital signs; wheelchairs and patient transporting; gait training; Americans with Disabilities Act (ADA) and massage are included. Prerequisites: Acceptance into the PTA program and ASC 104, ASC 106, and PTA 102 with a grade of “C” or better. Concurrent: PTA 116. 1 credit hour.

**PTA 116 Basic Patient Care.** This lecture course provides an introduction to professional behaviors and basic physical therapy intervention skills procedures, and documentation. Principles and concepts pertaining to positioning, transfers, range-of-motion (ROM), aseptic technique, wound care, bandaging and dressing, vital signs, wheelchairs, gait training, Americans with Disabilities Act (ADA), documentation and massage are included. Prerequisites: Acceptance into the PTA program and ASC 104, ASC 106, and PTA 102 with a grade of “C” or better. Concurrent: PTA 115. 2 credit hours.

**PTA 117 Documentation for the PTA.** This course examines the purposes of documentation and includes the basic skills needed for a physical therapist assistant (PTA) to document patient care. The relationship between documentation and the patient/client management process is examined with emphasis on the role of the PTA in reading the initial documentation and following the plan of care established by the Physical Therapist and documenting on the care provided. The focus is on problem based medical records with integration of medical terminology and abbreviations to enhance clarity and brevity. Prerequisites: Acceptance into the PTA program and ASC 104, ASC 106, and PTA 102 with a grade of “C” or better. 1 credit hour.

**PTA 118 Functional Anatomy and Kinesiology.** This lecture course includes an in-depth study of the structure and function of the musculoskeletal system emphasizing functional aspects of human motion and the biomechanical principles involved. The course also investigates the theoretical basis of various data collection methods including
manual muscle testing, goniometric measurements, muscle length, gait and postural assessments, among others. The course incorporates concepts related to the roles of the physical therapist/physical therapist assistant (PT/PTA), use of professional behaviors, and use of appropriate medical language through written and verbal communications. Prerequisites: Acceptance into the PTA program and ASC 104, ASC 106, and PTA 102 with a grade of “C” or better. Concurrent: PTA 119. 3 credit hours.

**PTA 119 Functional Anatomy and Kinesiology Lab.** This lab course provides an introduction to basic physical therapy data collection methods and gives the student the opportunity to practice professional behaviors as well as clinical skills in a lab setting. The student learns principles and procedures related to manual muscle testing, goniometry, muscle length assessment, posture and gait analysis. The application of various concepts related to biomechanics, Newton’s laws of motion, joint structure, the nervous system, and analysis of human motion are also included. The course emphasizes concepts related to the roles of the physical therapist/physical therapist assistant (PT/PTA), use of professional behaviors, and use of appropriate medical language through written and verbal communications. Prerequisites: Acceptance into the PTA program and ASC 104, ASC 106, and PTA 102 with a grade of “C” or better. Concurrent: PTA 118. 1 credit hour.

**PTA 121 Physical Agents and Modalities Lab.** This lab course provides the physical therapist assistant (PTA) student with opportunities to practice clinical application skills needed to perform thermal and mechanical treatment modalities used in physical therapy. Emphasis is placed on critical thinking and problem solving to assure that the modality is applied according to the physical therapist’s plan of care and to maximize treatment effectiveness. Safety procedures, indications, contraindications, and precautions are learned and applied for each modality. The student learns to use professional and understandable terminology in written and verbal communication and patient education relative to physical agents. Prerequisites: PTA 101, PTA 115, PTA 116, and PTA 117 with a grade of “C” or better. Concurrent: PTA 127. 1 credit hour.

**PTA 125 Principles of Therapeutic Exercise Lab.** This course introduces the student to the use of exercise as a preventive and treatment mechanism for pathological conditions which influence strength, endurance and flexibility. Students apply principles, design and techniques of therapeutic exercise and functional training. Students will learn to: describe the principles of therapeutic exercise, formulate rationale for the application of and modification of therapeutic exercise, safely and effectively implement therapeutic exercise interventions based on a plan of care established by a physical therapist, measure response to exercise interventions and respond accordingly, demonstrate patient education, and communicate the outcomes of the intervention. Students will learn and practice many types of exercise prior to learning how to apply exercise to specific pathologies. Prerequisites: PTA 101, PTA 115, PTA 116 and PTA 117 with a grade of “C” or better. Concurrent: PTA 121. 1 credit hour.

**PTA 127 Physical Agents and Modalities.** This lecture course provides the physical therapist assistant (PTA) student with theoretical knowledge and practical information about physical agents in rehabilitation. The basic scientific and physiological principles underlying the application of physical agents are explored. Indications, contraindications, and precautions are learned for each modality. Prerequisites: PTA 101, PTA 115, PTA 116, and PTA 117 with a grade of “C” or better. Concurrent: PTA 121. 1 credit hour.

**PTA 129 Health and Disease I.** This course is an investigation of disease processes, pharmacology and medical management of cardiovascular, respiratory, musculoskeletal, nervous, autoimmune, lymphatic, and endocrine systems, including geriatric diagnoses commonly seen in physical therapy. The process of inflammation and repair are emphasized. Content includes peripheral vascular disease and amputation, cardiac and pulmonary disorders, arthritis, and diabetes. As each system is examined, clinical manifestations and the possible physical therapy interventions are reviewed. Prerequisites: Acceptance into the PTA program and PTA 102 with a grade of “C” or better. 4 credit hours.

**PTA 135 Clinical Practice I.** This is a four week (40 hours per week) clinical experience that provides the student with his/her first opportunity for hands-on patient care. The student will apply basic skills learned in the classroom to the clinical setting making the connection between theory and practice. The student will work under the direct supervision of a licensed physical therapy professional in an assigned/approved facility. This clinical experience provides opportunities for development of appropriate professional behaviors related to the role of the physical therapist assistant (PTA). Prerequisites: PTA 118, PTA 119, PTA 121, PTA 125, PTA 127, and PTA 129 with a grade of “C” or better. 2 credit hours.
PTA 201  **PTA as a Profession.** This course provides an introduction to the profession of a physical therapist/physical therapist assistant (PT/PTA) practice. Students learn case-based legal and ethical concepts guiding professional behavior and conduct in the clinical setting and develop an awareness of professional duty, responsibility, and advocacy. Students are introduced to billing and reimbursement methods and issues in various healthcare settings. Students are introduced to the Missouri State Practice Act. Students are directed toward lifelong learning, productivity, and career development planning. Integration of learning experiences with concurrent technical courses is used to apply and reinforce knowledge as well as educate others about the profession of physical therapist assistant (PTA). Prerequisites: PTA 118, PTA 119, PTA 121, PTA 125, PTA 127, and PTA 129 with a grade of “C” or better. 1 credit hour.

PTA 202  **Health and Disease II.** This course is an investigation of disease processes, pharmacology and medical management of integumentary, gastrointestinal, genitourinary, obstetrics, and oncology diagnoses commonly seen in physical therapy. The disease process and treatment are emphasized. Content includes burns, pregnancy, cancer, obesity, and pediatric conditions. As each system is examined, clinical manifestations and the possible physical therapy interventions are reviewed. Prerequisites: PTA 118, PTA 119, PTA 121, PTA 125, PTA 127, and PTA 129 with a grade of “C” or better. 1 credit hour.

PTA 204  **Electrotherapeutic Modalities.** This lecture course addresses the basic principles of electricity and electrotherapy. It investigates the basic physical science, the electrophysiology, and the clinical use of physical therapy electrical modalities. Students will learn to recognize common indications, contraindications, and special precautions to the application of electrotherapeutic modalities. Application of electrotherapeutic agents for pain, neuromuscular stimulation, and tissue/wound healing will be studied. Prerequisites: PTA 118, PTA 119, PTA 121, PTA 125, PTA 127, and PTA 129 with a grade of “C” or better. Concurrent: PTA 205. 1 credit hour.

PTA 205  **Electrotherapeutic Modalities Lab.** This lab course enables the student to gain competency in the safe and effective application of electrical stimulation modalities currently used in physical therapy practice. Indications, contraindications, and precautions are examined and students have opportunities to problem-solve clinical applications to maximize the benefit of the modality. Prerequisites: PTA 118, PTA 119, PTA 121, PTA 125, PTA 127, and PTA 129 with a grade of “C” or better. Concurrent: PTA 204. 1 credit hour.

PTA 208  **Orthopedics for the PTA.** This lecture course involves an in-depth study of orthopedic conditions, physical therapy data collection, and interventions for orthopedic and cardiopulmonary clients. Previously learned therapeutic exercise techniques are applied to orthopedic and cardiopulmonary conditions, and the relationship between interventions and anatomical structure, function, and pathophysiology are examined. The student reviews the role of the physical therapist assistant (PTA) as a part of the rehabilitation team related to development and delivery of orthopedic therapeutic exercise. Prerequisites: PTA 118, PTA 119, PTA 121, PTA 125, PTA 127, and PTA 129 with a grade of “C” or better. Concurrent: PTA 211. 2 credit hours.

PTA 211  **Orthopedics Lab for the PTA.** This lab course provides students with opportunities to create and implement therapeutic exercise programs following the physical therapist (PT) plan of care. Students will apply previously learned therapeutic exercise techniques to orthopedic and cardiopulmonary conditions. The student portrays the role of the physical therapist assistant (PTA) as a part of the rehabilitation team related to development and delivery of orthopedic therapeutic exercise with the instructor and/or lab assistant serving as the supervising physical therapist (PT). Prerequisites: PTA 118, PTA 119, PTA 121, PTA 125, PTA 127, and PTA 129 with a grade of “C” or better. Concurrent: PTA 208. 1 credit hour.

PTA 220  **Comprehensive Review and Licensure Requirements for the PTA.** This course is designed to assist students in preparation to apply and sit for licensure as a physical therapist assistant. Content, scope, and format of the National Physical Therapist Assistant Exam (NPTAE) will be addressed. A licensure exam prep course will be provided as a part of this course. This course will include test-taking skills, study skills, content review, and self-assessment exercises to facilitate preparation for the examination. Prerequisites: PTA 201, PTA 202, PTA 204, PTA 205, PTA 208, PTA 211, PTA 223, and PTA 224 with a grade of “C” or better. 2 credit hours.

PTA 223  **Neurological Therapeutic Exercise.** This lecture course provides an introduction to the pathology, pathophysiology, medical interventions, testing, and treatments of neurological disease and dysfunction. A general overview of anatomy and physiology of the nervous system as well as adult and pediatric neurologic diseases and
dysfunctions signs and symptoms, medical interventions, and specialized testing are included in this course. Principles and concepts pertaining to sensation, perception, motor control, posture, balance, coordination, functional mobility, and ambulation are also included. The student examines theories and techniques of therapeutic intervention commonly used in the treatment of neurologic disease and dysfunction. The course incorporates concepts related to the roles of the physical therapist/physical therapist assistant (PT/PTA), professional behaviors, and the use of appropriate medical language through verbal and written communications. Prerequisites: PTA 118, PTA 119, PTA 121, PTA 125, PTA 127, and PTA 129 with a grade of “C” or better. Concurrent: PTA 224. 3 credit hours.

PTA 224 Neurological Therapeutic Exercise Lab. This lab course provides an introduction to the pathophysiology, medical intervention, and rehabilitation treatment of adult and pediatric neurological disease and dysfunction. Students have the opportunity to practice clinical skills and professional behaviors in a lab setting. Principles and procedures related to motor control, sensation, perception, therapeutic exercise, posture, balance, gait analysis, and gait training are studied using a case-based format. The student explores the role of the physical therapist assistant (PTA) in the treatment of neurological dysfunction, develops effective communication skills for patient/client and family education, and utilizes appropriate medical language through written and verbal communications. Prerequisites: PTA 118, PTA 119, PTA 121, PTA 125, PTA 127, and PTA 129 with a grade of “C” or better. Concurrent: PTA 223. 2 credit hours.

PTA 235 Clinical Practice II. This is a six week (40 hours per week) clinical experience that provides the student with opportunities to provide patient care under the supervision of a licensed physical therapy professional in an assigned/approved facility. The student will apply concepts and skills learned in the classroom to the clinical setting, strengthening the connection between theoretical and foundational knowledge. The student will work with a variety of patients to develop competence in clinical skills and exhibit appropriate professional behaviors related to the role of the physical therapist assistant (PTA) as part of the healthcare team. Prerequisites: PTA 135, PTA 201, PTA 202, PTA 204, PTA 205, PTA 208, PTA 211, PTA 223, and PTA 224 with a grade of “C” or better. Concurrent: PTA 223. 2 credit hours.

PTA 245 Clinical Practice III. This is a six week (40 hours per week) clinical experience that provides the student with opportunities to provide patient care under the supervision of a licensed physical therapy professional in an assigned/approved facility. The student will apply concepts and skills learned in the classroom to the clinical setting, strengthening the connection between theoretical and foundational knowledge. The student will work with a variety of patients to develop competence in clinical skills and exhibit appropriate professional behaviors related to the role of the physical therapist assistant (PTA) as part of the healthcare team. This clinical experience facilitates development of cultural competence, quality assurance, and billing practices. Student will have the opportunity to present and education in-service to the healthcare team. Prerequisites: PTA 135, PTA 201, PTA 202, PTA 204, PTA 205, PTA 208, PTA 211, PTA 223, and PTA 224 with a grade of “C” or better. 4 credit hours.

PTA 289 Research in Physical Therapy. Students explore types and methods of research as well as sources and means of literature review. A thesis statement is developed and students access and analyze evidence-based research to support their thesis. Other methods of acquiring information may entail book review, medical case study, clinical observation, and discussion with physical therapy practitioners. Prerequisites: PTA 135, PTA 201, PTA 202, PTA 204, PTA 205, PTA 208, PTA 211, PTA 223, and PTA 224 with a grade of “C” or better. 2 credit hours.

PTA 299 Special Topics in Physical Therapist Assistant. Special Topics in Physical Therapist Assistant (PTA) may include instruction on topics not covered in other PTA courses. Topics covered in other PTA courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
POWERSPORTS TECHNOLOGY

Classification of Instructional Programs - 01.0201

Associate of Applied Science Degree

General Option

Agriculture & Turf Equipment Option

One-Year Certificates

Basic

Advanced

The Powersports Technology program prepares individuals to perform maintenance, troubleshooting, and overhaul of the major components of powersports, agricultural, outdoor power, and marine equipment and machinery. Instruction is provided in the classroom on theory, inspection, maintenance, troubleshooting, and repair of wheels, brakes, operating controls, steering, hydraulics, suspension, electrical circuitry, electronic/mechanical engines, manual/automatic shift transmissions, and marine drives. Students gain real-world experience through lab projects and a summer internship.

The Powersports Technology program is accredited by the Equipment & Engine Training Council (EETC) in Two-Stroke and Four-Stroke Engines, Electrical, Compact Diesel Engines, and Driveline/Hydraulics. All students will have the opportunity to become certified through EETC in these systems. The degree program and its options are also accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

Students seeking an Associate of Applied Science degree may choose from two options. Both options give students a solid foundation in servicing, selecting, and selling powersports, agricultural, outdoor power, and marine equipment and machinery along with computer, communication, and mathematical skills. The General Option includes instruction on all the systems of powersports, agricultural, outdoor power, and marine units. The Agriculture & Turf Equipment Option is designed for students with career goals that are more focused on the agriculture or turf industry. Students in this option select elective courses such as agribusiness; equipment operation and maintenance; pest, weed, and disease control; irrigation and erosion control; reel and rotary technology; turfgrass management; or commercial site contracting.

Students who are interested in the General Option may choose to pursue a Basic One-Year Certificate that meets employer needs for entry-level technicians. Upon successful completion of the Basic Certificate, students may choose to pursue an Advanced One-Year Certificate. The Advanced Certificate is also available for those who have gained powersports knowledge and skills through other means such as industry experience or college studies to develop additional skills.

Graduates will have the knowledge and skills required to be productive in positions such as technician, adjuster, and service writer. Powersports, agricultural, outdoor power, and/or marine employment opportunities include original equipment manufacturer dealers, independent sales and service shops, farm-related employers, golf course maintenance shops, equipment rental companies, and/or government agencies.
The program contributes to the green economy by teaching students to work with electric power being used in powersports, agricultural, outdoor power, and marine equipment and machinery. Students are also taught about different types of alternative fuels and their impacts on the environment. Biodegradable solvents and other products are used to help reduce water, air, and soil contamination.

It is a graduation requirement of the Powersports Technology (PST) degree for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses. It is a graduation requirement of the Powersports Technology (PST) certificate for students to earn a grade of “C” or better in all “Core Curriculum” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/transportationtech/ops/opsfacts/.

Program Mission
The mission of the Powersports Technology program is to provide students with the opportunity to develop the technical and interpersonal skills necessary to succeed in today’s powersports, agriculture, outdoor power, and marine industries.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Electrical knowledge and skills needed to repair and maintain powersports, agricultural, outdoor power, and marine equipment.
- Knowledge and skills necessary to repair, maintain and troubleshoot two-stroke, four-stroke, and diesel engines.
- Knowledge and skills necessary to repair, maintain, and troubleshoot drive train, marine drive, suspension and steering, hydraulic, hydrostat, and brake systems.
- Critical thinking skills used in troubleshooting.
- Oral and written communication skills needed in the industry.
- Knowledge and skills necessary for agribusiness; equipment operation and maintenance; pest, weed, and disease control; irrigation and erosion control; reel and rotary technology maintenance; turfgrass management; and commercial site contracting. (This goal applies to only the Agriculture & Turf Equipment Option.)

**CORE CURRICULUM**

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<td>PST 120</td>
<td>Electrical Fundamentals</td>
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<td>PST 140</td>
<td>Wheels, Tires, &amp; Brakes</td>
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<td>PST 150</td>
<td>Two-Stroke &amp; Four-Stroke Gas Engines</td>
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<td>PST 155</td>
<td>Fuel Delivery Systems</td>
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<tr>
<td>PST 165</td>
<td>Starting, Ignition, &amp; Charging Systems</td>
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<td>PST 205</td>
<td>Internship</td>
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<td>PST 210</td>
<td>Powertrain &amp; Drive Systems</td>
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<td>PST 220</td>
<td>Electrical Systems &amp; Electronic Controls</td>
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<td>Diesel Engines</td>
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<td>Hydraulic Systems</td>
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<td>Basic Welding</td>
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**SUB-TOTAL** 35
**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements 19
(see page 42-43)
Must Include:
- COM 111 Oral Communications 3
- PHY 100 Physical Science 4
  OR
- PHY 103/104 Environmental Science 4
May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4
- NST 101 Network Fundamentals 3

**SUB-TOTAL** 19

**PROGRAM REQUIREMENTS**

**General Option**

| PST | 100 | Introduction to the Industry | 2 |
| PST | 130 | Attachments, Accessories, & Implements | 2 |
| PST | 235 | Job Estimating, Troubleshooting, & Diagnostics | 3 |
| PST | 255 | Frame & Suspension Systems | 2 |
| PST | 265 | Basic Shop Management | 3 |
| PST | 285 | Emerging Industry Technologies | 3 |

**SUB-TOTAL** 15

**OR**

**Agriculture & Turf Equipment Option**

Choose 16 to 18 credit hours from the following elective courses:

| CTG | 105 | Missouri Pesticide Application | 1 |
| CTG | 107 | Turfgrass Management I | 3 |
| CTG | 109 | Equipment Operations and Maintenance | 3 |
| CTG | 117 | Commercial Site Contracting | 3 |
| CTG | 201 | Weeds and Diseases | 3 |
| CTG | 204 | Insects and Pests | 3 |
| CTG | 206 | Irrigation and Drainage | 3 |
| CTG | 207 | Turfgrass Management II | 3 |
| CTG | 225 | Reel and Rotary Technology | 2 |
| AGR | 100 | Introduction to Agribusiness Systems | 3 |

**SUB-TOTAL** 16-18

**Graduation Requirements**

| COM | 125 | Job Search Strategies | 1 |

**SUB-TOTAL** 1

It is a graduation requirement of the Powersports Technology (PST) degree for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

**Program Total** 70-73
## POWERSPORTS TECHNOLOGY

### Basic One-Year Certificate

#### CORE CURRICULUM

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<td>Wheels, Tires, &amp; Brakes</td>
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<td>PST 150</td>
<td>Two-Stroke &amp; Four-Stroke Gas Engines</td>
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<td>PST 155</td>
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<td>PST 165</td>
<td>Starting, Ignition, &amp; Charging Systems</td>
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**SUB-TOTAL**: 16

#### GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see page 42-43)

Must Include:
- Three credit hours from Area 1. Oral & Written Communication
  AND
- Three credit hours from Area 5. Technical Literacy

May Not Include:
- NST 101 Network Fundamentals

**SUB-TOTAL**: 6

#### PROGRAM REQUIREMENTS

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**SUB-TOTAL**: 7-10

#### GRADUATION REQUIREMENTS

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**SUB-TOTAL**: 1

*It is a graduation requirement of the Powersports Technology (PST) certificate for students to earn a grade of “C” or better in all “Core Curriculum” courses.*

**PROGRAM TOTAL**: 30-33

## POWERSPORTS TECHNOLOGY

### Advanced One-Year Certificate

#### CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>PST 210</td>
<td>Powertrain &amp; Drive Systems</td>
<td>2</td>
</tr>
<tr>
<td>PST 220</td>
<td>Electrical Systems &amp; Electronic Controls</td>
<td>3</td>
</tr>
<tr>
<td>PST 225</td>
<td>Diesel Engines</td>
<td>2</td>
</tr>
<tr>
<td>PST 235</td>
<td>Job Estimating, Troubleshooting, &amp; Diagnostics</td>
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<tr>
<td>PST 245</td>
<td>Hydraulic Systems</td>
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174
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<th>Course</th>
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<td>PST 255</td>
<td>Frame &amp; Suspension Systems</td>
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<td>PST 265</td>
<td>Basic Shop Management</td>
<td>3</td>
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<tr>
<td>PST 285</td>
<td>Emerging Industry Technologies</td>
<td>3</td>
</tr>
<tr>
<td>PST 290</td>
<td>Advanced Troubleshooting &amp; Diagnostics</td>
<td>3</td>
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<tr>
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**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements (see page 42-43)

Must Include:

Three credit hours from Area 1. Oral & Written Communication 3

AND

Three credit hours from Area 5. Technical Literacy 3

May Not Include:

NST 101 Network Fundamentals 3

**SUB-TOTAL** 6

**PROGRAM REQUIREMENTS**

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<tr>
<th>Course</th>
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<tr>
<td>MAT 051</td>
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<tr>
<td>WLT 128</td>
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**GRADUATION REQUIREMENTS**

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<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
<td>1</td>
</tr>
<tr>
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</table>

It is a graduation requirement of the Powersports Technology (PST) certificate for students to earn a grade of “C” or better in all “Core Curriculum” courses.

**PROGRAM TOTAL** 37

**PST 100 Introduction to the Industry.** This course introduces and illustrates all components of powersports, agricultural, outdoor power, and marine equipment. Safety, environmental protection, tool usage, fasteners, and gaskets are covered. 2 credit hours.

**PST 110 Preventive Maintenance, Operation, & Inspection.** This course includes instruction in lubrication and cooling systems. Students learn how air-cooled and liquid-cooled systems work as well as the major parts of both two-stroke and four-stroke engine lubrication systems and how these systems are serviced. Types and characteristics of motor oil, coolants, gearbox systems, radiator caps, and thermostats are covered. Students will also be taught the safe operation of equipment before and after service. 2 credit hours.

**PST 120 Electrical Fundamentals.** This course includes instruction in battery, charging, and ignition systems. The use of electricity to provide the source of starting and operating power as well as the operation and design of common ignition systems are covered. Vacuum, centrifugal advance, half-wave and full-wave rectification, alternators, regulators, batteries, and AC charging systems are included. 2 credit hours.

**PST 130 Attachments, Accessories, & Implements.** This course includes the fundamentals of attachments, accessories, and implements as well as troubleshooting and installation. Electrical, mechanical, and hydraulic systems are also covered. The importance of schematics in electrical circuits as well as interpreting installation procedures and adjustments are emphasized. 2 credit hours.
PST 140  **Wheels, Tires, & Brakes.** This course includes instruction in front and rear wheels, tires, and brake systems. Types of wheels; wheel inspection; repacking wheel bearings; wheel removal, installation, lacing, truing, straightening, balancing, and troubleshooting are covered. Types of tires, tire removal, flat repair, and tire installation are included. Students learn the operating principles of mechanical drum and hydraulic disc brake systems and how inspection, troubleshooting, and repairs are performed. The advantages of anti-lock brake systems (ABS) and linked braking systems (LBS) are explored. 2 credit hours.

PST 150  **Two-Stroke & Four-Stroke Gas Engines.** This course includes instruction on two-stroke and four-stroke engines. Engine parts, installation, initial starting, break-in, inspection, diagnosis, tune-up, general service, reconditioning, and reassembly are covered. Ignition system, fuel system, and valve train adjustments are included. 2 credit hours.

PST 155  **Fuel Delivery Systems.** This course includes instruction in carburetion and electronic fuel injection. Students will learn the theory and operation of various types of carburetors as well as electronic fuel injection systems. Carburetors, fuel tanks, manual and electric fuel pumps, sensors, senders, fuel taps, and related tubing are also covered. 2 credit hours.

PST 165  **Starting, Ignition, & Charging Systems.** This course teaches the theories of electric starting systems, breaker point, capacitor discharge ignition (CDI), and different types of charging systems. The students will also service and troubleshoot alternators, batteries, rectifiers, stators, switches, wiring, regulators, relays, starters, solenoids, schematics, and all components associated with the starting, charging, and ignition systems. Prerequisite: PST 120. 2 credit hours.

PST 205  **Internship.** Students are required to work a minimum of twelve weeks and perform a variety of tasks. Program objectives, students’ educational objectives, and employer’s on-the-job training capabilities determine internship content and objectives. A training agreement between the employer, the student and the college is required. The student will submit a weekly summary of activities (tasks performed). Prerequisite: Department Chair approval. 8 credit hours.

PST 210  **Powertrain & Drive Systems.** This course includes instruction on powertrains used on light equipment. Classroom and lab instruction on components and systems is included. The use of diagnostic equipment and test interpretation are highly emphasized. Topics include: powertrain theory and principles, clutches, manual transmissions, drive shafts, differentials, final drives, hydrostatic drives, stern and jet drives, failure analysis, and terminology. 2 credit hours.

PST 220  **Electrical Systems & Electronic Controls.** This course includes instruction on the safety precautions and knowledge required to service electrical and electronic systems. Electrical and electronic theory, system design and operation, the proper use of test equipment, and the procedures used to diagnose and repair electrical and electronic problems are covered. Prerequisite: PST 120. 3 credit hours.

PST 225  **Diesel Engines.** This course includes instruction on two-stroke and four-stroke diesel engines. Engine parts, installation, initial starting, break-in, inspection, diagnosis, tune-up, general service, reconditioning, and reassembly are covered. Fuel system and valve train adjustments are included. Prerequisite: PST 150. 2 credit hours.

PST 235  **Job Estimating, Troubleshooting, & Diagnostics.** This course includes instruction on diagnosing and troubleshooting problems and estimating the time and cost involved with repairs. 3 credit hours.

PST 245  **Hydraulic Systems.** This course teaches the fundamentals of hydraulic circuits as well as how to diagnose and test problem areas. Pumps, motors, valves, and electrical controls are also covered. Schematics are used to understand the function of valves, fluid flow, and electrical control circuits. 2 credit hours.

PST 255  **Frame & Suspension Systems.** This course includes instruction on frame and suspension system designs and how they affect performance and dependability. Fundamental inspection, service, repair, and troubleshooting procedures on frames and suspension systems are covered. 2 credit hours.
PST 265  **Basic Shop Management.** This course teaches the basic principles and responsibilities of a technician within a dealership or repair center. Topics covered include repair orders, work orders, customer relations, peer relations, warranty work, and networking with other departments within the dealership or repair center including the parts and sales departments. 3 credit hours.

PST 285  **Emerging Industry Technologies.** This course introduces students to emerging changes in the powersports, agricultural, outdoor power, and marine industries including changes to minor and major equipment components. Examples of topics that may be studied include modifications and innovations to electrical, fuel, braking, power, steering, and climate control systems. 3 credit hours.

PST 290  **Advanced Troubleshooting & Diagnostics.** This course teaches students to expertly troubleshoot equipment and solve problems by replacing only defective equipment or components in the least amount of time. One of the most important factors in troubleshooting and diagnosing is using the correct approach. A troubleshooter uses a system or an approach that allows them to logically and systematically analyze a problem and determine exactly what is wrong. This course teaches a new approach that differs from basic troubleshooting procedures. Critical thinking is used to analyze and determine what component or components are responsible for the faulty operation of a unit. This approach is general in nature allowing it to be used on any type of problem. 3 credit hours.

PST 299  **Special Topics in Powersports Technology.** Special Topics in Powersports Technology (PST) may include instruction on topics not covered in other PST courses. Topics covered in other PST courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
PRACTICAL NURSING TECHNOLOGY

Classification of Instructional Programs – 51.3901

Two-Year Certificate

Licensed Practical Nurses are healthcare professionals responsible for providing direct patient care in many healthcare settings. Licensed Practical Nurses utilize the nursing process to plan, provide, and evaluate individualized care to meet basic patient needs. The State Technical College of Missouri Practical Nursing Technology (PNT) program prepares students to perform all skills that are within the scope of practice as outlined by the Missouri Nurse Practice Act for Licensed Practical Nurses including intravenous therapy skills. The Practical Nursing Technology program has full approval by the Missouri State Board of Nursing, 3605 Missouri Boulevard, Jefferson City, MO 65102; (573) 751-0293; www.pr.mo.gov.

The Practical Nursing Technology program is an eleven month, three semester program with 1,290 total instructional hours including a minimum of 360 clock hours of clinical study in which students will participate at approved clinical sites that include local hospitals, long-term care facilities, physician clinics, area schools, and other healthcare agencies. To be successful, students need effective communication skills and a solid background in science and math.

Upon successful completion of the program and approval from the Missouri State Board of Nursing, students become eligible to take the National Council Licensure Examination for Practical/Vocational Nurses (NCLEX-PN).

Enrollment in the Practical Nursing Technology program is limited, and students are selected for this program on a competitive basis. Contact the Office of Admissions or https://www.statetechno.edu/pnt/ for the specific application requirements, forms, and deadline.

Students who are admitted to the Practical Nursing Technology program should be aware that they will be subject to drug screening. Criminal background checks will be required prior to clinical placement. Per Missouri law, persons who have been convicted of or pled guilty to certain felony offenses may be prohibited from holding any direct patient care positions. This could prevent placement in and completion of clinical education courses, which are required to complete the Practical Nursing Technology Two-Year Certificate program.

A grade of “C” or better must be maintained in all courses in order to continue and graduate in the Practical Nursing Technology program.

Please note: Students interested in continuing their education and applying for the Associate of Applied Science Degree in Nursing program in the Fall of 2021, must have a “B” or better in the sciences to be considered for admission. Contact the Office of Admissions or visit the college website for additional details.

To view program outcome data, visit https://www.statetechmo.edu/programs/healthsci/pnt/pntfacts/.

Program Mission

The mission of the Practical Nursing Technology program is to prepare students for the competitive demands of the workforce. Partnerships with the community through healthcare, governmental, and accrediting agencies assist the program in providing learning environments in which students build upon their skills and knowledge to strengthen their understanding of local, state, and national health issues.

Program Goals

The goals of the program are to provide the opportunity for students to develop:

- Skills to be a safe and effective practitioner within the practical nursing scope of practice.
- Individual growth in their personal, vocational, and community lives in order to more effectively develop as a practical nurse and provide quality care.
- Competency in practical nursing skills with the focus of providing patient centered care.
- Ability to assume a role as a member of both the nursing and healthcare team through collaboration with nursing faculty, advisory committee members, and cooperating agencies.
- Clinical reasoning skills along with the utilization of best practice standards within the practical nursing scope of practice.
- Nursing and technological knowledge in preparation for eligibility to take the NCLEX-PN examination to become a Licensed Practical Nurse.

### CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>PNT 105</td>
<td>Personal and Vocational Concepts</td>
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<tr>
<td>PNT 114</td>
<td>Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td>PNT 116</td>
<td>Medication Calculation and Administration, and IV Therapy w/Lab</td>
<td>4</td>
</tr>
<tr>
<td>PNT 120</td>
<td>Fundamentals of Nursing I w/Lab</td>
<td>4</td>
</tr>
<tr>
<td>PNT 125</td>
<td>Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>PNT 130</td>
<td>Fundamentals of Nursing II w/Lab</td>
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<tr>
<td>PNT 150</td>
<td>Medical Surgical Nursing I</td>
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<tr>
<td>PNT 155</td>
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<tr>
<td>PNT 165</td>
<td>Level II Clinical</td>
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<tr>
<td>PNT 210</td>
<td>Maternity Nursing</td>
<td>4</td>
</tr>
<tr>
<td>PNT 215</td>
<td>Nursing Care of Children</td>
<td>4</td>
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<tr>
<td>PNT 225</td>
<td>Level III Clinical</td>
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<tr>
<td>PNT 230</td>
<td>Leadership and Management</td>
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<tr>
<td>PNT 250</td>
<td>Medical Surgical Nursing II</td>
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<td>PNT 260</td>
<td>Medical Surgical Nursing III</td>
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### GENERAL EDUCATION REQUIREMENTS

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<tr>
<td>ASC 104</td>
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<tr>
<td>ASC 106</td>
<td>Human Anatomy and Physiology with Lab II</td>
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### GRADUATION REQUIREMENTS

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It is a graduation requirement of the Practical Nursing Technology (PNT) program for students to earn a grade of “C” or better in all courses.

### PROGRAM TOTAL

**64**

**PNT 105 Personal and Vocational Concepts.** This course is designed to introduce the student to the foundations of modern practical nursing. The student is introduced to the program’s philosophy and conceptual framework along with its rules and regulations. The student learns about individual learning styles, as well as organizational and time management techniques. The educational and professional responsibilities of the practical nurse are explored. Nursing history is explored with a review of nursing theories. The nursing process is introduced. A plan for patient care is developed. Hands-on learning experiences as well as cooperative learning activities and investigative assignments are utilized to assist the student to learn and utilize evidence-based learning and practice. The importance of cultural diversities in healthcare delivery and recognizing each person as a unique individual are
introduced. Methods of developing communication skills that allow the development of effective interpersonal relationships are stressed. The student examines legal and ethical issues in healthcare and prepares to make decisions, as graduates, in compliance with the Missouri Nurse Practice Act in order to practice as responsible nurses within the community. Prerequisites: ASC 104, PSY 161, PNT 120, and PNT 125 with a grade of “C” or better. 3 credit hours.

PNT 114 Pharmacology. This course teaches students to administer medications with concern for safety, accuracy, and attention to physiological factors. It includes drug classifications, source, actions, side effects, adverse reactions, contraindications, and dosage. Prerequisites: ASC 106, PNT 105, PNT 116, and PNT 130 with a grade of “C” or better. 3 credit hours.

PNT 116 Medication Calculation and Administration, and IV Therapy w/Lab. This course prepares the student to administer medications with concern for safety, accuracy, and attention to physiological factors. It includes basic mathematics review as it relates to dosage calculations. Students will perform competencies in various medication administrations and intravenous therapy skills in a safe, legal, and ethical manner utilizing the nursing process along with logical and critical thinking. Students will be taught to perform intravenous fluid therapy treatment utilizing the knowledge, skills, and competencies required to perform such therapy safely and within the practical nursing scope of practice in accordance with the current effective Missouri State Board of Nursing rules and regulations. Prerequisites: ASC 104, PSY 161, PNT 120 and PNT 125 with a grade of “C” or better. 4 credit hours.

PNT 120 Fundamentals of Nursing I w/Lab. This course provides students the opportunity to develop competencies necessary to meet the needs of individuals throughout the lifespan in a safe, legal, and ethical manner using the nursing process. Students learn concepts and theories basic to the art and science of nursing. The role of the nurse as a member of the healthcare team is emphasized. Students are introduced to the concepts of client needs, safety, communication, critical thinking, medical asepsis and infection control, personal care and hygiene, moving and positioning patients, body mechanics, vital signs, and nutritional care and support. Additionally, this course introduces psychomotor nursing skills needed to assist individuals in meeting basic human needs. At the conclusion of this course, students should demonstrate competency in performing basic nursing skills within the practical nursing scope of practice. 4 credit hours.

PNT 125 Nutrition. This course focuses on the introduction to basic principles of nutrition in relation to the human body. Nutrient and food guides for health promotion are identified. The importance of nutrition for prevention of disease processes and maintenance of health across the lifespan is presented. Examination of diet therapy within disease processes are integrated throughout the course. 3 credit hours.

PNT 130 Fundamentals of Nursing II w/Lab. This course is a continuation that provides students additional opportunities to develop competencies necessary to meet the needs of individuals throughout the lifespan in a safe, legal, and ethical manner using the nursing process. Students learn concepts and theories basic to the art and science of nursing. The role of the nurse as a member of the healthcare team is emphasized starting with physical assessment. Students are introduced to clinical skills and care for patients needing support with bowel, urinary, respiratory, and wound care. Additionally, this course reinforces psychomotor nursing skills needed to assist individuals in meeting basic human needs. At the conclusion of this course, students should demonstrate competency in performing basic nursing skills within the practical nursing scope of practice. Prerequisites: ASC 104, PSY 161, PNT 120, and PNT 125 with a grade of “C” or better. 4 credit hours.

PNT 150 Medical Surgical Nursing I. This course is the first of three medical surgical nursing courses. This course focuses on the common medical and surgical disorders encountered in the structured setting. The focuses are on understanding health and illness, the immune system, the cardiovascular system, and the hematologic and lymphatic systems. The emphasis is on diagnosis, symptoms, and treatment including common medications and nursing interventions with the adult and the geriatric client. Nursing theories, various roles of the healthcare team, research, communication, patient teaching, community health resources, professional accountability, and evidence-based practice are emphasized throughout this course. Prerequisites: ASC 106, PNT 105, PNT 116, and PNT 130 with a grade of “C” or better. 4 credit hours.
PNT 155  **Level I Clinical.** This course is designed to introduce fundamental nursing skills and competencies needed to perform safely and effectively as an entry-level practical nursing student. Basic communication skills necessary to develop effective interpersonal relationships are presented. The student will explore issues in nursing care using evidence-based practice and critical thinking skills, including ethical and legal responsibilities. The student will develop a plan of care for the client through the concepts of the nursing process. The student will be oriented to the clinical setting and assigned to various clinical experiences including long-term care, school nursing opportunities, community health, acute care, clinics, and mental health facilities. Prerequisites: ASC 106, PNT 105, PNT 116, and PNT 130 with a grade of “C” or better. 3 credit hours.

PNT 165  **Level II Clinical.** This course is designed to continue developing the foundation of basic nursing skills and competencies needed to perform safely and effectively as a practical nursing student. Basic communication skills necessary to develop effective interpersonal relationships are presented. The student will explore issues in nursing care using evidence-based practice and critical thinking skills, including ethical and legal responsibilities. The student will develop a plan of care for the client through the concepts of the nursing process. The student will be assigned to various clinical experiences including acute care, school nursing opportunities, community health, clinics, and mental health facilities. Prerequisites: PNT 114, PNT 150, and PNT 155 with a grade of “C” or better. 3 credit hours.

PNT 210  **Maternity Nursing.** This course teaches the processes of reproduction and childbearing occurring in the antepartum, intrapartum, and postpartum phases. Previous knowledge of safe basic nursing skills and principles are incorporated as the practical nursing student utilizes the nursing process to facilitate maternal self-care and care of the newborn. Emphasis is placed on the importance of using basic communication skills to establish effective interpersonal relationships with the childbearing family. The student is presented with ethical/legal responsibilities to provide family-centered maternity care within the scope of practice of the practical nursing student. Prerequisites: PNT 114, PNT 150, and PNT 155 with a grade of “C” or better. 4 credit hours.

PNT 215  **Nursing Care of Children.** This course teaches nursing care encompassing physical, intellectual, and emotional growth of the newborn through adolescence. The impact advanced technology has contributed to promoting pediatric health and wellness is studied. Alterations in child health (diseases or disorders) are examined systemically. Nursing care of the pediatric client in the following areas are emphasized: health maintenance, disease prevention, family relations, hospitalization, rehabilitation, grief, and loss. Prerequisites: PNT 165, PNT 210, PNT 230, and PNT 250 with a grade of “C” or better. 4 credit hours.

PNT 225  **Level III Clinical.** This course is designed to continue developing the nursing skills and competencies needed to perform safely and effectively as a practical nursing student. Basic communication skills necessary to develop effective interpersonal relationships are presented. The student will explore issues in nursing care using evidence-based practice and critical thinking skills, including ethical and legal responsibilities. The student will develop a plan of care for the client through the concepts of the nursing process. The student will be assigned to various clinical experiences including long-term care in the leadership role, acute care, community health, clinics, and mental health facilities. Prerequisites: PNT 165, PNT 210, PNT 230, and PNT 250 with a grade of “C” or better. 3 credit hours.

PNT 230  **Leadership and Management.** This course allows students to examine legal and ethical issues in healthcare and prepares them to make decisions, as graduates, in compliance with the Missouri Nurse Practice Act in order to practice as responsible nurses within the community. Students will be given insight into the teamwork concept. Specific emphasis is placed on delegation of tasks, motivation techniques, conflict resolution, initiating change, and time management. As the course comes to completion, students will begin preparation for employment and taking the National Council Licensure Examination for Practical Nurses (NCLEX-PN). Prerequisites: PNT 114, PNT 150, and PNT 155 with a grade of “C” or better. 2 credit hours.

PNT 250  **Medical Surgical Nursing II.** This course is the second of three medical surgical nursing courses. This course focuses on the common medical and surgical disorders encountered in the structured setting. The focuses are on understanding the respiratory system; gastrointestinal, hepatic and pancreatic systems; mental health care; and endocrine system. The emphasis is on symptoms, diagnosis, treatment, and nursing interventions with the adult and geriatric client. Nursing theories, various roles of the healthcare team, research, communication, patient teaching, community health resources, professional accountability, and evidence-based practice are emphasized throughout this course. Prerequisites: PNT 114, PNT 150, and PNT 155 with a grade of “C” or better. 4 credit hours.
PNT 260 Medical Surgical Nursing III. This course is the third of three medical surgical nursing courses. This course focuses on the common medical and surgical disorders encountered in the structured setting. The focuses are on understanding the musculoskeletal, neurologic, sensory, integumentary, and urinary systems. The emphasis is on symptoms, diagnosis, treatment, and nursing interventions with the adult and geriatric client. Nursing theories, various roles of the healthcare team, research, communication, patient teaching, community health resources, professional accountability, and evidence-based practice are emphasized throughout this course. Prerequisites: PNT 165, PNT 210, PNT 230 and PNT 250 with a grade of “C” or better. 4 credit hours.
Precision. Quality. High-speed machining. That’s what it takes to create many of the items in your home and office. And, if the items weren’t created by precision machining technology, then the machinery and equipment needed to produce these products were developed using it.

In our program, students are taught how to select the right machining process, plan that process, and operate computer numerical control (CNC) and manual precision machine tools to create parts or products. Our state-of-the-art lab includes 4- and 5-Axis machining centers, CNC milling machines and lathes, a three-dimensional printer, electrical discharge machining (EDM) equipment, and other industry-standard equipment for students to use in hands-on labs. All labs are supervised by instructors with industry experience. Students will also gain hands-on machining experience through a summer internship. The precision machining capstone projects help to prepare students for a challenging career in this high demand field. With this degree, graduates can choose careers including machining, CNC programming, mold/die making, quality control, or machine tool manufacturing.

The Precision Machining Technology program contributes to the green economy by recycling steel, aluminum, carbide inserts, brass and copper wire. Biodegradable metal cutting fluids and solutions are used to help reduce water, air, and soil contamination.

The Precision Machining Technology program is certified with the National Institute for Metalworking Skills (NIMS) and accredited by the Association of Technology, Management, and Applied Engineering (ATMAE). Students have the opportunity to earn NIMS level I certifications in a variety of machining skills.

It is a graduation requirement of the Precision Machining Technology (PMT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/industrialtech/pmt/pmtfacts/.

Program Mission
The mission of the Precision Machining Technology program is to prepare students with the skills, knowledge, and attributes required for the completion of an Associate of Applied Science degree in the Precision Machining Technology field.

Program Goals
The goals of the program are to provide the opportunity for students to develop:

- Technical skills and knowledge needed to transform ideas and drawings into precision machined parts.
- Precision machining skills on manual and computer operated machines.
- Mathematical skills to compute the needed formulas required for accurate set up, location, feeds, speeds, and coordinates to produce precision machined parts.
- Communication, professionalism, and team building skills that will enhance job performance.
## CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMT 105</td>
<td>Precision Machining Practices I</td>
<td>7</td>
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<tr>
<td>PMT 110</td>
<td>Precision Machining Practices II</td>
<td>3</td>
</tr>
<tr>
<td>PMT 125</td>
<td>CNC Programming – Milling</td>
<td>4</td>
</tr>
<tr>
<td>PMT 145</td>
<td>Quality Control &amp; Precision Measurements</td>
<td>4</td>
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<tr>
<td>PMT 190</td>
<td>Precision Machining Technology Internship</td>
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<tr>
<td>PMT 210</td>
<td>Fundamentals of CAD/CAM</td>
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</tr>
<tr>
<td>PMT 225</td>
<td>Applied CNC Programming</td>
<td>6</td>
</tr>
<tr>
<td>PMT 230</td>
<td>Advanced CAD/CAM</td>
<td>3</td>
</tr>
<tr>
<td>PMT 231</td>
<td>Advanced CNC Machining Applications</td>
<td>3</td>
</tr>
<tr>
<td>PMT 240</td>
<td>Introduction to SolidWorks Design and Modeling</td>
<td>3</td>
</tr>
<tr>
<td>PMT 291</td>
<td>Precision Machining Capstone Course</td>
<td>6</td>
</tr>
<tr>
<td><strong>SUB-TOTAL</strong></td>
<td></td>
<td><strong>46</strong></td>
</tr>
</tbody>
</table>

### GENERAL EDUCATION REQUIREMENTS

General Education Requirements
(see page 42-43)

Must Include:
- PHY 101/102 College Physics 4 credit hours

May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4 credit hours
- ASC 106 Human Anatomy and Physiology with Lab II 4 credit hours
- NST 101 Network Fundamentals 3 credit hours

**SUB-TOTAL** 19 credit hours

### PROGRAM REQUIREMENTS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tr>
<td>DDT 135</td>
<td>Introductory Drafting Fundamentals</td>
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<tr>
<td>WLT 128</td>
<td>Basic Welding</td>
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### GRADUATION REQUIREMENTS

<table>
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<th>Course Title</th>
<th>Credit Hours</th>
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<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
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<tr>
<td><strong>SUB-TOTAL</strong></td>
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<td><strong>1</strong></td>
</tr>
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</table>

It is a graduation requirement of the Precision Machining Technology (PMT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

### PROGRAM TOTAL 72 credit hours

**PMT 105 Precision Machining Practices I.** This course provides the foundation for the use of precision machine technology, hand tools, machining processes, Machinery’s Handbook, measuring instruments, and manual machines for the precision machining trade. Emphasis is placed on skill development through projects in the lab. 7 credit hours.

**PMT 110 Precision Machining Practices II.** This course will continue the use of the knowledge and skills developed in Precision Machining Practices I. Emphasis is placed on completion of the National Institute of Manufacturing Skills (NIMS) projects and other lab projects. Prerequisite: PMT 105 with a grade of “C” or better. 3 credit hours.
PMT 125 CNC Programming - Milling. This course is an introduction to the fundamentals of computer numerical control (CNC) as applied to milling machines. Instruction includes part planning, tooling usage, writing programs, and machine set-up and operation. Through laboratory assignments, students apply programming techniques and operate CNC equipment to produce machined projects. Prerequisite: PMT 105 with a grade of “C” or better. 4 credit hours.

PMT 145 Quality Control & Precision Measurements. This course is an introduction to quality control and focuses on the fundamentals of precision measurements for students who are pursuing careers in precision machining technology or related technical fields. Topics include fundamentals of statistics, control chart variables and attributes, reliability, quality costs, sampling plans, measurements, and probability. Students will be prepared to earn Precision Measurement NC3 Instrument Certification. 4 credit hours.

PMT 190 Precision Machining Technology Internship. The Precision Machining Technology Internship is a planned work experience comprised of paid on-the-job training in a machining related field requiring the student to perform a variety of tasks. A training agreement between the employer, the student, and the college is required. The student will submit a weekly summary of activities (tasks performed). Prerequisites: PMT 110, PMT 125, and PMT 145 with a grade of “C” or better. 4 credit hours.

PMT 196 Machining Essentials. This course teaches how to safely perform fundamental machining operations using mills, lathes, and other machine shop equipment. Precision measurement skills are also included. 3 credit hours.

PMT 210 Fundamentals of CAD/CAM. This course introduces the concepts and practices associated with using computer aided design/computer aided manufacturing (CAD/CAM) software to create programs for computer numerical control (CNC) milling machines. Instruction includes geometry creation and modification; process and toolpath planning; and toolpath generation. Through laboratory assignments, students apply programming techniques and operate CNC equipment to produce machined projects. Prerequisite: PMT 190 with a grade of “C” or better. 3 credit hours.

PMT 225 Applied CNC Programming. This is an advanced computer numerical control (CNC) G-code programming class for the CNC lathe, CNC mill, and wire electrical discharge machine (EDM). Through laboratory assignments, students apply programming techniques and operate CNC equipment to produce machined projects. Prerequisite: PMT 125 with a grade of “C” or better. 6 credit hours.

PMT 230 Advanced CAD/CAM. This course provides instruction on how to use computer aided design/computer aided manufacturing (CAD/CAM) software to create advanced toolpath programs for three-dimensional, 4th and 5th axis milling machines, wire electrical discharge machines (EDM) and computer numerical control (CNC) lathes. Students build upon concepts learned in the Fundamentals of CAD/CAM class. Prerequisite: PMT 210 with a grade of “C” or better. Concurrent: PMT 231. 3 credit hours.

PMT 231 Advanced CNC Machining Applications. This course provides students with an advanced computer numerical control (CNC) machining lab to apply advanced computer aided design/computer aided manufacturing (CAD/CAM) concepts and implement CAD/CAM project designs by setting up and operating complex 4- and 5-axis machining and turning centers. Prerequisite: PMT 225 with a grade of “C” or better. Concurrent: PMT 230. 3 credit hours.

PMT 240 Introduction to SolidWorks Design and Modeling. This course teaches the essential knowledge and skills to create parametric solid parts, assemblies and drawings. A conceptual foundation of solids is developed through case study based design projects. 3 credit hours.
PMT 291 Precision Machining Capstone Course. This is a project-oriented course that incorporates all machining operations into a real world scenario. The projects include necessary process documentation, computer numerical control (CNC), computer aided design/computer aided manufacturing (CAD/CAM), and manual machining operations. The student will design and make metal stamping or plastic injection tooling. Prerequisites: PMT 210 and PMT 225 with a grade of “C” or better. 6 credit hours.

PMT 299 Special Topics in Precision Machining Technology. Special Topics in Precision Machining Technology (PMT) may include instruction on topics not covered in other PMT courses. Topics covered in other PMT courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
UTILITY SYSTEMS TECHNICIAN

Classification of Instructional Programs - 46.0000

Associate of Applied Science Degree

State Technical College of Missouri provides this unique program to serve the employment needs of the outside plant communications and other utility industries. Due to the need to expand and upgrade utility systems in the United States, job demand is high.

Students will gain skills in the construction and maintenance of underground, buried, and overhead broadband systems. The program also familiarizes students with other utility systems such as natural gas distribution, oil pipeline transmission, wastewater, and water to prepare them for careers with a variety of utility contractors and public utilities. Course work includes topics such as underground utility location, fiber optic technology, and industry regulations. Students learn to operate equipment such as digger/derrick and bucket/basket aerial platform trucks along with directional boring machines and hydrovacs. Communications, computational, and troubleshooting skills are also developed.

Students who are admitted to the Utility Systems Technician program should be aware that some industry equipment safety requirements specify a weight limit of 350 pounds or less including required clothing, gear, and tools. The inability to meet this safety requirement will prevent participation in and completion of pole climbing, equipment operation, utility construction, and internship courses that are required to complete the Utility Systems Technician Associate of Applied Science degree. It may also prevent employment in positions that require the use of equipment with these safety specifications.

Students are prepared to earn Fiber Optic Technician certification through The Fiber Optic Association (FOA), Occupational Safety and Health Administration (OSHA) 10-hour training, CPR, First Aid, Flagger, Excavation & Trenching, and Confined Space Entry certifications. Safety and code requirements are stressed in all classes.

Due to industry employment requirements, to enroll and remain enrolled in the Utility Systems Technician program, students are required to receive and maintain at all times a current, valid Class A Commercial Driver’s License (CDL). The CDL training and licensing require students to: 1) maintain a driving record that is eligible for a Missouri Class A CDL, 2) obtain a complete, current, and valid Medical Examination Report and Certificate for Commercial Driver Fitness Determination, and 3) successfully pass drug screen(s).

It is a graduation requirement of the Utility Systems Technician (UST) program for students to earn a grade of “C” or better in all “Core Curriculum” and "Program Requirements" courses; due to state licensing requirements, students must earn a grade of “B” or better in the CDL classes.

To view program outcome data, visit https://www.statetechmo.edu/programs/industrialtech/ust/ustprogramfacts/.

Program Mission

The mission of the Utility Systems Technician program is to provide the students the knowledge and technical skills required to succeed in the outside plant communications and other utility industries.

Program Goals

The goals of the program are to provide the opportunity for students to develop:

- Safe work practices based on Occupational Safety and Health Administration regulations and other industry standards.
- Aerial, underground, and buried utility construction skills needed to gain entry-level employment in the outside plant communications and other utility industries.
- Effective communication skills and employment readiness.
- Mathematical skills necessary to perform calculations required for utility construction.
- Analytical problem solving and critical thinking skills necessary for utility construction.
**CORE CURRICULUM**

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<td>UST 100</td>
<td>Customer Service for Utility Professionals</td>
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<tr>
<td>UST 120</td>
<td>Safety and Accident Prevention I</td>
<td>1</td>
</tr>
<tr>
<td>UST 123</td>
<td>Telecommunications Concepts</td>
<td>3</td>
</tr>
<tr>
<td>UST 125</td>
<td>Safety and Accident Prevention II</td>
<td>1</td>
</tr>
<tr>
<td>UST 150</td>
<td>Equipment Operation I</td>
<td>3</td>
</tr>
<tr>
<td>UST 156</td>
<td>Equipment Operation II</td>
<td>5</td>
</tr>
<tr>
<td>UST 160</td>
<td>Climbing Skills</td>
<td>3</td>
</tr>
<tr>
<td>UST 171</td>
<td>Construction of Overhead Broadband Lines</td>
<td>5</td>
</tr>
<tr>
<td>UST 173</td>
<td>Fiber Optic Technology</td>
<td>3</td>
</tr>
<tr>
<td>UST 186</td>
<td>Gas and Oil Pipeline Systems</td>
<td>2</td>
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<td>UST 190</td>
<td>Underground Utility Location</td>
<td>3</td>
</tr>
<tr>
<td>UST 216</td>
<td>Utility Internship</td>
<td>6</td>
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<tr>
<td>UST 240</td>
<td>Water and Wastewater Systems</td>
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</tr>
<tr>
<td>UST 260</td>
<td>Construction of Underground Utility Systems I</td>
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<td>UST 266</td>
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<tr>
<td>UST 275</td>
<td>Blueprint Reading and Jobsite Management</td>
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**SUB-TOTAL** 50

**GENERAL EDUCATION REQUIREMENTS**

General Education Requirements 19
(see page 42-43)
May Not Include:
- ASC 104 Human Anatomy and Physiology with Lab I 4
- ASC 106 Human Anatomy and Physiology with Lab II 4

**SUB-TOTAL** 19

**PROGRAM REQUIREMENTS**

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<tr>
<td>HEO 152</td>
<td>Basic Commercial Driver License Lab</td>
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**SUB-TOTAL** 2

**GRADUATION REQUIREMENTS**

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>COM 125</td>
<td>Job Search Strategies</td>
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</tbody>
</table>

**SUB-TOTAL** 1

It is a graduation requirement of the Utility Systems Technician (UST) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses; due to state licensing requirements, students must earn a grade of “B” or better in the CDL classes.

**PROGRAM TOTAL** 72

**UST 100 Customer Service for Utility Professionals.** This course provides insights into the concepts and skills related to customer service for utility professionals. The course begins with an overview of the customer service environment and market trends, then focuses on specific skills needed to provide ethical customer service such as verbal and non-verbal communications, listening, and problem solving. Utility industry case studies involving service breakdowns will be used to challenge students to apply the concepts and skills learned to implement service recovery strategies. This course will also cover basic sales techniques when interacting with customers. 1 credit hour.
UST 120  Safety and Accident Prevention I. This course teaches the hazards associated with current-carrying utility systems. The student will be able to implement proper climbing techniques, safety rules, and safe work practices from the American Public Power Association Safety Manual. The student will learn Occupational Safety and Health Administration (OSHA) rules and regulations associated with this industry, reporting requirements, and the penalties that pertain to these regulations. Students will be prepared to earn OSHA 10-hour, CPR, and First Aid certifications. 1 credit hour.

UST 123  Telecommunications Concepts. This course covers the history of telecommunications, services available, and new and emerging technologies. Students will learn basic copper splicing and explore more advanced copper splicing. Students will also research telecommunications career opportunities. 3 credit hours.

UST 125  Safety and Accident Prevention II. This course continues instruction on the hazards associated with utility systems. The student will be able to implement the proper climbing techniques, safety rules, and safe work practices from the American Public Power Association Safety Manual. The student will learn Occupational Safety and Health Administration (OSHA) rules and regulations associated with utility industries, reporting requirements, and the penalties that pertain to these regulations. Students will be prepared to earn Flagger certification. Prerequisite: UST 120 with a grade of “C” or better. 1 credit hour.

UST 150  Equipment Operation I. This course teaches the various operations of digger/derrick and bucket/basket aerial platform trucks used in the construction of utility systems. The student will be familiarized with the basic operation of trencher/backhoe equipment. This class also covers units on mobile hydraulic systems, vehicle maintenance and inspection, safety rules, rigging and lifting capacities, vehicle grounding practices, and the hands-on operation of digger/derrick and bucket/basket aerial platform trucks. 3 credit hours.

UST 156  Equipment Operation II. This course teaches various operations of directional boring machines and hydrovac trucks used in the construction of utility systems. Students will be familiarized with the basic operation of excavators and related excavation equipment. This course also covers units on hand, power, pneumatic, and hydraulic tools; equipment maintenance and inspection; safety rules; and the hands-on operation of directional boring machines and hydrovac trucks. 5 credit hours.

UST 160  Climbing Skills. This course teaches the proper care of climbing tools and climbing wood structures. Upon completion of this course, the student will also be able to determine the proper aspects of pole inspection and be able to recognize the hazards of climbing. Students will successfully complete timed pole top rescue using two different methods. An introduction to aerial pole framing is included. Prerequisite: UST 150 with a grade of “C” or better. 3 credit hours.

UST 171  Construction of Overhead Broadband Lines. This course develops a working knowledge of communication line construction specifications. Students learn to recognize by sight and definition the different types of materials used in the construction of various types of communications systems. Students will be required to demonstrate working specification knowledge both in aerial and ground situations as well as installation, repair, and removal of conductors, guy assemblies, and additional pole hardware. Students will also be introduced to the different sizes and types of overhead and underground communication conductors. Basic line staking principles and National Electric Safety Code clearances will be included. Prerequisite: UST 160 with a grade of “C” or better. 5 credit hours.

UST 173  Fiber Optic Technology. This course will provide instruction in fiber optic technology including theory, safety, installation, splicing and testing techniques. Upon successful completion, the student may receive Fiber Optic Technician Certification from the Fiber Optic Association. 3 credit hours.

UST 186  Gas and Oil Pipeline Systems. This course provides an overview of the types of gas and oil pipeline systems. It includes real world applications and quality issues. 2 credit hours.

UST 190  Underground Utility Location. This course teaches proper methods to locate existing communication, electrical, gas, oil, wastewater, and water utility facilities. The student will be familiarized with the basic operation of underground utility location equipment. Missouri One Call procedures will also be taught. 3 credit hours.
**UST 216 Utility Internship.** This internship provides students with exposure to the day-to-day operations of a working utility. Students will be required to complete a minimum of two written assignments and fill out the required forms provided by the instructor. The instructor will check with students on the job to be sure that the requirements for the internship are being met. Prerequisites: UST 125, UST 150, UST 156, and UST 173 with a grade of “C” or better. 6 credit hours.

**UST 240 Water and Wastewater Systems.** This course provides an overview of the types of water and wastewater systems. It includes real world applications and quality issues. 2 credit hours.

**UST 260 Construction of Underground Utility Systems I.** This course develops a working knowledge of the construction specifications for buried and underground communications systems. Students will learn to recognize by sight and definition the various types of materials used in the construction of these systems. Students will be required to demonstrate working specification knowledge as well as correct procedures for the installation, repair, and removal of cables, conduit, utility pedestals, and access points. Students will also be exposed to fundamentals of natural gas pipeline systems. Site restoration is also covered. Safety procedures are emphasized and students are prepared to earn OSHA certifications such as Excavation & Trenching and Confined Space Entry. Prerequisite: UST 156 with a grade of “C” or better. 5 credit hours.

**UST 266 Construction of Underground Utility Systems II.** This course develops a working knowledge of the construction specifications for water and wastewater systems. Students will learn to recognize by sight and definition the various types of materials used in the construction of these systems. Students will be required to demonstrate working specification knowledge as well as correct procedures for the installation, repair, and removal of pipe, tracer wire, meters, valves, and access points. Site restoration is also covered. Safety procedures are emphasized and students are prepared to earn OSHA certifications such as Excavation & Trenching and Confined Space Entry. Prerequisites: UST 156, UST 171, and UST 190 with a grade of “C” or better. 5 credit hours.

**UST 275 Blueprint Reading and Jobsite Management.** This course is designed to develop students' ability to interpret utility system job design information such as blueprints, staking sheets, and maps. This course covers elevation profiles, offsets, and cut and fill profiles. Students will learn how to stake a project, select an effective approach to complete a project, and document changes for as-built project blueprints. This course also teaches job site management skills such as safety management; communicating with other employees, landowners, and on-site contractors; verifying permitting documents; performing site inspections; and completing required documentation. 2 credit hours.

**UST 299 Special Topics in Utility Systems.** Special Topics in Utility Systems may include instruction on topics not covered in other Utility Systems Technician (UST) courses. Topics covered in other UST courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
WELDING TECHNOLOGY

Classification of Instructional Programs - 48.0508

Associate of Applied Science Degree

Certificates
Entry-Level Welding Less than One-Year Certificate
Advanced-Level Welding One-Year Certificate

As long as there is metal, there will always be a need for qualified welders. Welding is the most common way of permanently joining metal parts. In this process, heat is applied to metal, melting and fusing it to form a permanent bond. Because of its strength, welding is used in shipbuilding, automobile manufacturing and repair, aerospace applications, and thousands of other manufacturing activities. Welding also is used to join beams when constructing buildings, bridges, railways, and other structures and to join pipes in pipelines, power plants, and refineries.

The program is located in a new facility built to American Welding Society (AWS) standards and equipped with state-of-the-art equipment such as a robotic welder, computer numerical control (CNC) plasma cutter, and multi-process data-tracking welders.

Today’s industries are using more advanced and modern technology that requires welders to have highly technical skills. CNC plasma cutting and robotic welding courses are designed to answer that call. Students receive project-based instruction that are aligned with today’s industry standards.

The Welding Technology degree program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE). The program is also certified by the American Welding Society (AWS) and structured to be flexible and provide students with the ability to obtain industry certifications while earning an Associate of Applied Science degree or certificate(s).

The degree program provides expert education to prepare students for both AWS School Excelling through National Skill Standards Education (SENSE) Entry and Advanced Welder certifications as well as other career skills required by industry such as safety, communications, blueprint reading, hoisting and rigging, mathematics, automation, inspection, and testing.

The Less than One-Year Certificate in Entry-Level Welding takes two semesters to complete and prepares students for the AWS SENSE Level I Entry Welder certification examinations and for entry-level welding employment.

A One-Year Certificate in Advanced-Level Welding may be sought once all Entry-Level Welding Certificate “Core Curriculum” and “Program Requirements” courses are completed with a grade of “C” or better. The Advanced-Level Welding Certificate takes three semesters to complete. Students who complete this certificate are prepared for the AWS SENSE Level II Advanced Welder certification examinations.
It is a graduation requirement of the Welding Technology (WLT) program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirement” courses.

To view program outcome data, visit https://www.statetechmo.edu/programs/industrialtech/wlt/wltfacts/.

**Program Mission**
The mission of the Welding Technology program is to provide students with education on state-of-the-art equipment and technology based on current industry standards to prepare them with the skills, knowledge, and attributes required for the completion of the AWS SENSE Level I Entry Welder and/or AWS SENSE Level II Advanced Welder certification(s) and employment in the welding technology field.

**Program Goals**
The goals of the program are to provide the opportunity for students to develop:
- Technical skills and knowledge required for manual and automated fabrication of precision weldments from ideas, drawings, and blueprints.
- Math skills necessary to compute the required measurements and formulas required for accurate fabrication or production of required parts.
- Knowledge and skills necessary to complete American Welding Society (AWS) Schools Excelling through National Skill Standards Education (SENSE) certifications.
- Effective communication and interpersonal skills.
- Analytical and problem solving skills required in the welding industry.
- Work ethic and attitudes that enhance the ability to secure and maintain increasingly meaningful employment.

**CORE CURRICULUM**

<table>
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<tr>
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<th>Course Title</th>
<th>Credit Hours</th>
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<td>Safety and Health of Welders</td>
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<tr>
<td>WLT 104</td>
<td>Hoisting &amp; Rigging</td>
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<tr>
<td>WLT 110</td>
<td>Drawing &amp; Welding Symbol Interpretation</td>
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</tr>
<tr>
<td>WLT 115</td>
<td>Welding Inspection and Testing</td>
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<tr>
<td>WLT 120</td>
<td>Thermal Cutting Processes I</td>
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<td>WLT 125</td>
<td>Thermal Cutting Processes II</td>
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<td>WLT 130</td>
<td>Shielded Metal Arc Welding I</td>
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<td>WLT 135</td>
<td>Shielded Metal Arc Welding II</td>
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<td>WLT 140</td>
<td>Gas Metal Arc Welding I</td>
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<td>WLT 145</td>
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<td>WLT 150</td>
<td>Flux Cored Arc Welding I</td>
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<td>WLT 155</td>
<td>Flux Cored Arc Welding II</td>
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<td>WLT 160</td>
<td>Gas Tungsten Arc Welding I</td>
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<td>WLT 165</td>
<td>Gas Tungsten Arc Welding II</td>
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<td>WLT 230</td>
<td>Shielded Metal Arc Welding III</td>
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<td>WLT 242</td>
<td>Gas Metal Arc Welding III</td>
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<td>WLT 252</td>
<td>Flux Cored Arc Welding III</td>
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<td>WLT 260</td>
<td>Gas Tungsten Arc Welding III</td>
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<td>Computer Numerical Control (CNC) Plasma Cutting I</td>
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<td>WLT 270</td>
<td>Computer Numerical Control (CNC) Plasma Cutting II</td>
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<td>WLT 280</td>
<td>Robotic Welding I</td>
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<td>WLT 285</td>
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**SUB-TOTAL** 47
GENERAL EDUCATION REQUIREMENTS

General Education Requirements 19
(see page 42-43)
May Not Include:
ASC 104 Human Anatomy and Physiology with Lab I 4
ASC 106 Human Anatomy and Physiology with Lab II 4
NST 101 Network Fundamentals 3

SUB-TOTAL 19

PROGRAM REQUIREMENT
EMS 104 Mathematics for Metalworking 2

SUB-TOTAL 2

GRADUATION REQUIREMENTS
COM 125 Job Search Strategies 1

SUB-TOTAL 1

It is a graduation requirement of the Welding Technology (WLT) associate of applied science degree program for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirement” courses.

PROGRAM TOTAL 69

WELDING TECHNOLOGY
Classification of Instructional Programs - 48.0508
Entry-Level Welding Less than One-Year Certificate

CORE CURRICULUM

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<tr>
<th>Course</th>
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<td>WLT 100</td>
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<td>WLT 140</td>
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</tr>
<tr>
<td>WLT 150</td>
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<tr>
<td>WLT 160</td>
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</table>

SUB-TOTAL 14

GENERAL EDUCATION REQUIREMENTS

General Education Requirements 6
(see page 42-43)
Must Include:
COM 111 Oral Communications 3
CPP 101 Introduction to Microcomputer Usage 3

SUB-TOTAL 6
PROGRAM REQUIREMENTS

<table>
<thead>
<tr>
<th>Course</th>
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<td>EMS 104</td>
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<tr>
<td>MAT 051</td>
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<td>OR MAT 071</td>
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SUB-TOTAL 6

GRADUATION REQUIREMENTS

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<th>Course</th>
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SUB-TOTAL 1

It is a graduation requirement of the Welding Technology (WLT) less than one-year certificate in entry-level welding for students to earn a grade of “C” or better in all “Core Curriculum” and “Program Requirements” courses.

PROGRAM TOTAL 27

WELDING TECHNOLOGY

Classification of Instructional Programs - 48.0508

Advanced-Level Welding One-Year Certificate

To qualify for this certificate, a student must have completed all Welding Technology – Entry-Level Certificate “Core Curriculum” and “Program Requirements” courses with a grade of “C” or better.

CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tr>
<td>WLT 125</td>
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<td>WLT 135</td>
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<tr>
<td>WLT 145</td>
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<td>WLT 285</td>
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SUB-TOTAL 33

GENERAL EDUCATION REQUIREMENTS

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>COM 101</td>
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<td>CPP 101</td>
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</table>

SUB-TOTAL 6
GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>COM</th>
<th>125</th>
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<tbody>
<tr>
<td>Job Search Strategies</td>
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</table>

SUB-TOTAL 1

It is a graduation requirement of the Welding Technology (WLT) one-year certificate in advanced-level welding for students to earn a grade of “C” or better in all “Core Curriculum” courses.

PROGRAM TOTAL 40

WLT 100 Safety and Health of Welders. This course teaches basic understanding of safe operations and practices in the work area, hot zone operation, precautions of working in confined spaces, and safe operation of equipment used for each welding and thermal cutting process. The proper use of personal protective equipment, precautionary labeling, and Material Safety Data Sheet (MSDS) information and inspection are also taught. The use and inspection of ventilation equipment are covered. The course prepares students for the AWS SENSE Safety and Health of Welders certification. 1 credit hour.

WLT 104 Hoisting & Rigging. This course teaches basic knowledge and skills required to set up and operate hoisting and rigging equipment. Hoisting hand signals and proper rigging applications are also covered. 2 credit hours.

WLT 110 Drawing and Welding Symbol Interpretation. This course teaches the basic knowledge and skills required to interpret basic drawing elements and welding symbols. Additionally, this course covers how to apply this information to the fabrication of components from a drawing. 1 credit hour.

WLT 115 Welding Inspection and Testing. This course teaches the basic skills and knowledge used to perform visual inspections of edge preparations, finished welds, and weld joint assemblies. Preparing and performing destructive tests on qualification samples are also covered. Various methods of non-destructive testing (NDT) used in the welding industry are introduced. 1 credit hour.

WLT 120 Thermal Cutting Processes I. This course teaches the basic skills and knowledge required to set-up and operate manual oxy-fuel cutting and welding equipment, plasma cutting equipment, and air carbon arc equipment as needed for the fabrication and preparation of materials. The course prepares students for AWS SENSE Level I welder performance qualification tests. 1 credit hour.

WLT 125 Thermal Cutting Processes II. This course provides students with continued development of the skills and knowledge used to set-up and operate manual and mechanized oxy-fuel cutting equipment, plasma cutting equipment, and air carbon arc equipment as needed for the fabrication and preparation of materials. The course prepares students for AWS SENSE Level II welder performance qualification tests. Prerequisite: WLT 120 with a grade of “C” or better. 1 credit hour.

WLT 128 Basic Welding. Basic principles and fundamentals of SMAW, Oxy-fuel (welding, cutting and brazing), GTAW and GMAW. 3 credit hours.

WLT 130 Shielded Metal Arc Welding I. This course teaches the basic skills and knowledge required to set-up Shielded Metal Arc Welding (SMAW) equipment, select correct electrodes, identify materials, and perform SMAW operations on carbon steel. The course prepares students for AWS SENSE Level I welder performance qualification tests in the flat and horizontal positions. 2 credit hours.

WLT 135 Shielded Metal Arc Welding II. This course provides students with continued development of the skills and knowledge used to set-up Shielded Metal Arc Welding (SMAW) equipment, select correct electrodes, identify materials, and perform SMAW operations on structural carbon steel. The course prepares students for AWS SENSE Level I welder performance qualification tests in the vertical and overhead positions. Prerequisite: WLT 130 with a grade of “C” or better. 2 credit hours.
WLT 140  Gas Metal Arc Welding I. This course teaches the basic skills and knowledge required to set-up Gas Metal Arc Welding (GMAW) equipment, select correct electrodes, identify materials, and perform GMAW operations on carbon steel. The course prepares students for AWS SENSE Level I welder performance qualification tests in the flat and horizontal positions. 2 credit hours.

WLT 141  CAT Welding. This course is designed to acquaint the student with more common welding techniques and equipment used currently in trades and industry. Consideration is given to welding with arc and oxyacetylene in various positions, hard surfacing, brazing, cutting, electrode selection and metal identification. The student is expected to develop basic skills in general welding. 2 credit hours.

WLT 145  Gas Metal Arc Welding II. This course provides students with continued development of the skills and knowledge used to set-up Gas Metal Arc Welding (GMAW) equipment, select correct electrodes, identify materials, and perform GMAW operations on structural carbon steel. The course prepares students for AWS SENSE Level I welder performance qualification tests in the vertical and overhead positions. Prerequisite: WLT 140 with a grade of “C” or better. 2 credit hours.

WLT 150  Flux Cored Arc Welding I. This course teaches the basic skills and knowledge required to set-up Flux Cored Arc Welding (FCAW) equipment, select correct electrodes, identify materials, and perform FCAW operations on carbon steel. The course prepares students for AWS SENSE Level I welder performance qualification tests in the flat and horizontal positions. 2 credit hours.

WLT 155  Flux Cored Arc Welding II. This course provides students with continued development of the skills and knowledge used to set-up Flux Cored Arc Welding (FCAW) equipment, select correct electrodes, identify materials, and perform FCAW operations on structural carbon steel. The course prepares students for AWS SENSE Level I welder performance qualification tests in the vertical and overhead positions. Prerequisite: WLT 150 with a grade of “C” or better. 2 credit hours.

WLT 160  Gas Tungsten Arc Welding I. This course teaches the basic skills and knowledge required to set-up Gas Tungsten Arc Welding (GTAW) equipment, select correct electrodes, identify materials, and perform GTAW operations on carbon steel. The course prepares students for AWS SENSE Level I welder performance qualification tests in the flat and horizontal positions. 2 credit hours.

WLT 165  Gas Tungsten Arc Welding II. This course provides students with continued development of the skills and knowledge used to set-up Gas Tungsten Arc Welding (GTAW) equipment, select correct electrodes, identify materials, and perform GTAW operations on structural aluminum, and carbon and stainless steel. The course prepares students for AWS SENSE Level I welder performance qualification tests in the vertical and overhead positions. Prerequisite: WLT 160 with a grade of “C” or better. 2 credit hours.

WLT 225  Welding and Fabrication for High Performance Vehicles. This course teaches welding and fabrication for high performance motorsports. It includes bending, notching, and designing roll cages and frames using mild steel tubing, chrome-moly tubing, and aluminum. The welding processes used are GTAW and GMAW. Corequisite: WLT 128 with a grade of “C” or better. 2 credit hours.

WLT 230  Shielded Metal Arc Welding III. This course teaches advanced Shielded Metal Arc Welding (SMAW) operations on carbon and stainless steel. Carbon steel pipe welding is also covered. The course prepares students for AWS SENSE Level II welder performance qualification tests. Prerequisites: WLT 135 with a grade of “C” or better and AWS SENSE Level I Certification. 4 credit hours.

WLT 242  Gas Metal Arc Welding III. This course teaches how to use Gas Metal Arc Welding (GMAW) and Pulse Gas Metal Arc Welding (GMAW-P) equipment to perform advanced operations on aluminum, and carbon and stainless steel. Carbon steel pipe welding is also covered. The course prepares students for AWS SENSE Level II welder performance qualification tests. Prerequisites: WLT 145 with a grade of “C” or better and AWS SENSE Level I Certification. 3 credit hours.
WLT 252 Flux Cored Arc Welding III. This course teaches advanced Flux Cored Arc Welding (FCAW) and Flux Cored Arc Welding-Self Shielding (FCAW-S) operations on carbon steel. Carbon steel pipe welding is also covered. The course prepares students for AWS SENSE Level II welder performance qualification tests. Prerequisites: WLT 155 with a grade of “C” or better and AWS SENSE Level I Certification. 3 credit hours.

WLT 260 Gas Tungsten Arc Welding III. This course teaches advanced Gas Tungsten Arc Welding (GTAW) and Gas Tungsten Arc Welding-Pulsed (GTAW-P) operations on aluminum, and carbon and stainless steel; pipe welding is also covered. The course prepares students for AWS SENSE Level II welder performance qualification tests. Prerequisites: WLT 165 with a grade of “C” or better and AWS SENSE Level I Certification. 4 credit hours.

WLT 265 Computer Numerical Control (CNC) Plasma Cutting I. This course teaches the history and safe operation of CNC plasma cutting systems. Fundamental G-Code programming and the operation of a CNC plasma cutting machine with related software and coordinate systems are taught. Prerequisite: WLT 125 with a grade of “C” or better. 2 credit hours.

WLT 270 Computer Numerical Control (CNC) Plasma Cutting II. This course teaches the use of visual machine designer software to program the tool path. Students will use the computer aided drafting (CAD) software for the plasma cutting system to build a basic CAD project. Prerequisite: WLT 265 with a grade of “C” or better. 3 credit hours.

WLT 280 Robotic Welding I. This course teaches the safe set-up and operation of the robotic welding system. Students are taught to identify the variables that affect the robotic welding system, set-up the system parameters, and operate within those parameters. Prerequisite: WLT 242 with a grade of “C” or better. 2 credit hours.

WLT 285 Robotic Welding II. This course teaches how to design, set-up, and run programs for the robotic welding system consistent with industry standards. Students are also taught to evaluate, inspect, and test the overall finished project quality to American Welding Society (AWS) standards. Prerequisite: WLT 280 with a grade of “C” or better. 3 credit hours.

WLT 299 Special Topics in Welding Technology. Special Topics in Welding Technology (WLT) may include instruction on topics not covered in other WLT courses. Topics covered in other WLT courses may also be covered in more depth in this special topics course. Projects may be undertaken in any area related to the major program with credit hours determined by the level and amount of involvement. The minimum involvement required for one credit is 30 contact hours. The specific topic(s), objectives, plan of instruction, and evaluation criteria must be documented in the syllabus; approved by the Department/Division Chair; and filed in the Academic Records Office. Students may complete more than one Special Topics course, provided that the credits earned in this manner do not exceed a total of four (4) credits. 1-4 credit hours.
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