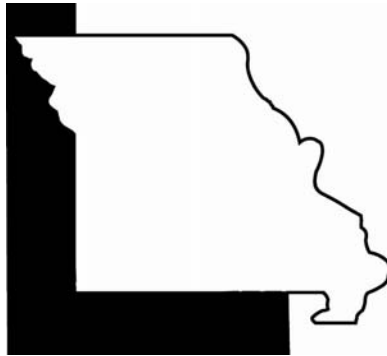


LINN STATE TECHNICAL COLLEGE

2008 – 2009

CATALOG



One Technology Drive
Linn, MO 65051
573.897.5000
800.743.8324
www.linnstate.edu



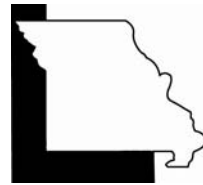
Every effort has been made to ensure the accuracy of the information available at the time this catalog was prepared. All information is subject to change at any time by proper administrative processes without prior notice, obligation or liability. This includes statements of tuition, fees, programs, course offerings and graduation requirements.

LINN STATE TECHNICAL COLLEGE

GUARANTEE

Linn State Technical College 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 Linn State Technical College 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.



GREETINGS AND WELCOME . . . **FROM LINN STATE TECHNICAL COLLEGE**

Greetings and welcome to Linn State Technical College. Since its founding in 1961 as part of a local school district and its transfer to the State of Missouri in 1996, more than



Dr. Donald M. Claycomb
President

9,000 individuals have graduated from the college. The college mission is to “prepare students for profitable employment and a life of learning.” Linn State Technical College has strong relationships with business and industry and prides itself on its reputation for producing graduates with the skills, knowledge, and attitudes needed for advancement in the workplace. The values and institutional goal statements included in the mission package of Linn State Technical College reflect a strong commitment to serving our students and the economic interests of the State of Missouri. Understood in these values and goals are the concepts of student access, cost

effectiveness, quality and responsiveness to industry which clearly shapes the planning and delivery of our college services and programs.

We are proud to be the only publicly-supported higher education institution in Missouri with a statewide charge to be devoted solely to technical education at the associate degree level. We invite you to join us and become a member of the Linn State family.

LINN STATE TECHNICAL COLLEGE

ACADEMIC CALENDAR

Academic Year

FALL SEMESTER	2007-2008	2008-2009	2009-2010	2010-2011
Orientation/Welcome Bash	August 20, 2007	August 25, 2008	August 24, 2009	August 23, 2010
Fall Semester Begins	August 21	August 26	August 25	August 24
Labor Day/No Classes	September 3	September 1	September 7	September 6
Advisory Council/No Classes	October 4	October 2	October 1	September 30
Free Day/No Classes	October 5	October 3	October 2	October 1
Thanksgiving/No Classes	November 22-23	November 27-28	November 26-27	November 25-26
Finals	December 11-12	December 16-17	December 15-16	December 14-15
Finals/Fall Semester Ends	December 13	December 18	December 17	December 16
Winter Break Begins	December 14	December 19	December 18	December 17

SPRING SEMESTER				
Spring Semester Begins	January 8, 2008	January 6, 2009	January 5, 2010	January 4, 2011
Martin Luther King Day/No Classes	January 21	January 19	January 18	January 17
Presidents' Day/No Classes	February 18	February 16	February 15	February 21
Advisory Council/No Classes	March 6	March 6	March 5	March 4
Spring Break/No Classes	March 17-21	March 16-20	March 15-19	March 14-18
SkillsUSA Contest/No Classes	April 4	April 3	To Be Determined	To Be Determined
Free Day/No Classes	March 7	April 10	April 2	April 22
Finals	May 6-7	May 5-6	May 4-5	May 3-4
Finals/Spring Semester Ends	May 8	May 7	May 6	May 5
HEO Classes End	May 8	May 7	May 6	May 5
Commencement	May 9	May 8	May 7	May 6

SUMMER SEMESTER				
Summer Semester Begins	May 15, 2008	May 14, 2009	May 13, 2010	May 12, 2011
Memorial Day/No Classes	May 26	May 25	May 31	May 30
HEO Classes Begin	June 9	June 1	June 7	June 6
Independence Day/No Classes	July 4	July 3	July 5	July 4
Finals	August 18	August 17	August 16	August 15
Finals/Summer Semester Ends	August 19	August 18	August 17	August 16

The college academic calendar is subject to change.

Approved - April 18, 2008 by the Linn State Technical College Board of Regents.



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ABOUT THE COLLEGE

MISSION

Linn State Technical College (LSTC) prepares students for profitable employment and a life of learning.

VISION

Linn State Technical College, 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 College, 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 certificates and associate degrees. In 1995, statutory re-definition, 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. **This legislation states that "the controlling purpose of LSTC is to prepare students for profitable employment."**

VALUES

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

- A common foundation of knowledge and understanding by supporting a strong general education core.
- Development and support of the professional, educational and personal needs, interests, and capabilities of each student.
- Small class size to facilitate individual attention.
- Responsibility and leadership in service for the common good of the state.
- Open communication and teamwork among students, faculty and staff.
- Ethical and professional behavior.
- An academic environment fostering continued growth, academic freedom and professional development of faculty and staff through a life of learning.
- Development of critical thinking and problem solving skills through an appropriate mix of theory and application.
- Continued improvement of student learning through assessment.
- Appreciation and encouragement of diverse student, faculty and staff populations.
- Responsiveness to the economic development needs of the state of Missouri.
- Collaboration with business, industry and other educational institutions to strengthen partnerships and ensure a learning environment that adjusts to global changes.
- State of the art laboratories that demonstrate work environments.

INSTITUTIONAL GOAL STATEMENTS

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

1. Mission Review and Implementation
 - Systematically evaluate the extent to which the institution is meeting its higher education mission.
 - Assure achievement of stated objectives.
 - Periodically review, and if needed, revise the college mission documents.
 - Continuously undertake improvement initiatives with measurable goals and outcomes.
2. Organization and Governance
 - Maintain an institutional environment with faculty and staff participation in the decision-making process.

3. Policies and Procedures
 - Develop, implement, and systematically evaluate policies and procedures that clearly define relationships involving students, faculty, staff, Board of Regents and other external stakeholders.
4. Curriculum
 - Provide academic opportunities that are relevant to the changing needs of industry.
 - Maintain and assess academic programs to ensure excellence.
 - Integrate general education into the technical education curriculum.
5. Instruction
 - Provide instruction that is responsive to the needs of the changing population of students and their learning needs.
 - Provide instruction that acquaints students with a variety of cultures.
 - Utilize the most appropriate teaching techniques and current technology.
 - Maintain a low student to faculty ratio.
 - Systematically assess instruction, equipment and facilities to achieve improvements in learning.
 - Provide academic support through the Library and Academic Resource Center.
6. Student Services and Activities
 - Support services and activities that enhance the cultural development and citizenship of students.
 - Support a comprehensive course placement and counseling program to assist students in making career decisions.
 - Support experiences that foster leadership and community participation among students.
 - Support appropriate diversity goals which are protective of the dignity of individuals.
 - Recruit, retain and develop students with diverse cultural and ethnic backgrounds.
7. Human Resources
 - Recruit, retain, and develop exceptional faculty, and staff with diverse cultural and ethnic backgrounds.
 - Cultivate a faculty whose qualifications include current technical expertise balanced with appropriate formal education.
8. Campus and Facilities
 - Build and maintain physical facilities designed to support educational programs and instructional technology of the highest quality.
 - Design and maintain safe and effective laboratories, work stations, and equipment.
 - Develop and maintain an effective technology infrastructure to support both education and administration functions.
9. Finances
 - Obtain, from both public and private sources, adequate financial support to accomplish its mission.
 - Demonstrate fiscal responsibility and good stewardship of fund management.
10. Assessment of Student Learning
 - Evaluate employer and alumni satisfaction.
 - Collect dependable data, which will give sufficient evidence to support continuous improvement of student learning.
 - Evaluate student learning in the technical areas.
 - Evaluate student learning in the general education areas.
11. Student Learning Outcomes
 - Demonstrate proficiency in using effective oral and written communication skills.
 - Demonstrate proficiency in using a higher level of critical thinking and problem solving processes.
 - Demonstrate proficiency in utilizing the technology relevant to the learner's discipline.
 - Demonstrate an awareness of appropriate interaction in a diverse place of work.
12. Partnerships
 - Provide general and technical education that is transferable first to the workplace then to baccalaureate programs.
 - Develop and/or maintain partnerships, with business and industry, the surrounding community, and other educational institutions that enhance the transfer of appropriate information and technology throughout the state.

13. Positioning for the Future

- Engage in both operational and strategic planning to continually improve the institution as it strives to address its mission.
- Provide a learning environment that adjusts to global changes.
- Maintain effective connections with business, industry, higher education, and other stakeholders, to keep pace with advances in technology, the economy, and the society as a whole, in order that the college will plan for and adapt to changes that will keep the college responsive and viable.

THE HIGHER LEARNING COMMISSION ACCREDITATION

Linn State Technical College is accredited by The Higher Learning Commission and is a member of the North Central Association.



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 Linn State Technical College are hereby notified that Linn State Technical College is committed to nondiscrimination and equal opportunities in its admissions, educational programs, activities and employment regardless of race, color, sex, religion, gender, sexual orientation, national origin, ancestry, age, disability or status as a disabled Vietnam-era veteran and shall take action necessary to ensure nondiscrimination.

Any person having inquiries concerning Linn State Technical College 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 Dean of Students by telephone at (573) 897-5193 or by mail at Linn State Technical College, One Technology Drive, Linn, MO 65051. The Dean of Students 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.

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. The telephone number is (816) 268-0550 and fax number is (816) 823-1404. Telecommunication Device for the Deaf: 800-437-0833. E-mail: OCR.KansasCity@ed.gov and Website: <http://www.ed.gov/ocr>.

Report all Equal Rights Questions to the Dean of Students. It is the policy of Linn State Technical College not to discriminate on the basis of race, color, national origin, religion, sex, age or handicap in its educational programs, activities or employment as required by Title IX and Section 504 and other applicable legislation. As a student of Linn State Technical College, you are protected from discrimination in the following areas.

As a student, you may not be discriminated against on the basis of race, color, national origin, religion, sex, age or handicapping conditions in:

- Admission
- Access to enrollment in courses
- Access to, and use of, school facilities
- Counseling and guidance materials, tests, and practices
- Vocational education
- Graduation requirements
- Student rules, regulations, and benefits
- Treatment as a married and/or pregnant student

Housing
Financial Assistance
Placement Services
School-sponsored extracurricular activities
Student Honors
Other aid, benefits or services

If you believe you have been discriminated against on the basis of race, color, national origin, religion, sex, age or handicapping conditions, you may make a claim that your rights have been denied. This claim or grievance may be discussed with the Counseling Services Staff. If it is still felt that there is a Civil Rights Discrimination Grievance, see the Dean of Students at once. The student will be asked to write down the actions, policies, or practices, which are believed to be discriminatory. Forms are available from the Dean of Students, as well as assistance in completing them. Assistance is also available from other Counseling Services Staff. Once the grievance is filed, the complainant will be asked to meet with those persons who would be involved in correcting the policies, practices, or programs that are believed to discriminate. If there is agreement that student has been discriminated against, corrective action will be taken to restore his/her rights. If there is no agreement, he/she may appeal the grievance to a person with higher authority than the Dean of Students or, ultimately, on to the President of Linn State Technical College. See section on Complaints and Grievances in the Student Handbook at www.linnstate.edu/current/pdfs/StudentHandbook.pdf.

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 Linn State Technical College grievance process is filed; or without using the Linn State Technical College 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 Dean of Students. The Counseling Services Staff or Dean of Students will supply the current Office of Civil Rights address. If a complaint is filed with Linn State Technical College, the student will have a year to file the paperwork.

In preparing a discrimination grievance, detail the following:

- The exact nature of the grievance.
- How the student believes he/she may have been discriminated against.
- Persons believed to be responsible.
- The date(s), time(s), and place(s) of the grievance.
- The names of witnesses or people who have knowledge about the grievance.
- Any available written documentation or evidence that is relevant to the grievance.
- The actions that could be taken to correct the grievance.

Any person having inquiries concerning Linn State Technical College compliance with the regulations implementing Title VI of Civil Rights Act of 1964, Title IX of the Education Amendments of 1972 or Section 504 of the Rehabilitation Act of 1973 or the Americans with Disabilities Act of 1990 is directed to contact the Dean of Students by telephone at (573) 897-5193 or by mail at Linn State Technical College, One Technology Drive, Linn, MO 65051. The Dean of Students is responsible for coordinating the institution's effort to comply with the regulations implementing Title VI, Title IX and Section 504 and the Americans with Disabilities Act.

ADVISORY COUNCIL

The Linn State Technical College Advisory Council is composed of individuals representing a cross section of business and industry who are dedicated to keeping technical education informed of industry's requirements. The Advisory Council, composed of each program's advisory committee, makes recommendations to the college regarding industry standards and expectations, curriculum, technical requirements, and assessment benchmarks.

FACILITIES AND RESOURCES

Classrooms and Laboratories. The main campus of the college is located on a 249-acre site one mile east of Linn along US Highway 50 in central Missouri, 25 miles east of Jefferson City. Three programs are offered at off-campus locations – Physical Therapist Assistant located at the Capital Region Medical Center in Jefferson City, Missouri and Automation & Robotics Technology and Nuclear Technology are located in Mexico, Missouri at the Advanced Technology Center.

Main Campus. The main campus consists of nine academic buildings, a student housing complex and an airport. The newest building on the main campus is the 93,000 square foot Information Technology Center (ITC). In addition to housing technical programs and general education, this building provides critical support services such as library and academic support services as well as the bookstore and cafeteria. 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 Linn State Technical College students. Rooms are single-or double-occupancy with private bath. Rooms are furnished with beds, desks, desk lamps, closets, a Micro-Fridge, Internet access, local cable, and telephone connections.

The newly constructed 72,000 square foot activity center opened its doors in January 2008. The main level includes three regulation size basketball courts, a fitness center, snack bar, locker rooms, and arcade area. The second level will have an elevated three lane walking/running track. The basement of the facility will serve 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, and a 10-unit nested T-hanger for public rental.

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.

Physical Therapist Assistant Program (PTA). The PTA program is located in Jefferson City, Missouri at the Capital Region Medical Center. The PTA program mailing address at Capital Region Medical Center is P.O. Box 1128, Jefferson City, MO 65102.

Advanced Technology Center (ATC). The ATC is jointly owned by Linn State Technical College (LSTC) and Moberly Area Community College (MACC) and is operated as a cooperative among LSTC, MACC, the University of Missouri Outreach and Extension, and the City of Mexico. The main building and the Christopher S. Bond Annex total 57,000 square feet located on 8.75 acres in Mexico, Missouri. Within the ATC, over 15,000 square feet of laboratory space is dedicated solely to support LSTC programs that include Automation & Robotics Technology and Nuclear Technology. An Executive Committee comprised of members from the four cooperative partners has oversight responsibilities of ATC operations. The ATC is located at 2900 Doreli Lane, Mexico, MO 65265. The ATC phone number is (573) 582-0817, and the website is www.atc.org.

Osage County Community Center. The Osage County Community Center is adjacent to Linn State Technical College. 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. The building has cable, satellite downlink, telephone conferencing and video conferencing capabilities, as well as full Internet connection. 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 the Foundation for Linn State Technical College.

The Foundation for Linn State Technical College. The Foundation for Linn State Technical College is a not-for-profit 501(c)(3) tax-exempt organization. It is the college's principle fundraising organization. Gifts to the college come in many forms, including direct cash contributions, and in-kind donations of equipment, property and bequests.

Formed in 1983 by friends and supporters of the college, the Foundation is dedicated solely to the advancement of Linn State Technical College. It serves the college by helping acquire and manage the private financial contributions, gifts and grants that are critical to preserving the unique educational experience that Linn State Technical College provides. Contributors recognize the important impact of the college. They understand the difference it makes in the lives of others and the role it plays in providing future economic growth and opportunity.

The Foundation is led by a volunteer board of dedicated professionals who help manage the many endowments, grants, scholarships and other gifts received. As a 501(c)(3) not-for-profit organization, contributions to the Foundation are deductible to the extent allowed by law.

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 Linn State Technical College, One Technology Drive, Linn, MO 65051, or call (573) 897-5136.

GENERAL ADMISSIONS POLICY AND PROCEDURES

ADMISSIONS POLICY

Linn State Technical College is an open admission institution. All students with a diploma from an accredited high school or GED will be accepted into the college. "All students" includes all full-time credit-seeking students, all part-time credit-seeking students taking more than nine hours, certificate students, transfer students, students whose origin is out-of-state or out-of-country, and other special admissions students.

Admission of a student to a program at Linn State Technical College will be based on minimum scores on an appropriate college-level admissions test, meeting program specific requirements, and program availability. Students may be placed in developmental courses based on college-level admissions test results.

CAMPUS TOURS

Prospective students and their families are strongly encouraged to visit Linn State Technical College before enrolling for classes. The best time for individual tours is between the hours of 9 a.m. and 2 p.m. Monday through Friday. To schedule a tour or request information, contact the Office of Admissions at 1-800-743-8324.

HIGH SCHOOL CURRICULAR RECOMMENDATION UNTIL 2010

Linn State Technical College recommends the Coordinating Board for Higher Education Minimum CORE Curriculum for its entering first-year students until 2010:

Units/Years and Course Areas

- ◆ Four (4) units of English (Composition, Literature)
- ◆ Three (3) units of Mathematics (Algebra I, Algebra II, Geometry, Trigonometry, Math Analysis, Calculus)
- ◆ Three (3) units of Social Studies (World History, American History, American Government, Economics, Psychology)
- ◆ Two (2) units of Science (Biology, Chemistry or Physics, one of which is a laboratory course)
- ◆ One (1) unit of Visual and Performing Arts (Art I, II, III and IV; Sculpture, Dramatics, Band, Chorus)
- ◆ Three (3) units of Core Electives selected from foreign language and/or combinations from 2 or more of the course areas above.

HIGH SCHOOL CURRICULAR RECOMMENDATION STARTING IN 2010

Starting in 2010 Linn State Technical College recommends the following revised Coordinating Board for Higher Education Minimum 24-unit High School CORE Curriculum for its entering first-year students:

- ◆ English/Language Arts 4 units
- ◆ Social Studies 3 units
- ◆ Mathematics 3 units
- ◆ Science 3 units
- ◆ Fine Arts 1 unit
- ◆ Additional Coursework 3 units
- ◆ Electives 7 units

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 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 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 – 3 units

- ◆ Mathematics coursework 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 3 additional units in grades 9-12.
- ◆ Coursework not acceptable for the high school core curriculum emphasizes pre-algebra, computer math/programming, consumer/basic math, or business math/accounting.

Science – 3 units

- ◆ Science coursework 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 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.

Additional Coursework – 3 units

- ◆ 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).

Electives – 7 units

- ◆ All students should complete at least 3 elective units total 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.

ADMISSIONS PROCEDURES

Every prospective student will work with an Admissions Representative or Recruiter. This person works with the prospective student throughout the testing, application, and registration process. He/she is the prospective student's personal contact with the college and is available to assist the prospective student with his/her transition to college life. Contact the Office of Admissions at 1-800-743-8324. Prospective students may apply online at www.linnstate.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. Applicants who do not meet the admissions requirements for their desired program, may be reviewed by an admissions committee. If the admissions committee determines that the student does not have the skills needed for success in a particular program, the student may apply for alternative programs for which the criteria are met or develop a plan for the purpose of achieving the minimum scores required for admission to the desired program. Any applicant who has questions concerning the admissions procedures should call the Office of Admissions.

RESIDENT STATUS

In accordance with Missouri state law and with the policy set forth by the Missouri Coordinating Board for Higher Education (Missouri Register, 6CSR 10-3.010 Determination of Student Residency), no student who is a U.S. citizen shall be eligible to register as a resident of the State of Missouri and pay in-state tuition unless he/she is a bona fide resident of the state. A student who has moved to Missouri for the primary purpose of obtaining a higher education shall not be considered a bona fide resident of the state and will pay out-of-state tuition. The burden of proof of resident status shall be upon the applicant. To be eligible for in-state tuition rates, the student must meet state statutory requirements, which include:

- ◆ Attesting to Missouri residency for the previous twelve (12) months on the Linn State Technical College 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: A person classified as a non-resident upon his/her first enrollment will continue to be classified as a non-resident for the duration of his/her enrollment. 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 Linn State Technical College 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 of proficiency from Linn State Technical College.

Application Requirements

- ◆ Complete the Linn State Technical College Application for Admission.
- ◆ Education Record – Submit all that apply to you:
 1. Official eight-semester transcript from an accredited high school
 - ✓ High school students will be given tentative admission based on a sixth or seventh semester transcript.
 - ✓ A final transcript must be submitted after graduation.

OR

2. Official passing GED score report.
 - ✓ GED graduates and/or home-schooled students should request that an official copy of their GED scores be sent to the Office of Admissions directly from the state department of education in the capital city of the state in which they tested.

OR

3. Official college transcript(s) with at least 24 semester credits from an accredited higher education institution. If the applicant has earned less than 24 college semester credits, submit both the official college transcript and an official high school transcript or official passing GED score report.
- ◆ Provide ACT, SAT or COMPASS test scores.
 1. Test scores are used for course placement and program admittance.
 2. Results from these tests must be less than five years old. The COMPASS test is offered on the Linn State Technical College campus for a nominal fee. Contact the Office of Admissions to schedule a test appointment. 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.
 - ◆ 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 Linn State Technical College.

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

Students who are admitted without a major 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 their desired degree program.

International Students

An international student is a foreign-born person, who is not a citizen, national or permanent resident of the United States. 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:

- ◆ Complete the Linn State Technical College 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 of the transcript must be submitted in addition to the original.
 2. Students transferring from another U.S. college or university need to submit their current I-20, I-94 and visa.

- ◆ 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 or COMPASS test scores.
 1. Test scores are used for course placement and program admittance. For information about taking an arranged ACT test, visit www.actstudent.org/pdf/arranged.pdf.
 2. Results from these tests must be less than five years old. The COMPASS test is offered on the Linn State Technical College campus for a nominal fee. Contact the Office of Admissions to schedule a test appointment. 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 experience at an accredited U.S. college or university, he/she may have testing waived per the discretion of the Director of Admissions.
- ◆ Provide evidence of English language proficiency:
 1. 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 500 or better on the Test of English as a Foreign Language (TOEFL). Submit official test report.
 - ✓ A score of 5 or better on the International English Language Testing System (IELTS).
 - ✓ Completion of 60 semester hours of satisfactory academic work in a regionally accredited U.S. college or university. Submit official transcript.

NOTE: International students will be required to submit evidence of health and accident insurance prior to enrollment. In addition, international students must pay all fees necessary for issuing the I-20.

International students may be eligible for internal tuition waivers provided by Linn State Technical College.

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 Linn State Technical College Non-Degree Seeking Application for Admission.
- ◆ May take credit, non-credit and/or dual credit classes on a space-available basis.
- ◆ Are not eligible for federal financial aid.

If the non-degree seeking student wishes to take math or communications classes at anytime during enrollment, the student must provide ACT, SAT or COMPASS test scores.

1. Test scores are used for course placement and program admittance.
2. Results from these tests must be less than five years old. The COMPASS test is offered on the Linn State Technical College campus for a nominal fee. Contact the Office of Admissions to schedule a test appointment. 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 Linn State Technical College, he or she must complete the Linn State Technical College 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. Linn State Technical College is committed to providing access to everyone who can benefit from a program of higher education. The cost of attending Linn State Technical College varies depending on in-state residency; whether or not one lives on campus; or the instructional program of study one pursues and other services needed. The following Student Financial Aid section defines the types of financial assistance available. This assistance can help provide students with the financial support needed for tuition, housing, books and other educational items, but is not intended to completely fund their education.

Costs are incurred on the date of registration. Failure to complete appropriate paperwork for withdrawals during the first week of classes will result in a financial obligation to the college.

Refer to the Linn State Technical College website at www.linnstate.edu/admissions/fees.asp or call the Cashier at (573) 897-5121 for current tuition, fees and other costs.

TUITION

Tuition is determined by the student's residency classification and the number of semester hours of enrollment. College fees, miscellaneous fees and costs are subject to change without notice by action of the Linn State Technical College Board of Regents.

FEES

The number of credit hours for which students are enrolled each semester determines the amount of student fees they are assessed. Funds from student fees support student activities, intramural sports, student publications, graduation, parking and other student support services.

Course/laboratory fees are assessed for specific courses to cover the cost of course-specific equipment and supplies.

Books, supply and tool costs vary by program. Contact the Linn State Technical College Bookstore at (573) 897-5124 for current costs.

Some programs require uniforms. Refer to the Linn State Technical College website at www.linnstate.edu/admissions/fees.asp or call the Cashier at (573) 897-5121 for current uniform costs

BOOKSTORE

Textbooks are required for most Linn State Technical College classes. The Linn State Technical College Bookstore, located in the lower level of the Information Technology Center, is a full-service bookstore that sells required textbooks, tools, supplies, clothing, novelties and sundries. The cost of textbooks and tools varies by class and instructional program. A 10% non-refundable deposit is required on all tool orders. The Bookstore is open from 7:00 a.m.–4:00 p.m. Monday through Friday. For more information call (573) 897-5124.

HOUSING

On-campus student housing is available. Rooms are available as single- or double-occupancy. On-campus housing residents must purchase a meal plan. Refer to the Linn State Technical College website at www.linnstate.edu/admissions/fees.asp or call the Resident Manager at (573) 897-5165 for current cost information.

MEAL PLANS

Meal plans may be purchased during the first four weeks of each semester. Changes to meal plans can be made only during the first two weeks of each semester by completing a request form available from the Cashier. Your student ID card serves as your meal plan card.

Housing students contact the Resident Manager to sign-up for or change a meal plan. Students with required internships may contact the Resident Manager for a housing rate adjustment.

Commuter students contact the Cashier in the Nilges Technology Center to sign up for or change a meal plan.

Funds remaining on your meal plan each semester will be carried forward to the next semester with the exception of spring to summer semesters. A meal plan must be purchased at the beginning of each semester to increase the meal plan balance.

PAYMENT OF TUITION AND FEES

Payment of tuition and fees is due by the first day of the semester. Payment may be made by Visa, MasterCard, Discover or American Express, personal check, cashier's check, US Money Order or cash. No credit card charges under five (\$5.00) dollars will be processed. Students may choose 100% payment or a payment plan offered through the college. If the student's account is 30 days past due and the student has not made payment arrangements with the college, registration will be voided. The student will be responsible for all charges incurred. A finance charge of 2% will be applied to all past due accounts. Incomplete financial aid will not be calculated in the balance due. Finance charges will apply to all accounts with a balance due. Delinquent accounts will be turned over to a collection agency. A collection fee may be added to the balance.

Interest-Free Monthly Payment Option. Linn State Technical College understands that education expenses are easier to pay when spread over predictable, interest-free monthly payments. Our Interest-Free Monthly Payment Option Plan is an alternative to large annual or term payments and helps limit borrowing. The Interest-Free Monthly Payment Option Plan is available for a small enrollment fee. Only tuition and fees are eligible expenses for the payment plan. Late fees will be assessed if payments are not received by the 10th of each month. To participate in the payment plan offered by the college, please contact the Cashier located in the Nilges Technology Center. A fee of \$35.00 must accompany the payment plan form.

Third-Party Billing. Third-party billing is a payment agreement among the student, college and a student sponsor. The sponsor is an outside source that takes responsibility for all or partial payment of tuition, fees, books, etc. A third-party sponsor is not an individual, i.e. parent, grandparent, etc., but a company or agency such as Military, Vocational Rehabilitation, Training Rehabilitation Act (TRA), Workforce Investment Act (WIA), or other state agencies. The college will not bill third party agencies for class re-takes unless the student contacts the agency for payment approval.

The Business Office must receive written approval from the sponsor for each semester the student attends Linn State Technical College. An invoice will be sent to the sponsor after the add/drop period is over. If the sponsor fails to respond to the bill by the given due date, the charges are reversed back to the student's account for payment by the student. The sponsor will receive the refund or credit for any reduction of fees that were originally billed.

Personal Check Policy. Registered students may cash personal checks, second-party checks from immediate relatives, cashier's checks, or US Money Orders up to \$20, (one check per day) at the Cashier's window in the Nilges Technology Center.

Any student who presents a personal check that is returned by the bank to Linn State Technical College unpaid will be charged a \$40 fee and may thereafter be required to pay all fees by cash, US Money Order, cashier's check or approved credit card. Students not redeeming the check promptly after notification of its return 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 cash any check deemed questionable.

REFUNDS

Class Refund. To receive a refund when dropping a class or classes, a Special Student Schedule Form must be completed and submitted to the Academic Records Office. This form is available in the major departments and the Academic Records Office. The date of receipt of the form in the Academic Records Office is used to determine eligibility for refunds and/or final approval of the classes dropped. Students who never attend, or cease to attend, any class in which they have enrolled may be administratively withdrawn upon recommendation of an instructor or staff member with the approval of a Dean or Vice President. A student also may be withdrawn from a class by administrative action as a result of disciplinary procedures. The student may be financially responsible for charges incurred.

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

All refund percentages are based on 100% payment. Students who drop class(es) will receive partial refunds according to the following schedule:

16-Week Class:

- ✓ 1st week of class 100% Refund
- ✓ 2nd week of class..... 50% Refund
- ✓ 3rd week of class 25% Refund
- ✓ After 3rd 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 at any time of the semester for approved section changes. 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.
- ◆ Refunds on sales paid by check will not be processed until 20 days from date of sale.

Fees that are not refundable include:

- ✓ Advanced Technology Fee
- ✓ Meal Plans
- ✓ Parking Fees
- ✓ Self-paced Math (SPM) Course Fees
- ✓ Seminar Fees
- ✓ Uniform Fees
- ✓ Web-based Course Tuition

Student Housing Refunds. Please consult the current housing agreement for policy regarding housing refunds. A copy of this agreement may be obtained from the Resident Manager.

Credit Balance Refunds. No refund will be made until 20 days have elapsed for any payment made by check. Third party billing refunds will not be processed until the third party billing has been submitted for payment. The billing process will begin after the second week of each term.

Bookstore Refunds. The Linn State Technical College Bookstore textbook return policy requires students to keep sales receipts for full refunds. During the first week of purchase or prior to the semester start, the student may receive a 100% refund of purchase price only if the book is in original condition and with the sales receipt. During the second week of purchase the student may receive a 90% refund of purchase price for books in original condition and with a sales receipt. Sales paid for by check will be issued a check 20 days after original date of sale.

Refund Appeal. A student who believes he or she is entitled to a refund greater than the amount calculated by the above schedule may submit a written appeal to the Office of Administration & Finance. The reasons and circumstances believed by the student to justify a larger refund must be outlined in the written appeal. All requests for refunds must be submitted within two weeks of the class load change.

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 Linn State Technical College 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 FFEL Loans
 - ✓ Subsidized FFEL Loans
 - ✓ FFEL PLUS Loans
 - ✓ Federal Pell Grants
 - ✓ Federal Academic Competitiveness Grant
 - ✓ Federal SEOG
- b. A student's withdrawal date is:
 - i. The date the student initiated the institution's withdrawal process or officially notified the institution of intent to withdraw, or
 - ii. The student's last date of attendance at a documented, academically related activity (applicable only to specifically funded programs).
- c. How does the college determine the last date of attendance? 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.

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

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. For the Heavy Equipment Operations Program, clock hours scheduled to be completed are used to calculate the percentage of Title IV aid earned.

- a. The percentage of Title IV aid earned shall be calculated as follows: $\text{Number of days completed by student} \div \text{total number of days in the term (not counting breaks that include more than five days)} = \text{the percentage of aid earned.}$
- b. The percentage of Title IV aid unearned (i.e., to be returned to the appropriate programs) shall be 100% minus the percentage earned.
- c. Unearned aid shall be returned first by Linn State Technical College 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 Stafford Loan
 2. Subsidized Stafford Loan
 3. Parent Loans to Undergraduate Students (PLUS)
 4. Federal Pell Grant
 5. Federal Academic Competitiveness Grant
 6. Federal SEOG
 7. 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 Linn State Technical College from the student's account, the student is responsible for returning unearned aid to the appropriate program(s) as follows:

1. Unsubsidized Stafford Loan *
2. Subsidized Stafford Loan *
3. Parent Loans to Undergraduate Students (PLUS)
4. Federal Pell Grant **
5. Federal Academic Competitiveness Grant**
6. Federal SEOG **
7. 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: Linn State Technical College will return any grant money owed by the student.
The student will be responsible for reimbursing the college for any grant money returned.

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.

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

- a. Linn State Technical College'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.
 - ✓ 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, Linn State Technical College will assume the student has unofficially withdrawn. The midpoint of the semester may be used as the student's last date of attendance for the return of Title IV funds 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.

Linn State Technical College will notify the student of the amount of any federal grant overpayment. The student must repay the amount in full to Linn State Technical College. 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.

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 be a high school graduate or have a General Education Development (GED) certificate.

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

Students who are admitted as a None 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:

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

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.

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 900 clock hours. Students who maintain satisfactory academic progress remain eligible for financial aid.

Students who fail to meet one or more of the satisfactory academic progress requirements will be placed on financial aid probation for one semester. Students failing to meet the satisfactory academic progress requirements at the end of their probationary semester will be placed on financial aid suspension. Students who lose their financial aid eligibility may regain eligibility once they complete a minimum of 6 credit hours at Linn State Technical College 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 on financial aid suspension, they will return on financial aid probation.

Students cannot receive financial aid for more than 150% of the time frame of their degree. For example, in successfully completing a four semester (two-year) curriculum, the maximum time limit for student aid utilization as a full-time student is six semesters (three years). Students enrolled on less than a full-time basis will be allotted a proportionate amount of financial aid according to their enrollment status. Definitions for determining student status follow:

Full-Time Student:	12 credit hours per semester
Three-Quarters Time Student:	9-11 credit hours per semester
Half-Time Student:	6-8 credit hours per semester

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.

Students who attend Linn State Technical College 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 Linn State Technical College.

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.

FORMS OF AID

Linn State Technical College participates in the following programs:

- ◆ Federal Pell Grant
- ◆ Federal Academic Competitiveness Grant
- ◆ Federal Supplemental Education Opportunity Grant (SEOG)
- ◆ Federal College Work Study
- ◆ Federal Stafford Student Loan (subsidized and unsubsidized)
- ◆ Federal 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)
- ◆ Midwest Student Exchange Program (MSEP)

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. To apply, the Free Application for Federal Student Aid (FAFSA) Form must be filled out, showing the Linn State Technical College code (004711). Within four weeks students will receive from the Department of Education a Student Aid Report (SAR). Linn State Technical College will receive the same information electronically.

Federal Academic Competitiveness Grant (ACG). The Academic Competitiveness Grant is a federal assistance program for full-time students who are at degree-granting institutions, are U.S. citizens, are eligible for the Federal Pell Grant, and have completed a rigorous secondary school program of study. Students apply for this grant by completing the Free Application for Federal Student Aid (FAFSA) form. Other criteria may apply.

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 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 (1) a “subsidized interest” loan and (2) an “unsubsidized interest” loan. Effective July 1, 2007, the loan limits for a dependent first-year student is \$3,500. Limits increase to \$4,500 for second-year students. The maximum loan limit for students doing prerequisite work is \$2,625. Payback begins six months after leaving school with a fixed interest rate not to exceed 8.25 percent.

Independent students are eligible to borrow up to an additional \$4,000 in unsubsidized funds provided there is a need as determined by eligibility standards. Repayment can be delayed while attending school but a fixed interest rate not to exceed 8.25 percent starts to accrue at the time of loan disbursement unless the student chooses to have the interest capitalized until completion of the program. Dependent students are eligible to borrow the additional \$4,000 unsubsidized loan if a parent applies for a Federal Parent (PLUS) Loan but is denied due to credit

***Federal 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. The interest rate is a fixed rate that will not exceed nine (9) percent.

Private/Alternative Loan. This option will only be available if Linn State Technical College remains eligible per lender requirements. 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 based on the Prime rate plus a percentage based on 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 Director 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 April 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.

Missouri A+ Schools Program. Linn State Technical College 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 full cost of tuition and fees that are assessed to every full-time student. Housing, books, and program specific fees, such as professional licensing, 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).

Missouri Higher Education Academic Scholarship Program (Bright Flight, \$2,000 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.

Midwest Student Exchange Program (MSEP). Linn State Technical College participates in the Midwest Student Exchange Program. This program, established by the Midwestern Higher Education Commission to increase interstate educational opportunities for students in its member states, enables residents of Kansas, Michigan, Minnesota and Nebraska to enroll in designated Missouri institutions and programs at reduced tuition levels. Tuition for MSEP students attending Linn State Technical College is equal to 150 percent of resident tuition fees. For further information, please contact the Office of Admissions.

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

INTERNAL TUITION WAIVERS PROVIDED BY LINN STATE TECHNICAL COLLEGE

NOTE. 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 Linn State Technical College Scholarship Committee. It should also be noted that all internal awards are waivers of tuition. Should outside funding become available, it will take precedence over the college tuition waiver. Waivers may not exceed tuition in any semester and may be reduced at the discretion of Linn State Technical College. Awards are given to Linn State Technical College 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 and scholarships is available in the Office of Financial Aid and Office of Admissions.

President's Waiver. (\$2,000 Award) Awarded to first time entering college freshmen. Must rank in the top 15 percent of his/her high school class. Must have a composite score of 28 or higher on the enhanced ACT or have an ASSET/COMPASS test basic skills average score of the 97th percentile. 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.

SkillsUSA Waiver. (\$2,000, \$1,500, \$1,000 Award) Must place first, second or third at the state SkillsUSA contest. Students placing in more than one contest will receive the single highest award earned. This waiver is designed to reward students with strong technical skills. This tuition waiver is also available to Linn State Technical College students meeting the same contest criteria at the postsecondary SkillsUSA level. Must be used the first fall semester in which the recipient is eligible. Certificate must be presented to the Office of Financial Aid.

FFA Waiver. (\$2,000, \$1,500, \$1,000 Award) Awarded to first time entering college freshmen. 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 Linn State Technical College. This tuition waiver is also available to Linn State Technical College students meeting the same contest criteria at the postsecondary FFA level. Certificate must be presented to the Office of Financial Aid.

Academic Achievement Award. (\$1,000 Award) Awarded to first time entering college freshmen. Must have a composite score of 26 or higher on the enhanced ACT or have an ASSET/COMPASS test basic skills average score in the 94th percentile or higher. 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) Awarded to first time entering college freshmen. 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) Awarded to first time entering college freshmen. 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 Linn State Technical College. Certificate must be presented to the Office of Financial Aid.

Armed Service Award. (\$500 Award) Awarded to first time entering college freshmen. 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. Must submit a scholarship application and a letter of endorsement from the appropriate commanding officer. Tuition waiver is nonrenewable.

Phi-Beta Lambda (PBL) Waiver. (\$2,000, \$1,000 Award) 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. Certificate must be presented to the Office of Financial Aid.

Ford AAA Waiver. (\$2,000, 1,500, \$1,000 Award) Linn State Technical College 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 Linn State Technical College'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). Certificate must be presented to the Office of Financial Aid.

PAS (Postsecondary Agriculture Student) Waiver. (\$2,000, \$1,500 or \$1,000 Award) Awarded to Commercial Turf & Grounds Management students. This tuition waiver is awarded to first and second-year students who place first, second or third at the state PAS contest. Applications must be turned in within two weeks of competition. Award will apply to the current regular academic year. Certificate must be presented to the Office of Financial Aid.

National Hot Rod/Linn State Technical College Waiver. (\$1,000) Awarded to first time entering college freshmen. 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 Linn State Technical College and will be provided in the form of a tuition waiver. Certificate must be presented to the Office of Financial Aid.

Missouri Automobile Dealers Association (MADA) Waiver. (\$1,000, \$250 Award) Linn State Technical College is proud to recognize and reward the participants of the MADA Hands-On Competition. Individuals who place first will receive a tuition waiver for the amount of \$1,000. Individuals who place second, third, and fourth will receive a tuition waiver for the amount of \$250. Certificate must be presented to the Office of Financial Aid.

Non-Resident Tuition Waiver. (Maximum \$650 per Semester) Students who are not Missouri residents may be eligible to receive a non-resident tuition waiver provided they meet the following requirements: 1) Enroll in a program whose industry sponsors have service centers in the applicant's state of residence; and 2) Submit 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.

Mid-Missouri Consortium Tech Prep Student of the Year Tuition Waiver. (\$1,500 Maximum Award) This waiver is designed to reward students with strong technical skills. The waiver is awarded to first time entering college freshmen and must be used the first fall semester following the recipient's high school graduation. The recipient(s) and amount of this award are determined by the Tech Prep Department of Linn State Technical College.

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

Helping Hand Award (Alumni). (\$300 Award) This award provides an opportunity for a Linn State Technical College alumnus to extend a “helping hand” to another deserving person whom they encourage to attend Linn State. 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. Award is limited to one per student. This tuition waiver will be applied at the rate of \$300 for the fall semester only. Apply early, awards will be made on a first received basis. Application is available at www.linnstate.edu/alumni/pdf/helpinghand.pdf.

LINN STATE TECHNICAL COLLEGE SCHOLARSHIPS

Leadership Scholarship. (\$200 - \$500 Award) Scholarship grants of \$200 or more are given for leadership roles in organizations such as student government, yearbook, or newspaper. Students are nominated by a Student Government Association (SGA) sponsor.

Resident Assistants. Resident Assistants in Housing are able to get a fee reduction equal to the cost of double room rent. See the Resident Manager for a job description and application.

Girls State Scholarship. (\$1,200 Award) Applicant must be a Missouri Girls State Citizen (for the summer prior to enrollment) 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 Linn State Technical College. Certificate must be presented to the Office of Financial Aid.

Boys State Scholarship. (\$1,200 Award) Applicant must be a Missouri Boys State Citizen (for the summer prior to enrollment) 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 3.0 GPA is maintained and a minimum of 12 credit hours per semester is completed at Linn State Technical College. Certificate must be presented to the Office of Financial Aid.

CORPORATE, ENDOWED AND PRIVATELY SPONSORED SCHOLARSHIPS

The following scholarships are managed by the Foundation for Linn State Technical College and available to full-time students enrolling at Linn State Technical College for the Fall semester. Program specific scholarships list the eligible programs at the end of the scholarship description. Non-program specific scholarships are also indicated. **Summary of non-program specific scholarships** – *Central Electric Power Cooperative, Learfield Communications, Robert Marble, and Herbert Weeks*. Linn State Technical College is an equal opportunity organization and encourages applications from all individuals. Call (573) 897-5136 for more information or review complete scholarship guidelines at www.linnstate.edu/admissions/scholarships/default.asp. Scholarship deadline is February 15 unless otherwise noted.

3M Columbia Plant Scholarship (3 Awards @ \$1000 Each)

Awarded annually to first-time entering freshman students seeking Associate of Applied Science degrees in Electronics Engineering Technology, Industrial Electricity, Automation & Robotics Technology or Machine Tool Technology at Linn State Technical College. Students must be enrolled as a full-time student starting the fall semester of the year in which the scholarship is awarded. Selection is based upon demonstrated academic achievement, civic involvement, leadership, technical aptitude, career focus and financial need.

Eligible programs: Electronics Engineering Technology, Industrial Electricity, Automation & Robotics Technology and Machine Tool Technology.

Barr Engineering Scholarship (Up To \$4,000 Award)

Awarded each year to a full-time college student enrolled or planning to enroll at Linn State Technical College in pursuit of an Associate of Applied Science degree in Design Drafting Technology. Students who reside in the Mid-Missouri area will receive priority consideration.

Eligible program: Design Drafting Technology.

Beatrice Snyder Foundation Scholarship (Individual Scholarship May Be Any Sum Up To \$2,500)

Awarded annually to students accepted into the Automation & Robotics Technology degree program at the Advanced Technology Center in Mexico, MO. Any student accepted into the program and enrolled full-time may apply; however, candidates from Audrain County will receive priority consideration. Other restrictions apply. Applications are available through the Advanced Technology Center in Mexico. Deadline: July prior to fall enrollment.

Eligible program: Automation & Robotics Technology.

Caterpillar/Dean Machinery Company/Fabick CAT Scholarships (9 Awards @ \$2,000 Max. Each)

Awarded as a two-year scholarship to individuals interested in pursuing an Associate of Applied Science degree in the Heavy Equipment Technology, CAT Dealer Service Technician (HET Option) or Medium/Heavy Truck Technology programs at Linn State Technical College. Scholarships are awarded to students residing in Fabick CAT and Dean Machinery Company Dealer Service Regions.

Eligible programs: Heavy Equipment Technology, CAT Dealer Service Technician (HET Option) and Medium/Heavy Truck Technology.

Central Electric Power Cooperative Scholarship (\$1,000 Award)

Awarded each year to a first-time entering freshman student. Scholarship is nonrenewable. First consideration will be given to applicants in Central Electric's 26-county service area. Students who demonstrate financial need will also receive priority consideration.

All programs are encouraged to apply.

Construction Specifications Institute Scholarship (\$500 Award)

Awarded annually to a student pursuing an Associate of Applied Science degree in the construction related trades of Construction & Civil Technology, Design Drafting Technology, and Heating, Ventilation, & Air Conditioning Technology at Linn State Technical College. The recipient must be enrolled as a full-time student starting the fall semester of the year in which the scholarship is awarded. To be eligible, applicants must have a GPA of 2.500 on a 4.000 scale. Either currently enrolled Linn State Technical College students or high school graduating students can make application for scholarship. Individuals previously awarded scholarship may reapply, but priority is given to first-time applicants. Selection is based upon an individual's desire to achieve success through a career in a construction-related field. Applicants having a relationship or maintaining some form of association with a Construction Specification Institute member will be given priority consideration.

Eligible programs: Construction & Civil Technology, Design Drafting Technology, and Heating, Ventilation, & Air Conditioning Technology.

Laclede Electric Cooperative Scholarship (Up To \$13,000 Award)

Awarded as a two-year college scholarship to students pursuing an Associate of Applied Science degree in Electrical Distribution Systems. Applicants must be graduates or candidates for graduation of a high school or home school program within Laclede Electric Cooperative's service area. The scholarship is intended to be for two consecutive years at Linn State Technical College at a stipend of \$2,500 each semester for the first two semesters and \$4,000 each semester for the remaining two semesters. Deadline December 31.

Eligible program: Electrical Distribution Systems.

Learfield Communications Scholarship (Up To 2 Awards at \$500 Each)

Awarded annually to a first-time entering freshman student who is seeking an Associate of Applied Science degree at Linn State Technical College. The scholarship applies toward tuition and books.

All programs are encouraged to apply.

Linn State Technical College Electricity Club Scholarship (\$300 Award)

Awarded to a first-time entering freshman student enrolling at Linn State Technical College as a full-time student seeking a Certificate of Proficiency or Associate of Applied Science degree in Electrical Distribution Systems, Heating, Ventilation, & Air Conditioning Technology, or Industrial Electricity. Applicants will be evaluated on the basis of character, leadership and career focus. Preference will be given to those demonstrating financial need.

Eligible programs: Heating, Ventilation, & Air Conditioning Technology, Industrial Electricity and Electrical Distribution Systems.

Robert V. Marble Scholarship (\$750 Award)

Gertrude Marshall of Columbia, MO established this endowed scholarship in 1992. The fund supports award of an annual scholarship to youth with troubled backgrounds rehabilitated through the correctional system. Individuals released from the Boonville Correctional Center planning to pursue a Certificate of Proficiency or Associate of Applied Science degree at Linn State Technical College are eligible.
All programs are encouraged to apply.

Midcoast Aviation Scholarship (Up To 2 Awards @ \$1,500 Each)

Awarded each year to a first-time entering freshman student seeking an Associate of Applied Science degree at Linn State Technical College. Students must have a GPA of 2.500 on a 4.000 scale to be eligible for this general scholarship and must be enrolled as a full-time student within the academic year the scholarship is awarded. Selection will be based on demonstrated financial need and will be evaluated on the basis of character, leadership and career focus in a technical field. Past participation in student organizations as well as technical skills competition will be considered.

Eligible program: Aviation Maintenance.

Missouri Moonshiners' Street Rod Club Scholarship (Up To 2 Awards @ \$300 Each)

Awarded to students currently attending or planning to enroll at Linn State Technical College in pursuit of a Certificate of Proficiency or Associate of Applied Science degree in Automotive Collision Technology or Automotive Technology. Up to two scholarships may be awarded. Sponsored by the Missouri Moonshiners' Street Rod Club with the intent of providing financial assistance to those interested in a career in auto body repair or auto mechanics.

Eligible programs: Automotive Collision Technology and Automotive Technology.

Missouri Telecommunications Industry Association (MTIA) Scholarship (Up To 2 Awards @ \$1,000 Each)

Awarded each year to a first-time entering freshman student who is pursuing the Associate of Applied Science degree in Networking Systems Technology – Telecommunications Option at Linn State Technical College. Students who demonstrate financial need will receive priority consideration. The scholarship is sponsored by the Missouri Telecommunications Industry Association with the intent of providing financial assistance to those interested in the telecommunications industry. Deadline: August 31.

Eligible program: Networking Systems Technology – Telecommunications Option.

National Association Of Women In Construction (NAWIC), Central Missouri Chapter #341 Scholarship (2 Awards @ \$500 Each)

Two annual scholarships awarded each year to full-time students, both men and women, attending Linn State Technical College who are pursuing a Certificate of Proficiency or Associate of Applied Science degree in the construction related trades of Construction & Civil Technology, Design Drafting Technology, Heating, Ventilation, & Air Conditioning Technology, and Heavy Equipment Operations. Recipients will be chosen based on their interest in entering a construction-related trade upon completion of their course work at Linn State Technical College. Priority of selection is based upon an individual's general aptitude and personal traits that are viewed conducive to success in the construction field. Recipients must be enrolled full-time starting the fall semester of the year in which the scholarship is awarded in order to remain eligible.

Eligible programs: Construction & Civil Technology, Design Drafting Technology, Heavy Equipment Operations, and Heating, Ventilation, & Air Conditioning Technology.

Neal Harris Heating, Air Conditioning And Plumbing Scholarship (Up To \$5,625 Award)

Awarded to an individual interested in pursuing an Associate of Applied Science degree in Heating, Ventilation, & Air Conditioning Technology at Linn State Technical College. Scholarship funds (\$250 of which is a tuition waiver from LSTC) are dispersed to the student's account on a per semester basis in the amount of \$1,250 for semesters in which the student remains eligible. Recipient must agree to serve a summer internship with Neal-Harris Heating, Air Conditioning and Plumbing, in Kansas City. The recipient must also contractually agree to work at Neal Harris for two years following completion of the two-year degree. Should outside funding become available, it will take precedence over tuition waiver.

Eligible program: Heating, Ventilation, & Air Conditioning Technology.

Nuclear Suppliers Association (Up To 2 Awards @ \$1,000 Award)

Awarded to students beginning their second year in the Nuclear Technology Program. To be eligible, applicants must have a GPA of 3.000 on a 4.000 scale during the first two semesters enrolled. Selection is based on financial need, academic achievement and leadership. Deadline: July 15.

Eligible program: Nuclear Technology.

Pemiscot-Dunklin Electric Cooperative Scholarship (\$4,400 Award)

Awarded as a two-year college scholarship to students pursuing an Associate of Applied Science degree in Electrical Distribution Systems at Linn State Technical College. To be eligible, individuals must continuously reside from the beginning of high school senior year through application deadline in a home served by Pemiscot-Dunklin Electric Cooperative. Applicants must interview with Pemiscot-Dunklin Electric Cooperative. The recipient will serve a summer internship with Pemiscot-Dunklin Electric Cooperative and agree to four years of contracted employment following completion of the two-year degree.

Eligible program: Electrical Distribution Systems.

Terry Rakes Memorial Scholarship Sponsored By Square D Company (\$1,000 Award)

The scholarship is awarded each year to a deserving second-year Machine Tool Technology student at Linn State Technical College who most exemplifies the individual qualities and high degree of craftsmanship exhibited by Mr. Rakes in the tool and die trade. The scholarship applies toward the costs associated with a student's education including, but not limited to, incidental fees (tuition), books, lab fees, tools, housing, etc. Eligibility is determined by the individual's intent to pursue a career as a tool and die maker.

Eligible program: Machine Tool Technology.

Roeslein & Associates, Inc. Scholarship (Up To \$4,500 Award)

Awarded each year to a full-time college student enrolled or planning to enroll at Linn State Technical College in pursuit of an Associate of Applied Science degree in Design Drafting Technology or Industrial Electricity. Students who reside in the St. Louis area will receive priority consideration. The scholarship provides \$2,250 during the first year. Upon maintaining eligibility, students may qualify for an additional \$2,250 during the second year of the program.

Eligible programs: Design Drafting Technology and Industrial Electricity.

Route 66 Car Club Scholarship (Up To \$1,000 Award)

Awarded each year to a first-time entering college freshman planning to enroll at Linn State Technical College in pursuit of a Certificate of Proficiency or Associate of Applied Science degree in Automotive Collision Technology or Automotive Technology. The scholarship provides a total of \$1,000 divided between two semesters upon maintaining eligibility.

Eligible programs: Automotive Collision Technology and Automotive Technology.

St. Louis Aviation Maintenance Association Scholarship (\$1000 Award)

Awarded to a student pursuing an Associate of Applied Science degree in Aviation Maintenance. To be eligible, the student must be enrolled full-time during the academic year of scholarship selection. Selection is based on the recipient demonstrating appropriate levels of academic preparation, character, and career interest. Financial need will also be considered.

Eligible program: Aviation Maintenance.

Herbert Weeks Scholarship (\$500 Award)

Awarded each year to a Linn High School graduate who wishes to attend Linn State Technical College. Students who demonstrate financial need will receive priority consideration. The scholarship may be awarded to first-year or second-year students; however, the award is not automatically renewable.

All programs are encouraged to apply, must be a graduate from Linn R-II High School.

West Central Electric Cooperative Scholarship (Up To 4,800 Award)

The scholarship is awarded every other year to a student interested in pursuing an Associate of Applied Science degree in Electrical Distribution Systems. Applicant must be a graduate of a high school within the West Central Electric Cooperative service area within the same year of application. Applicants must have a GPA of 2.500 on a 4.000 scale to be eligible and must be enrolled as a full-time student.

Eligible program: Electrical Distribution Systems.

Yeager's Cycle Sales Scholarship (\$2,000 Award)

Awarded each year to a student pursuing an Associate of Applied Science degree in Powersports Technology. Students must have a GPA of 2.500 on a 4.000 scale to be eligible and must be enrolled as a full-time student within the academic year the scholarship is awarded. The recipient will intern at Yeager's Cycle Sales during the two-year program and contractually agree to four years of contracted employment following completion of the two-year degree.

Eligible program: Powersports Technology.

EXTERNALLY MANAGED SCHOLARSHIPS

Externally managed scholarships specific to Linn State Technical College students. Must obtain information from the scholarship sponsor or visit the website:

Black River Electric Cooperative (\$9,900 Award)

Eligible program: Electrical Distribution Systems.

Ozark Electric Cooperative (\$4,400 Award)

Eligible program: Electrical Distribution Systems.

Three Rivers Electric Cooperative (\$1,000 Award)

All programs are encouraged to apply, must live within the Three Rivers Electric Cooperative service area.

Earnest & Lillian Swanson Scholarship (Federated Garden Clubs Of Missouri, Inc.) (\$500 - \$3,000 Award)

Eligible program: Commercial Turf & Grounds Management.

Scholarship applications available in the Office of Financial Aid and Office of Admissions at Linn State Technical College.

GOVERNMENT FINANCIAL AID PROGRAMS

Workforce Investment Act (WIA). This program provides funding to meet college expenses. Eligibility is determined on an individual basis and reflects current economic circumstances of the applicant. Persons who have been terminated or laid-off should contact the nearest employment office to apply.

GAMM Vocational Training Program. Residents of Northeast Missouri including the counties of Knox, Scotland, Clark, Lewis, Macon, Shelby and Adair may be eligible for tuition assistance of up to \$3,000 per school year. Eligibility is determined individually and recognizes the unique problems in the farming community. Further information may be acquired by contacting the GAMM office at La Belle (816-462-3221).

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 Job Service Office.

Vocational Rehabilitation Services. The Vocational Resource Educator at Linn State Technical College administers vocational rehabilitation (VR) services designed to help citizens with physical or mental disabilities obtain suitable employment. 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 (800) 877-8963 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.

ACADEMIC/INSTITUTIONAL REGULATIONS

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, which is given out during the first class meeting. Departments and/or instructors may have strict attendance requirements. Departments may also require written contracts.

If the student is absent excessively, he/she must either withdraw from the class or accept the final grade given by the instructor. Failure to officially withdraw from a class(es) may result in an "F" 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.)

A student who will not be attending a class is expected to leave a message with the college receptionist by calling 1-800-743-8324. The receptionist will then relay the message to the appropriate instructors and staff.

Only instructors may determine what is or is not allowed for make up work. It is the responsibility of the student to arrange to immediately make up work missed because of class absence. In cases of prolonged absence, the student must notify the Dean of Students, who will then notify the student's instructors. See the Student Handbook at www.linnstate.edu/current/pdfs/StudentHandbook.pdf for further details on attendance.

CLASS LOAD

Students desiring to take more than 18 credit hours or less than 12 credit hours per semester must meet with their advisor for approval. Students desiring to take less than a full class load of 12 credit hours per semester also need to consult the Office of Financial Aid about their financial aid eligibility.

INCLEMENT WEATHER

During severe weather, Linn State Technical College will hold classes beginning at the usual time unless announced otherwise in the public media or on the website at www.linnstate.edu. The announcement will specifically state Linn State Technical College. (Announcements regarding Linn R-II, the local high school, do not pertain to Linn State Technical College.) When it is determined and announced that class starting time should be delayed due to inclement weather, classes will meet according to the "Snow Schedule". If Linn State Technical College is on "Snow Schedule", classes will begin at 10:00 a.m. Those that meet prior to 10:00 a.m. will be cancelled. Report to 10:00 a.m. classes or the class that would normally be in session at 10:00 a.m. This will allow students and staff the opportunity to begin classes after the roads have been cleared and the campus prepared. It is necessary that faculty and other personnel arrive as soon as possible to carry on the necessary functions of the college and be available for students as they arrive. In all cases, use judgment regarding hazardous driving conditions. Every attempt will be made to make inclement weather decisions and notify the media prior to 6:00 a.m.

ASSESSMENT POLICY

Linn State Technical College is committed to improving student learning 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 institutional assessment at appropriate points of development in their programs of study.

Designed to ensure continuous improvement, LSTC's assessment process includes placement exams, nationally standardized certification and licensure exams, projects and performance assessments, capstone courses, student needs and satisfaction surveys. Linn State Technical College will provide an ongoing evaluation of the assessment and placement process. Such an evaluation occurs on a regular basis and is monitored by the Assessment Committee.

GRADUATION REQUIREMENTS

In addition to meeting the Associate of Applied Science degree or certificate requirements listed in this catalog, all candidates for graduation are required to:

- ◆ Complete internships and practicum hours as appropriate.
 - ◆ 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 and sign an application for graduation (and a petition to participate if applicable) before the deadlines specified by the Academic Records Office.*
 - ◆ Complete all required assessments and surveys.
 - ◆ Clear all financial obligations to the college.
 - ◆ Complete a Financial Aid Exit Interview.
 - ◆ Complete the Career Services Seminar or the Job Search Strategies class.
- * May graduates should apply by the preceding October 1.
* August graduates should apply by the preceding March 1.
* December graduates should apply by the preceding July 1.

A student who does not meet the specified requirements will be ineligible for graduation and must reapply for graduation in the semester that all requirements are met.

To participate in commencement ceremonies, a student must meet all graduation requirements, obtain a cap and gown from the Activities Coordinator, and wear proper attire with his or her cap and gown during the ceremony.

OFFICIAL TRANSCRIPT REQUEST

To request an official Linn State Technical College transcript, submit a Transcript Release form to the Academic Records Office. Transcript Release forms are available in the Academic Records Office and on the Linn State Technical College website at www.linnstate.edu/alumni. There is no charge for requesting transcripts.

GRADING SYSTEM

Many factors determine a grade for a given class. Preparation of all daily assignments, test scores, class participation, and attendance are some factors in addition to knowledge, understanding and application of the material. A grade represents an evaluation of a student's academic performance in a class and is determined by criteria established by the faculty and communicated to students in the class syllabus. The Linn State Technical College grading system is as follows:

Grade	Explanation	Quality Points Per Credit Hour
A	Superior	4
AR	Articulated Credit	N/A
AU	Audit	N/A
B	Above Average	3
C	Average	2
CR	Credit	N/A
D	Below Average, Passing	1
F	Fail	0
I	Incomplete	N/A
NR	No Grade Recorded	N/A
P	Pass	N/A
TR	Transfer Credit	N/A
WD	Withdrew	N/A

The following grading scale is used for all Linn State Technical College graded credit classes:

Grading Scale	A	B	C	D	F
	90 to 100%	80 to 89.9%	70 to 79.9%	60 to 69.9%	59.9% and below

Higher grading percentages than the above grading scale will take precedence with approval by the Dean of Instruction if the need is supported by program accreditation or certification requirements.

JOB READINESS AND ATTENDANCE DOCUMENTED ON TRANSCRIPTS

Beginning the fall semester 2009, students will have a Job Readiness Score and Attendance Percentage posted on their permanent transcript for each class in addition to their Academic Grade. The Job Readiness Score will be calculated based on areas related primarily to attitude and work ethic. Academic grades only will be used in calculating grade point average. This value added service to students is the result of work that has been done with advisory committee members representing employers of Linn State Technical College graduates.

GRADE REPORTS

Within two weeks of the end of the semester, grade reports are mailed to students with clear college accounts. Grade reports are mailed to the address the student has designated and cannot be mailed to more than one location. Students with holds on their accounts may view their grades in the Academic Records Office and pick up their grades once the holds are resolved and their college accounts are cleared.

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 Cashier and Financial Aid staff.

A completed Special Student Schedule form must be submitted to the Academic Records Office to officially withdraw from a class.

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

WITHDRAWING FROM THE COLLEGE

To officially withdraw from Linn State Technical College, 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 determined by the Office of Financial Aid. Upon any consideration of withdrawal, the student is strongly encouraged to speak with the Financial Aid staff. All students who receive any type of financial aid or veterans benefits must notify the Office of Financial Aid before withdrawing from the college to avoid incurring additional debt.

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.

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.

TRANSFER CREDITS

Students who have earned a passing grade of "C" or better from another institution of higher education in classes comparable to those offered at Linn State Technical College may be granted advanced standing based on an evaluation of their transcript. 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 Linn State Technical College 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.

Students requesting transfer credit from an institution of higher education outside the United States must have their 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 Linn State Technical College grade point average calculation. However, Linn State Technical College students at the Advanced Technology Center taking general education courses from Moberly Area Community College will have their course grades transcribed in the same manner as a Linn State Technical College course. Grades from those courses are calculated in the students' grade point average.

RESIDENCY REQUIREMENT

To graduate from Linn State Technical College with an A.A.S. degree, a student is required to have earned a minimum of 32 credit hours in technical education from Linn State Technical College. The 32 credit hours in technical education must meet the requirements of the degree being sought. The 32 credit hours in technical education may include approved articulated credit with Linn State Technical College.

DUAL ENROLLMENT COURSES

Dual enrollment allows qualified high school juniors and seniors to earn college credit for taking designated college-level classes under specific conditions. Dual enrollment classes may be offered at area high schools, career centers or on a Linn State Technical College campus.

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

- ◆ Achieve a cumulative high school grade point average of 2.000 or higher on a 4.000 scale.
- ◆ Complete and submit a Linn State Technical College application for admission.
- ◆ Submit a current high school transcript.
- ◆ Complete and submit a Dual Enrollment Permission Form signed by:
 1. A high school superintendent, or principal, or counselor, or career center director
 2. and, a parent or legal guardian.
- ◆ 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.

DUAL CREDIT COURSES

Linn State Technical College will grant appropriate college credit for classes taken while enrolled in high school under a Dual Credit Program. For a student to receive Linn State Technical College credit, the Office of Admissions must receive an official college transcript mailed from the college or university granting the credit. Required course equivalency will be evaluated on a case by case basis.

ARTICULATION OF SECONDARY/TECHNICAL COURSES

Various area secondary/technical schools and comprehensive high schools within the state have entered into articulation agreements with Linn State Technical College. The primary goal of articulation is to expand educational opportunities for students with a seamless transition from secondary to higher education technical

programs at Linn State Technical College. Articulated credit for secondary technical classes will be applied only to Linn State Technical College Associate of Applied Science degrees. Students who want to apply articulated credit must be degree seeking. Articulated credit is not applicable to one-year certificate programs. Articulation credit must be used within the first year after high school graduation.

In the event of articulation credit, it is the student's responsibility to make sure he/she does not enroll in Linn State Technical College classes that duplicate the articulated credit under review. If the student is enrolled in a class that might articulate and the cut off 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 will not be figured into the student's grade point average.

LINN STATE TECHNICAL COLLEGE COURSE EQUIVALENCY EXAMINATIONS

When a student believes he/she already possesses the knowledge and skills to be gained from enrolling in a class, the student may request to take an equivalency exam to demonstrate proficiency in the course content and test out of the class. The student must first apply for approval to take an equivalency exam by completing the Request for Equivalency Exam form and submitting it to the Registrar prior to the sixth day of the semester. If the Request for Equivalency Exam is approved by the appropriate department chair, payment (tuition only) for the class is required prior to taking the equivalency exam. Equivalency exams may include written, hands-on demonstration, and/or oral tests to determine student proficiency in course content. When the student successfully passes the equivalency exam, the Registrar awards credit for the course. When a student does not successfully pass the equivalency exam, he/she then enrolls in the class, pays the full price (tuition and fees) of the class, and completes the class.

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 and the Registrar. 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. Students who audit a class are expected to complete all class requirements. Students who register on an audit basis will pay the regular tuition rate and must meet the class prerequisites or receive special permission from the instructor. Students 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.

LATE ENROLLMENT AND ADDITIONAL CLASSES

Students are 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.

CLASS RE-TAKE POLICY

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.

GRADE CHANGES

A student has until six weeks after the end of the semester during which a class is completed to petition for the final grade in that class to be changed. To appeal a final class grade, follow the student complaint and grievance procedure in the Student Handbook, which is located at www.linnstate.edu/current/pdfs/StudentHandbook.pdf.

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 earned. The grade symbols of P, WD, I, AR, AU, CR, NR and TR are not included in calculations of grade point average.

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

ACADEMIC HONORS

Full-time students (students enrolled in 12 or more credit hours) who earn a semester grade point average (GPA) of 3.500 or higher will be placed on that semester’s Dean’s List. Students whose semester grade point average is 3.000 to 3.499 will be placed on that semester’s Honor Roll. Students with high academic grades are eligible for membership in the Phi Theta Kappa, Alpha Phi Omicron Chapter at Linn State Technical College, a national scholastic honor society.

ACADEMIC STANDARDS

All students are expected to maintain a 2.000 or better cumulative grade point average (GPA) for graduation. A cumulative GPA of 2.000 is also required in the core curriculum and program requirements. Program standards that exceed this requirement will take precedence.

ACADEMIC HONESTY

Academic dishonesty is an offense against the college. A student who has committed an act of academic dishonesty has failed to meet a basic requirement of satisfactory academic performance. Thus, academic dishonesty is not only a basis for disciplinary action but is also relevant to the evaluation of the student’s level of performance. Academic honesty requires that students do not cheat or knowingly assist another to do so. Other unacceptable behavior includes plagiarism, which is the submitting of someone else’s work as one’s own, unauthorized access to examinations, and changing of grades. LSTC faculty consider the submitting/performing of essentially the same single piece of work for credit in different classes to be dishonest unless all faculty members involved have pre-approved in writing that the specific piece of work is eligible for credit in multiple classes.

ACADEMIC PROBATION

Students receiving an overall semester GPA of below 2.000 shall 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 are substandard and continued substandard grades in the next semester will result in academic suspension. Academic probation does not prohibit a student from enrolling in the next semester’s classes.

ACADEMIC SUSPENSION

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

STANDARD OF STUDENT CONDUCT

Students enrolling at the college assume the obligation to conduct themselves in a manner compatible with the policies of the college. If a student fails to do so and engages in behavior disruptive to the educational process, the college will institute appropriate disciplinary action.

Specifically, students are expected to comply with federal, state, and county laws concerning activities prohibited generally and specifically on college property and at college-sponsored functions. Among these illicit activities are civil disobedience, forgery, cheating, gambling, immoral conduct, libel, theft, use and sale of alcoholic beverages and narcotics.

In addition to demonstrating honesty and integrity, students are expected to comply with all policies, regulations and procedures of Linn State Technical College.

DISCIPLINARY PROBATION

A student may be placed on disciplinary probation for unsatisfactory conduct or excessive absenteeism. Unsatisfactory conduct can include cheating and not meeting the standard of student conduct. The Dean of Students or Counseling Services Staff will determine the imposition of disciplinary probation, its duration and conditions for removal from that status. Failure to comply with disciplinary probation will lead to disciplinary suspension.

DISCIPLINARY SUSPENSION

A student may be placed on disciplinary suspension for behaviors that violate the rules of the college; local, county, state or federal laws; or which bring ill repute to the college. Violations relating to insubordination, harassment, drugs/alcohol, vandalism, threats, unsafe acts and uncivil behaviors may lead to direct suspensions without prior disciplinary probation having to be imposed. Duration of suspension varies at the discretion of the Dean of Students.

COMMUNITY SERVICE HOURS

The Dean of Students may assign community service hours as an additional sanction for disciplinary violations. The hours assigned usually vary from 10 hours to 50 hours with time limits for completion from one week to one semester. If not completed in the time designated, community service hours convert to fines of \$10.00 per hour up to a maximum of \$500.00.

DISMISSAL FROM COLLEGE

A student may be dismissed from Linn State Technical College for one or both of the following reasons:

1. Unsatisfactory academic progress as outlined in the Academic Standards section of this catalog. (See Student Handbook at www.linnstate.edu/current/pdfs/StudentHandbook.pdf for details.)
2. Inappropriate student conduct, which includes a lack of required attendance, as outlined in the Disciplinary Probation section of this catalog. (See Student Handbook at www.linnstate.edu/current/pdfs/StudentHandbook.pdf for details.)

SUBSTANCE ABUSE

Policy. Linn State Technical College strives to maintain a working and learning environment that is free from the effects of alcohol and illegal drugs.

The unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited while in a college vehicle, in the classroom, on the job while completing a program internship, as an employee of the college, on Linn State Technical College property (whether owned, leased and/or operated by the college) or at school sponsored activities. The term “controlled substance” refers to any illegal substance, to the illegal use of alcohol, and/or to the illegal use of controlled prescription pharmaceutical products.

Linn State Technical College forbids the possession of any alcoholic beverage on campus, on any property or in a vehicle owned, leased and/or operated by the college, in compliance with the Missouri State law that forbids the presence of alcohol on or in public school facilities and property. The Board of Regents’ approved policies are filed in the President’s Office.

Substance Abuse Violation Notice. As a condition for admission to LSTC and continued enrollment every student shall:

- a. Abide by the terms of this substance abuse policy.
- b. Abide by the terms of all applicable state and federal regulations pertaining to drugs and alcohol while in a college vehicle, in the classroom, on the job while completing a program internship, as an employee of the college, on LSTC property (whether owned, leased and/or operated by the college) or at school sponsored activities.
- c. Sign a statement, as follows: “I certify that, as a condition for admission to Linn State Technical College, I will not engage in unlawful manufacture, distribution, dispensation, possession, or use of any controlled substance during the period of my enrollment at the college.”

Penalties for Substance Abuse Violations. Violations of the LSTC substance abuse policy will result in appropriate disciplinary action (consistent with local, state, and federal law) according to established procedures. Permanent suspension from school attendance, termination of employment, and/or referral for prosecution may be the consequence of infractions of this policy. Loss of eligibility for financial aid may also result.

Violations of the many state and federal laws governing controlled substances carry varying penalties. Under Missouri law, punishment for possession of controlled substances can range up to 15 years imprisonment, depending on the quantity and type of controlled substance. Punishment for manufacture or distribution of controlled substances can range up to 30 years or life imprisonment, depending on the quantity and type of controlled substance. These statutory ranges of punishment are increased for prior or persistent offenders. Punishment for violations of federal drug laws is set by the Federal Sentencing Guidelines, which establish ranges of punishment after consideration of a variety of sentencing factors. The Board of Regents’ approved policies are filed in the President’s Office.

Counseling. Students who need assistance in locating professional services such as drug counseling and/or rehabilitation programs may request information from the Counseling Services Staff of the college. Such contacts will be handled with confidentiality. However, volunteering to participate in treatment programs will not, of itself, prevent disciplinary action for violation of the substance abuse policy. Counseling Services Staff will assist with referrals upon request. (Information about additional private counseling resources may also be accessed through the Office of Counseling Services).

Tobacco Free Campus. Smoking and use of smokeless tobacco is not permitted inside any building or vehicle owned, leased, and/or operated by the college.

PRESIDENTIAL ORDER ON FIREARMS

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

GRIEVANCE POLICY

Linn State Technical College personnel shall maintain records of formal written student complaints, which will be filed with the Dean of Students. 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 are available from the Office of Counseling Services. See the Student Handbook at www.linnstate.edu/current/pdfs/StudentHandbook.pdf for details on making complaints or filing grievances.

NON-DISCRIMINATION PROCEDURE

It is the practice of the Linn State Technical College Office of Counseling Services to supply every entering student with the Notice of Non-Discrimination and their rights under Title VI (1964), Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. Each student is given written notice that the Student Handbook is located at www.linnstate.edu/current/pdfs/StudentHandbook.pdf and encouraged to print a copy. This information is also available in the Dean of Students' Office. Copies of signatures from students which indicate receipt of these notifications are on file in the Academic Records Office.

SEXUAL HARASSMENT

It is the policy of Linn State Technical College that no employee or student be harassed by an employee, supervisor, student, or instructor on the basis of gender and that no personnel or academic action be taken affecting an employee or student (either favorably or unfavorably) on the basis of conduct that is not related to work or classroom performance. Such conduct may include sexual advances or raising a complaint concerning the alleged violation of this policy. For additional information, students should refer to the Student Handbook at www.linnstate.edu/current/pdfs/StudentHandbook.pdf. The Board of Regents' approved policies are filed in the President's Office.

ACADEMIC RECORDS

Linn State Technical College 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 Linn State Technical College Student Handbook. Additional information can be obtained from the Registrar at (573) 897-5154 or on the Linn State Technical College website at www.linnstate.edu/current/pdfs/StudentHandbook.pdf.

CAMPUS CRIME PREVENTION AND AWARENESS

In compliance with the Campus Security Act of 1990 and the Amendment of 1992 (Public Law 101-542), Linn State Technical College publishes and distributes statistics that list the number of criminal offenses and arrests reported on each of its campuses for the past three years. These statistics and the policies and procedures for preventing and reporting crimes are provided in the Student Handbook, which is prepared bi-annually. The Student Handbook is available on the Linn State Technical College website at www.linnstate.edu/current/pdfs/StudentHandbook.pdf. The Board of Regents' approved policies are filed in the President's Office.

STUDENT LIFE, ACTIVITIES AND SERVICES

Services for students at Linn State Technical College are designed to provide support services to students in meeting their individual educational goals. Services to students at LSTC include career planning, academic advisement, housing assistance, financial aid, library resources, academic support, and services for special populations.

The Office of Counseling Services works together with all faculty members in carrying out the counseling program at Linn State Technical College. Academic, social, and vocational concerns will be primarily coordinated in the Office of Counseling Services. The counselors do not attempt to make decisions for students; rather, they seek to help students make responsible decisions for themselves. Counseling services at LSTC assist students in making educational and personal decisions. If additional counseling services are required, the college staff will refer the students to qualified counselors off-campus.

SERVICES FOR SPECIAL POPULATIONS

The college 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. Linn State Technical College does not discriminate on the basis of race, color, national origin, sex, age or handicap in admission/access to or treatment/employment in its programs and activities. Any persons having inquiries concerning LSTC compliance with such regulations should contact the Dean of Students by phone at (573) 897-5193 or by mail at Linn State Technical College, One Technology Drive, Linn, MO 65051.

Students requesting accommodations should contact the Vocational Resource Educator (VRE). The type of service made available is dependent upon documented expressed need. The accommodations for students with special needs are coordinated through the Vocational Resource Educator (VRE). If a student has a documented disability or impairment that prevents him/her from completing tests or other assignments in class; the student may request an Individualized Education Plan (IEP) or 504 Plan with accommodations which will allow for tests or assignments to be completed in the Academic Resource Center, with prior arrangements made by the instructor. If a student finds that his/her academic program is not accessible, information should be reported to the VRE or Department Chair. As needs are reported, every effort is made to respond in a timely manner to make programs accessible.

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, faculty, staff, and community patrons. The Library provides print materials, AV materials, and a multitude of online databases. Students will find resources that cover highly technical and specialized topics as well as fiction, nonfiction and recreational literature. The Library also provides Internet access in the Online 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.

Linn State Technical College is a charter member of the Missouri Bibliographic Information User System, known as MOBIUS. It is a statewide consortium that provides access to resources of all private and public academic libraries in Missouri. MOBIUS (<http://mobius.missouri.edu>) and OCLC (Online Computer Library Center) Interlibrary Loan services extend access and delivery beyond the walls of the Linn State Technical College campus, thus allowing our students access to nearly unlimited resources.

Professional librarians are available in the library and can be reached by email (librarian@linnstate.edu) or by telephone (573) 897-5215 for reference and research assistance. Additional information can be found at www.linnstate.edu/library and the online access catalog at <http://lance.missouri.edu>.

ACADEMIC RESOURCE CENTER

The mission of the Academic Resource Center is to provide academic support and resources which enhance instructional programs. The Academic Resource Center is composed of a Math/Science Center, a Writing Center, and the Learning Center. Services of the Math/Science Center include individual and group tutoring for mathematics and science, exam reviews, and computerized tutorials. Students may come to the Writing Center for individual assistance with any Linn State Technical College writing assignment and resume preparation. Services also include computerized tutorials in reading, writing, and language arts. The Learning Center includes individual and group study areas and computers equipped with current Microsoft software. The Academic Skills Lab is housed in the Academic Resource Center and has computers available for group instruction. The Academic Resource Center supports students with developmental math, writing, and reading needs. In addition, accommodations for students with Individualized Education Plans (IEP) are also supported.

COMPUTER AND INTERNET ACCEPTABLE USE POLICY

Computer and Internet use are governed by LSTC Board of Regents' policy. This policy provides for general ethical behavior and acceptable use of LSTC computers and Internet access. Administrative procedures have been developed to assure that all students understand and adhere to board policy. Therefore, 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.

See the Student Handbook for the "Computer and Internet Acceptable Use Procedure".

ON-CAMPUS HOUSING FACILITIES

The first residential cottages for Linn State Technical College opened in the Fall of 2000. The Linn State Technical College 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 have access to a variety of meal plan options provided by the Linn State Technical College cafeteria. Residents must 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 the Student Handbook found on the Linn State Technical College website at www.linnstate.edu/current/pdfs/StudentHandbook.pdf.

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 Linn State Technical College graduates to enter and hold related employment is one of the most important indicators of the college's success. Linn State Technical College's "lifelong" career services assistance program was developed to assist graduates in obtaining employment in related occupations. For details regarding these services, see the Student Handbook on Linn State Technical College website at www.linnstate.edu/current/pdfs/StudentHandbook.pdf. 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 Activities Coordinator assists faculty and Student Government Association officers in maintaining an effective program of student activities. The college offers a number of activities which 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, movie nights, dances, softball, volleyball, bowling, cultural programs, ski trips, pool parties, etc. The Activities Coordinator always welcomes suggestions for new activities.

Organizations that are currently in existence are Student Government Association (SGA), VIP/Student Ambassador Program, Phi Theta Kappa (PTK), College Yearbook Club, SkillsUSA, Horticulture/PAS Club, Electricity Club, Aviation Club, Drafting Club, Computer Club, TECH Team (Automotive Technology), Residential Government Association (RGA), Interfaith Group, Electronics Technicians Association (ETA), Associated General Contractors (AGC), Photography Club, Diesel Technology Club, Physical Therapist Assistant Club, and American Public Works Association (AWPA). 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 Activities Coordinator. Any interested person or group of people who wish to create an organization can form clubs on campus. All student clubs must have a Linn State Technical College-affiliated sponsor in order to draw upon student activity fees and use Linn State Technical College in their names. See the Activities Coordinator for details.

STUDENT SERVICE SEMESTER

Linn State Technical College is concerned with providing students not only the skills but also the attitudes required to be employable and promotable. An understanding of work ethics is central to success in the business and industrial environment. Employment managers and personnel representatives seek job applicants with a demonstrated history of strong work ethic performance. To demonstrate a favorable attitude, students may elect, on a volunteer basis, to work for the school or the community. This project, which is referred to as a Student Service Semester, may be undertaken during any semester. The project must require at least 10 hours to complete. Those students who would like a Dean's Citation may contract for a minimum of 15 hours. Those aspiring to earn a Presidential Citation should complete a minimum of 20 hours. Students should see the Dean of Students, the Counseling Services Staff or their Academic Advisor for ideas on how to be of service to Linn State Technical College and/or to the City of Linn or their own community. Volunteer hours should be logged through the Activities Coordinator.

TRAFFIC

All vehicles must be registered with the college. The speed limit on the campus is 15 mph. Exercise extreme caution. If speed limits are abused, driving privileges on campus may be revoked and a fine may be issued. Pedestrians have the right-of-way when crossing the campus drive. All drivers should stop to let pedestrians cross the road.

PARKING

Student parking is restricted to the student parking lots. Parking permits for students can be obtained from the receptionist. Additional or replacement permits are available at the cost of \$25.00 per permit. Any vehicle parked in unauthorized areas or without displayed parking permits will be subject to the following:

1. Minimum \$25.00 fine for parking violation.
2. Repeat offenders will be subject to the towing of the vehicle at the owner's expense.
3. Double fines may be assessed for failure to heed warnings.

Special arrangements for handicapped and temporary parking can be made with the Receptionist. Payment for parking tickets is made at the Cashier's Office. Parking fines will be posted to the student's account.

STUDENT HANDBOOK

The Office of Counseling Services electronically publishes a Student Handbook bi-annually on the Linn State Technical College website, www.linnstate.edu. The handbook describes in detail student services guidelines and procedures, college regulations, student conduct policies, and the student discipline process. The current student handbook is located on the Linn State Technical College website at www.linnstate.edu/current/pdfs/StudentHandbook.pdf. It is the responsibility of every student to read this document and follow the guidelines and procedures detailed within the handbook. Students are encouraged to print a copy of the handbook from the website for their own use.

DEGREE REQUIREMENTS

COURSE PREFIXES

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

ACC	Accounting	HVT	Heating, Ventilation, & Air Conditioning Technology
ACT	Automotive Collision Technology	IEL	Industrial Electricity
AMT	Automotive Technology	MAR	Automation & Robotics Technology
ASC	Associated Science Course	MAT	Mathematics
BUS	Business	MHT	Medium/Heavy Truck Technology
CAT	CAT Dealer Service Technician (HET Option)	MNT	Nuclear Technology
CCT	Construction & Civil Technology	MPT	Metal Processing Technology
COM	Communication	MSC	Military Science Course
CPP	Computer Programming	MTT	Machine Tool Technology
CTG	Commercial Turf & Grounds Management	NST	Networking Systems Technology
DDT	Design Drafting Technology	PHY	Physics
EDS	Electrical Distribution Systems	PSC	American Government
EET	Electronics Engineering Technology	PST	Powersports Technology
EMS	Engineering/Mathematics/Science	PSY	Psychology
ENT	Entrepreneurship	PTA	Physical Therapist Assistant
EPG	Electric Power Generation Technology	SEM	Seminar
HEO	Heavy Equipment Operations	SPM	Self-paced Mathematics
HET	Heavy Equipment Technology	TAM	Aviation Maintenance
HST	History	WLD	Welding

COURSE REQUISITES

Some courses at Linn State Technical College 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 LSTC 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 LSTC 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 required General Education courses assure that students have a sound base in oral and written English, mathematics, the sciences, and computing skills.

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.

The General Education Core. Students are required to take a basic general education core of a minimum of 19 semester credit hours.

Associate of Applied Science General Education Core Requirements

Area 1. Oral & Written Communication - 6 Credit hours		
Course #	Course Title	Credits
COM 101	English Composition	3
	Or	
COM 110	Honors Composition*	3
	And	
COM 111	Oral Communications	3
	Or	
COM 121	Public Speaking	3
Area 2. Mathematics - 3 Credit Hours		
MAT 115	College Algebra	3
	Or	
MAT 116	College Algebra Using Mathematical Modeling	3
	Or	
MAT 118	Survey of College Mathematics	3
	Or	
MAT 120	Pre-Calculus	5
	Or	
MAT 122	Elements of Calculus	3
	Or	
MAT 123	Calculus I	5
Area 3. Science - 4 Credit Hours		
PHY 100	Physical Science with a laboratory	4
	Or	
PHY 101/102	College Physics with a laboratory	4
	Or	
PHY 103/104	Environmental Science with a laboratory	4
	Or	
PHY 201	General Physics with a laboratory	5
	Or	
	A science course with a laboratory*	4

* Requires Department Approval

Chart continues on next page.

Area 4. Social Science - 3 Credit Hours		
PSC 101	American Government ^{1,2}	3
	Or	
HST 105	American History to 1877 ^{1,2}	3
	Or	
HST 110	American History from 1877 to the Present ^{1,2}	3
Area 5. Technical Literacy - 3 Credit Hours		
CPP 101	Introduction to Microcomputer Usage	3
	Or	
CPP 102	Advanced Microcomputer Usage	3

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.

CERTIFICATE OF PROFICIENCY

A certificate of proficiency is awarded to students who complete a series of courses designed to develop a job skill or competency. Certificate options include a general education core with an emphasis on technical courses. The student must complete the certificate core curriculum and program requirements with a cumulative 2.000 grade point average or better.

CERTIFICATE OF PROFICIENCY GENERAL EDUCATION CORE REQUIREMENTS

Students are required to complete a basic general education core of at least 6 semester credit hours. These general education core courses are selected from: COM 101 or higher and CPP 101 or higher.

ASSOCIATE OF APPLIED SCIENCE DEGREE

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

- | | |
|--|---|
| Automation & Robotics Technology | Heating, Ventilation, & Air Conditioning Technology |
| Automotive Collision Technology | Heavy Equipment Technology |
| Automotive Technology | General Option |
| General Option | CAT Dealer Service Technician Option |
| Light-Duty Diesel Option | Industrial Electricity |
| Aviation Maintenance | Construction Emphasis |
| Commercial Turf & Grounds Management | Electronic Controls Emphasis |
| Computer Programming | Programmable Logic Controllers Emphasis |
| General Option | Machine Tool Technology |
| Web Design Option | Medium/Heavy Truck Technology |
| Construction & Civil Technology | Networking Systems Technology |
| Design Drafting Technology | General Option |
| Electric Power Generation Technology | Telecommunications Option |
| Electrical Distribution Systems | Nuclear Technology |
| Electronics Engineering Technology | Radiation Protection Option |
| General Option | Instrumentation and Control Option |
| Biomedical Engineering Technology Option | Reactor Operations Option |
| | Quality Control Option ** |
| | **Pending approval by the Coordinating Board of |
| | Higher Education |
| | Physical Therapist Assistant |
| | Powersports Technology |

GENERAL EDUCATION and RELATED COURSES

The courses listed below are categorized as follows: Business, Communication, Entrepreneurship, Mathematics, Military Science, Science, Social Science, Technical Foundation, and Technical Literacy. Course numbers less than 100 are considered developmental.

BUSINESS

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. Fundamental principles of accounting for partnerships and corporations and managerial accounting principles and techniques. This course is a combination of lecture and lab. Prerequisite: ACC 103. 3 credit hours.

ACC 110 Automated Accounting. Students work with many types of ongoing computerized accounting systems covering a wide variety of accounting processing. Students develop an understanding of the personnel and payroll records that provide the information required under the numerous laws affecting the operation of the payroll system. Prerequisite: ACC 103. 3 credit hours.

ACC 208 Intermediate Accounting I. 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. 3 credit hours.

BUS 125 Job Search Strategies. This course is designed to help a student through the job search process. This is a step-by-step approach utilizing employment search tools to improve job search skills. 1 credit hour.

BUS 162 College 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 171 Economics. An introduction to economics with emphasis on fundamental principles and their applications to current questions. 3 credit hours.

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 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.

SEM 105 Career Services Seminar. The SEM 105 Career Services Seminar is designed to be a self-paced course. Students in this course will register in the Career Services on-line database. In addition, students will create a resume, participate in a Mock Interview and attend Career Development and/or Strategies for Success Seminars designed to better prepare students for employment. Completion of this course is required for graduation. 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. Prerequisite: Classroom instruction in the ASE mechanical area and instructor's permission. No credit.

COMMUNICATION

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 070 Reading Improvement. This course is for students who need to develop their reading skills for college and/or work. To improve reading comprehension, emphasis will be placed on the identification of main ideas, relevant details, and organizational patterns. Vocabulary development and reading rate will also be addressed. This course is not intended for transfer and does not count toward graduation. Students may be placed in this class based on communication placement test scores. 3 credit hours

COM 096 Introduction to Writing. A developmental writing course for students who need to improve or brush up on writing skills before attempting college-level composition. The course is designed to improve student skills in basic grammar, usage, punctuation, and sentence and paragraph structure. This course is not intended for transfer and does not count toward graduation. Students must achieve a "C" or better to advance to COM 101. Prerequisite: A locally administered writing placement test or satisfactory scores on the ACT, COMPASS or ASSET writing tests will be used to place students in this course. 5 credit hours.

****COM 101 English Composition.** Students learn the writing process, which includes prewriting, drafting, revising, and editing. Students learn to distinguish between fact and opinion, to support opinions with facts, and to organize ideas in a logical manner. Students write a variety of assignments that include the rhetorical modes. Prerequisite: Satisfactory scores on ACT, ASSET, COMPASS, or local writing tests, or a grade of "C" or better in COM 096. 3 credit hours.

****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. Prerequisite: Above average scores on a department-approved placement test. 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. 3 credit hours.

****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. 3 credit hours.

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 190 Writing for the World Wide Web. Writing for the World Wide Web is an introduction to the Web through rhetorical study and practical experience. This course offers an introduction and application of web design, writing, and analysis of web-based publications. Prerequisites: CPP 101 and COM 101 or COM 110. 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: COM 101 or COM 110 with a grade of “C” or better. 3 credit hours.

COM 289 Research Methods in Physical Therapy. Students are taught the sources and methods of literature review and research. Other methods of acquiring information may entail medical case study, clinical observation, and discussion with physical therapy practitioners. Independent projects and an oral presentation are included. Prerequisites: PTA 214, PTA 223, and PTA 224 with a grade of “C” or better and COM 101 or COM 110. 2 credit hours.

COM 290 Introduction to Theatre. This course offers an introduction to the theatrical concerns of acting, voice, and movement. Topics will include listening, improvisation, dramatic reading, monologues, and duet acting. The course will also introduce basic terminology, how to audition, script analysis, and stage set up. Field trips to attend various theatrical performances will also be included. Prerequisite: COM 111 or COM 121 with a grade of “C” or better. 3 credit hours.

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.

ENTREPRENEURSHIP

ENT 100 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

MATHEMATICS

EMS 101 Statistical Process Control. An introduction to measurement principals and data collection, statistical measures of central tendency and dispersion, properties of the normal frequency distribution, application of sampling statistics to X-bar and R charts, and computation and display of process capability indices. 1 credit hour.

EMS 111 Industrial and Shop Math. Practical math as applied to the machinist. Weights and measures, percentage, ratio and proportion, symbols, simple equations, formulas, exponents and directed numbers. Applications to shop situations are emphasized. 3 credit hours.

EMS 112 Trigonometry for Machine Tool. A study of right angle triangles, solving and setting up templates and the solution of oblique triangles. Metrics, tapers, indexing, sinebars, screws, nuts, bolts, pulleys, gears, horsepower, and other machine shop trigonometry applications are studied. 3 credit hours.

EMS 113 Industrial Science. Introduction to Machinery's Handbook and related formulas. Heat treating and metallurgy are discussed with an emphasis on practical application. Review of trigonometry and basic math principles is a part of this course. Prerequisite: EMS 112 with a grade of "C" or better. 3 credit hours.

EMS 116 General Algebra. Topics studied will include the real number system, operations with signed numbers, fractional and non-fractional equations, simplification of fractional expressions, graphing, formula rearrangement, linear equations and inequalities, linear systems, polynomials, factoring rational expressions, exponents and radicals, quadratic equations, and exponential and logarithmic equations. Prerequisite: Satisfactory placement score or MAT 030 with a grade of "C" or better or SPM 030 with a passing grade. 5 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 050 with a grade of "C" or better or SPM 050 with a passing grade. 3 credit hours.

EMS 220 Properties of Materials. Basic characteristics of concrete, steel, aluminum, aggregates, asphalt, soil, masonry and other construction materials; their selection including specifications and utilization in construction projects. 3 credit hours.

EMS 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. Friction is also investigated. Corequisite: MAT 121. 5 credit hours.

EMS 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, analyze nonstandard beams, and design steel reinforced concrete slabs. Prerequisite: EMS 246. 5 credit hours.

***MAT 030 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. 3 credit hours.

***MAT 050 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 030 with a grade of "C" or better or SPM 030 with a passing grade. 3 credit hours.

***MAT 070 Intermediate Algebra with Lab.** 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 050 with a grade of “C” or better or SPM 050 with a passing grade. 3 credit hours.

MAT 111 Trigonometry. This course includes angle-based trigonometric functions and their inverses, multiple angle formulas, identities, trigonometric equations, radian measure, arc length, angular velocity, graphs of trigonometric functions, and solutions of right triangles. This course is intended for use at off-campus locations only. Prerequisite: MAT 070 or SPM 070. 2 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 EMS 116 or MAT 070 with a grade of “C” or better or SPM 070 with a passing grade. 3 credit hours.

****MAT 116 College Algebra Using Mathematical Modeling.** Study of properties and graphs of linear, quadratic, polynomial, exponential, radical, and logarithmic functions with applications. May be substituted for MAT 115. Prerequisite: Satisfactory placement score or EMS 116 or MAT 070 with a grade of “C” or better or SPM 070 with a passing grade. 3 credit hours.

****MAT 118 Survey of College Mathematics.** College mathematics including the following topics: algebra, geometry, trigonometry, counting methods, probability, statistics, consumer finance, and logic. Prerequisite: Satisfactory placement score or MAT 070 or EMS 116 with a grade of “C” or better or SPM 070 with a passing grade. 3 credit hours.

****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 and oblique triangles, trigonometric identities, and the solution of trigonometric equations. Prerequisite: Satisfactory placement score or EMS 116 or MAT 070 with a grade of “C” or better or SPM 070 with a passing grade. 5 credit hours.

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 070 or SPM 070. 3 credit hours.

****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 or both MAT 115 and MAT 121 or MAT 111 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 116 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 030 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 050 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 030 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 070 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 050 with a grade of “C” or better or SPM 050 with a passing grade. No credit.

* Also available as a web-based course.

** This course meets the mathematics general education requirement.

MILITARY SCIENCE

MSC 101 Military Science Course I. This course is part one in the foundation for the Reserve Officer's Training Corps course. During each class session students will be instructed in basic military skills/civilian leadership skills. In addition to classes, there will be various on and off campus field training exercises and physical training sessions. Each class is fifty minutes in length. Registration in this course does not mean the student has enlisted in the military. The student is under no military obligation at this time. 1 credit hour.

MSC 102 Military Science Course II. This course is part two in the foundation for the Reserve Officer's Training Corps course. During each class session students will be instructed in basic military skills/civilian leadership skills. In addition to classes, there will be various on and off campus field training exercises and physical training sessions. Each class is fifty minutes in length. Registration in this course does not mean the student has enlisted in the military. The student is under no military obligation at this time. 1 credit hour.

MSC 201 Military Science Course III. This course is part one in the training/development process of the Reserve Officer's Training Corps. This course is designed to enhance basic military skills and carefully evaluate the student's leadership potential for becoming a commissioned officer if he/she so desires. During the course, students who possess the potential and exhibit the positive desire to continue in the program have the opportunity to apply for various ROTC scholarships and become an ROTC cadet in the Advanced Course as a junior or senior classman. 2 credit hours.

MSC 202 Military Science Course IV. This course is part two in the training/development process of the Reserve Officer Training Corps. The course is designed to enhance basic military skills and carefully evaluate the student's leadership potential for becoming a commissioned officer if he/she so desires. During the course, students who possess the potential and exhibit the positive desire to continue in the program have the opportunity to apply for various ROTC scholarships and become an ROTC cadet in the Advanced Course as a junior and senior classman. 2 credit hours.

SCIENCE

ASC 101 Human Anatomy and Physiology w/Lab. This course is an introductory study of body systems, structures and functions. Emphasis is placed on means of protection, support and movement through a comprehensive study of the nervous, skeletal and muscular systems. This course explores the relationship between the systems. This course is intended to be taught at the Jefferson City campus. 4 credit hours.

****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 050 with a grade of “C” or better or SPM 050 with a passing grade. 4 credit hours.

****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: EMS 116 or MAT 070 with a grade of “C” or better or SPM 070 with a passing grade. Concurrent: PHY 102. 4 credit hours.

****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: EMS 116 or MAT 070 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.

****PHY 103 Environmental Science.** This is an interdisciplinary science course consisting of the study of environmental problems and possible alternative solutions to those problems. Interrelationships and their basis for personal decision making are stressed. Man and his relationship to issues such as the environment, energy, land use, water and air pollution will be explored. Prerequisites: COM 101 or COM 110 and CPP 101 or CPP 102. Concurrent: PHY 104. 4 credit hours.

****PHY 104 Environmental Science Lab.** This is the science lab corresponding to Environmental Science (PHY 103). It will consist of the study of environmental problems and possible alternative solutions to those problems. Both qualitative and quantitative measurements involving man and his relationship to issues such as the environment, energy, land use, water and air pollution will be taken. Prerequisites: COM 101 or COM 110 and CPP 101 or CPP 102. Concurrent: PHY 103. 0 credit hours – all credit given in PHY 103.

****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.

** This course meets the science general education requirement.

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. 3 credit hours.

****HST 110 American History from 1877 to the Present.** History of America from the Civil War to the present. This course will allow students to discuss and explain different events in American History. They will learn to recognize names and events that have consequences in their lives today. A service learning project will be incorporated into this course in which the students will be required to complete a community service activity within a historical sphere. Course readings, discussions, and tests comply with state requirements regarding the Missouri and federal constitutions. 3 credit hours.

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 LSTC. 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. 3 credit hours.

PSY 161 Health Psychology. This course explores the basic principles of human behavior. The student focuses on effective interactions that help the health care 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 health care provider. The mind-body connection is examined, as well as ethical issues related to the health care provided. 3 credit hours.

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

TECHNICAL FOUNDATION

MPT 151 Shop Skills. Advanced principles and fundamentals of SMAW, Oxy-fuel welding, cutting, and brazing, GTAW, GMAW and tool sharpening as applied to auto body and frame repairs. Prerequisite: MPT 165. 3 credit hours.

MPT 165 Basic Welding. Basic principles and fundamentals of SMAW, Oxy-fuel (welding, cutting and brazing), GTAW and GMAW. 3 credit hours.

WLD 120 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.

TECHNICAL LITERACY

****CPP 101 Introduction to Microcomputer Usage.** An introductory course in the fundamentals of using word processing, spreadsheet, and database management application programs. 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.

** This course meets the technical literacy general education requirement.

CURRICULUM



AUTOMATION & ROBOTICS TECHNOLOGY

15.0613

(Associate of Applied Science Degree)

The Automation & Robotics Technology program offers a world-class education in a field that blends high-tech electronics with state-of-the-art mechanical and computer 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 National Association of Industrial Technology (NAIT).

The program prepares students for the work environment with course work focused on design and fabrication of individual piece-parts and flexible machining systems (FMS). This type of automation incorporates computer numerical control (CNC) machining centers, programmable robots, electronically controlled part handling/transfer systems and vision quality control monitoring instruments. This program is designed to provide a broad industrial and technological background for the student to pursue careers as entry-level CNC operators/programmers, electrical maintenance technicians, electronics technicians, machinists, or specialized automation technicians.

An optional eight-week internship is included in the summer semester between the first and second years. The student will perform outlined duties pertaining to their specific program of study.

This program is offered only in Mexico, Missouri, at the Advanced Technology Center.

Program Mission

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 assure that the student has the opportunity to:

- Develop effective oral and written communication skills.
- Develop knowledge and skills necessary to program, set-up, and operate manual and CNC machine tools.
- Develop an analytic approach to problem solving and troubleshooting.
- Demonstrate professional and safety minded practices required by industry standards.
- Demonstrate technical competency in managing and sustaining automated robotic manufacturing cells.

CORE CURRICULUM

			Credit Hours
MAR	101	Introduction to Electricity	4
MAR	111	Mechanical and Fluid Power Transmission	4
MAR	118	Industrial Motors and their Controls	4
MAR	125	Applied Electronics	4
MAR	150	Machine Shop Fundamentals	4
MAR	175	Machine Tool Programming	4
MAR	204	PLC Programming	4
MAR	206	Industrial Robotics	4
MAR	208	Computer Aided Machining	4
MAR	211	Theory of Industrial Automation	2
MAR	215	Introduction to Quality Control	3
MAR	218	Computer Interfacing	3

MAR	221	Mechanical and Electronic Device Troubleshooting	3
MAR	231	CIM Applications	4
Optional:			
MAR	190	Internship I (Optional)	(4)
SUB-TOTAL			51-55

GENERAL EDUCATION REQUIREMENTS

General Education Requirements			19
(see pages 39 & 40)			
Must Include: PHY 101/102 College Physics			4
SUB-TOTAL			19

GRADUATION REQUIREMENT

BUS	125	Job Search Strategies	1
SUB-TOTAL			1

PROGRAM TOTAL 71-75

The following Machining Specialist and Electrical Specialist certificate options have been designed for part-time students. The courses listed in these two certificates will be offered in the same sequence and semester they are being taught for the full-time Automation & Robotics Technology program.

MACHINING SPECIALIST

15.0613

(Certificate)

CORE CURRICULUM

			Credit Hours
MAR	150	Machine Shop Fundamentals	4
MAR	175	Machine Tool Programming	4
MAR	191	Machine Tool Operations	4
MAR	208	Computer Aided Machining	4
MAR	215	Introduction to Quality Control	3
SUB-TOTAL			19

GENERAL EDUCATION REQUIREMENTS

CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			
COM	110	Honors Composition	
OR			
COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
SUB-TOTAL			6

		GRADUATION REQUIREMENT	
BUS	125	Job Search Strategies	1
		SUB-TOTAL	1
		PROGRAM TOTAL	26

ELECTRICAL SPECIALIST
15.0613
(Certificate)

		CORE CURRICULUM	Credit Hours
MAR	101	Introduction to Electricity	4
MAR	118	Industrial Motors and their Controls	4
MAR	125	Applied Electronics	4
MAR	204	PLC Programming	4
MAR	218	Computer Interfacing	3
		SUB-TOTAL	19

		GENERAL EDUCATION REQUIREMENTS	
CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			
COM	110	Honors Composition	
OR			
COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
		SUB-TOTAL	6

		GRADUATION REQUIREMENT	
BUS	125	Job Search Strategies	1
		SUB-TOTAL	1
		PROGRAM TOTAL	26

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: A "C" or higher in MAT 030 or satisfactory placement score into MAT 050 or higher. 4 credit hours.

MAR 103 Introduction to Photonics. This course covers the fundamentals of photonics and optics, the history of the photonics industry, and an introduction to lasers and laser applications. Photonics/laser safety and practices are discussed, emphasized and practiced. Corequisite: MAR 101. 3 credit hours.

MAR 105 Data Collection, Analysis and Reporting. This course is designed to introduce students to crafting technical reports by using data analysis methods, similar to those required in industry. This course is writing intensive and spreadsheet intensive, and will concentrate on correct writing style as well as clear and concise presentation of data and graphs. 1 credit hour.

MAR 111 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. 4 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. 4 credit hours.

MAR 121 Geometric Optics. This course is designed to teach the student the theory of light as a geometric ray. The laws of reflection and refraction from mathematical, graphical and experimental aspects are studied. Computers are used as an aid for graphical and computational requirements. Prerequisite: MAR 103. 2 credit hours.

MAR 123 Wave Optics. This course covers the theory of light as a wave, the units used to measure light and polarization. Interference, holography and other areas that affect light as it propagates through different media are studied. Prerequisite: MAR 121. 2 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. 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: A "C" or higher in MAT 030 or SPM 030 with a passing grade or satisfactory placement score into MAT 050 or higher. 4 credit hours.

MAR 175 Machine Tool Programming. This course is designed to give the student a complete overview on "how to" operate and program computer based industrial machining centers. Emphasis is placed on lathe and mill programming techniques and structures, CNC controller types and overall machine operation. Other topics discussed: machine set-up and tooling, part set-up and inspection and MDI programming. Prerequisite: MAR 150. 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 191 Machine Tool Operations. This course is a continuation of MAR 150 and is designed to give the student more "hands-on" machining time. Basic manual machine tools, such as the lathe and mill, will be used to fabricate numerous basic and intermediate projects to specific dimensions and tolerances. Machining Certificate Only. Prerequisite: MAR 150. 4 credit hours.

MAR 202 Laser System Design. Students will study solid state, semiconductor, atomic gas and molecular lasers in detail, including power supply circuits for each different type. Laser system accessories, including acousto-, electro- and mageneto-optic components will be covered and utilized in a laboratory setting. Students will also be required to build a laser cavity and optimize the output power of that system utilizing information obtained in lecture. Prerequisites: MAR 123, MAR 125, MAR 175, and MAT 115. 4 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. 4 credit hours.

MAR 205 Photonics Applications. This course provides exposure to the various industrial, medical and military laser applications and includes the use of fiber optics in telecommunications. Students will work in a team environment to conduct experiments that demonstrate the various applications for photonics. Prerequisites: MAR 123 and MAR 125. Corequisite: MAT 115. 3 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. Prerequisite: MAR 118. Corequisite: MAR 204. 4 credit hours.

MAR 208 Computer Aided Machining. This course introduces the student, through hands-on experience, the basics of CAD (Computer Aided Drafting) and CAM (Computer Aided Machining). The student will design numerous projects, generate machine tool programs, DNC interface with CNC machine tools and fabricate their designs to reality. Prerequisite: MAR 175. 4 credit hours.

MAR 210 Materials Processing with Lasers. This course studies the various materials that can be processed by a laser beam. The students will work in teams to study and demonstrate the effects that a laser beam has on the respective material. Prerequisites: MAR 123 and MAR 125. Corequisite: MAT 115. 3 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. Prerequisite: Department Chair approval. 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. Prerequisite: MAR 150. 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. 3 credit hours.

MAR 220 Laser System Troubleshooting. This course is designed to provide a comprehensive knowledge of the methods used to troubleshoot and repair problems that occur with laser equipment and its operation. Hands on experience is emphasized. Skill using tools and measurement equipment is developed. Prerequisites: MAR 202 and MAR 210. 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, MAR 204, MAR 206, and MAR 208. 3 credit hours.

MAR 231 CIM Applications. This course is project oriented. The students are required to design a project to be manufactured in the laboratory CIM cell. The student will program the robots at each workstation, program the PLCs, establish the production plan and routing, design and make the necessary tooling and program the CNC machines to manufacture the product. The students will wire the components necessary to run the cell. Teamwork will be emphasized. The students will be expected to utilize all previous courses to accomplish the production of the project. The students will compose a written report of the final project. Prerequisite: MAR 211. 4 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

47.0603

(Associate of Applied Science Degree)

The Automotive Collision Technology program of Linn State Technical College prepares students to take advantage of the opportunities in many related areas which include auto body repair, auto body painting, auto body estimating (shop supervisor) and collision damage estimating (insurance). The Automotive Collision Technology program is certified by the National Automotive Technicians Education Foundation's (NATEF)/Automotive Service Excellence (ASE). The program is also accredited by the National Association of Industrial Technology (NAIT).

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 program or students may choose to pursue a one-year technical certificate in the area of Refinishing & Non-Structural Repair or Structural & Mechanical Repair. The student gets intensive hands-on experience in repairing a variety of damaged vehicles. The auto body shop is well equipped with an extensive inventory of power tools and accessories such as the following:

Kansas Jack Frame Equipment	Car-O-Liner Bench Frame Rack
Kansas Jack Laser Frame & Unibody Alignment System	Car-O-Liner Computerized Measuring System
Sanders	Gas Welders
Hydraulic Power Tools	MIG Welders
Grinders	Centerline Gauge System
Air Tools	Paint Booth
DUZ-MOR Frame Rack	Prep Station
Paint Guns & Equipment	Paint Mixing System

Courses in electrical systems, shop metal and shop management ensure that the student can advance and specialize in the field after gaining employment.

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.

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, 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 electrical knowledge and skills needed to repair and maintain safety devices related to automotive industry.
- Provide the opportunity for students to develop the knowledge and skills necessary to repair, replace and estimate structural and non-structural damages.
- Provide the opportunity for students to develop knowledge and skills necessary in replacing and estimating of non-structural repair procedures.
- Provide an opportunity for students to develop and demonstrate critical thinking skills used in troubleshooting, estimating and repairs in the automotive collision industry.
- Assure that students have the opportunity to develop oral and written communication skills needed in the automotive collision technology field.

CORE CURRICULUM

			Credit Hours
ACT	105	Non-Structural Analysis and Damage Repair	4
ACT	106	Refinishing Techniques I	4
ACT	107	Auto Plastic Repair	3
ACT	108	Refinishing Techniques II	3
ACT	205	Structural Analysis I	4
ACT	206	Structural Analysis II	4
ACT	209	Non-Structural Repair Applications	3
ACT	210	Structural Repair Applications	3
SUB-TOTAL			28

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
SUB-TOTAL			19

PROGRAM REQUIREMENTS

MPT	151	Shop Skills	3
MPT	165	Basic Welding	3
AMT	154	Automotive Electrical Systems	6
AMT	267	Mechanical Systems and Power Accessories	6
SUB-TOTAL			18

GRADUATION REQUIREMENTS

BUS	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	66
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AUTOMOTIVE COLLISION TECHNOLOGY

47.0603

(One-Year Certificate in Refinishing & Non-Structural Repair)

CORE CURRICULUM

			Credit Hours
ACT	105	Non-Structural Analysis and Damage Repair	4
ACT	106	Refinishing Techniques I	4

ACT	107	Auto Plastic Repair	3
ACT	108	Refinishing Techniques II	3
		SUB-TOTAL	14
		GENERAL EDUCATION REQUIREMENTS	
CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			
COM	110	Honors Composition	
OR			
COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
		SUB-TOTAL	6
		PROGRAM REQUIREMENTS	
MAT	030	Preparatory Mathematics	3
AMT	154	Automotive Electrical Systems	6
MPT	151	Shop Skills	3
MPT	165	Basic Welding	3
		SUB-TOTAL	15
		GRADUATION REQUIREMENTS	
BUS	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

AUTOMOTIVE COLLISION TECHNOLOGY 47.0603

(One-Year Certificate in Structural & Mechanical Repair)

CORE CURRICULUM

			Credit Hours
ACT	205	Structural Analysis I	4
ACT	206	Structural Analysis II	4
ACT	209	Non-Structural Repair Applications	3
ACT	210	Structural Repair Applications	3
		SUB-TOTAL	14
		GENERAL EDUCATION REQUIREMENTS	
CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			
COM	110	Honors Composition	
OR			

COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
		SUB-TOTAL	6
		PROGRAM REQUIREMENTS	
MAT	030	Preparatory Mathematics	3
AMT	267	Mechanical Systems & Power Accessories	6
MPT	151	Shop Skills	3
MPT	165	Basic Welding	3
		SUB-TOTAL	15
		GRADUATION REQUIREMENTS	
BUS	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 105 Non-Structural Analysis and Damage Repair. Identifying, analyzing, and repairing non-structural damage to vehicles, including personal safety practices, preparation, panel replacement and alignment. Working with trim and hardware, metal straightening, and repair methods, moveable glass and hardware. 4 credit hours.

ACT 106 Refinishing Techniques I. This course provides students with the basic knowledge and understanding of automotive finishes including preparing the surface for refinishing, preparing the equipment, paint and refinish material, applying the finish, solving paint application problems, and the safety and environmental practices needed in the refinishing process. 4 credit hours.

ACT 107 Auto Plastic Repair. This course covers the identification and repair process of plastic materials currently used in automotive vehicles. Prerequisite: ACT 105. 3 credit hours.

ACT 108 Refinishing Techniques II. This course provides students with an understanding of how light sources, pigments, and application affect color changes in the refinishing/blending process. Students will have the opportunity to apply the proper steps and techniques in a lab environment. Prerequisite: ACT 106. 3 credit hours.

ACT 205 Structural Analysis I. Identifying, analyzing, and repairing underbody structural damage to unibody and frame vehicles. Prerequisites: ACT 107 and ACT 108 with a grade of “C” or better. 4 credit hours.

ACT 206 Structural Analysis II. Identifying, analyzing, and repairing structural damage of vehicle bodies and vehicle body components. Prerequisites: ACT 107 and ACT 108 with a grade of “C” or better. 4 credit hours.

ACT 209 Non-Structural Repair Applications. Theory/application of auto body non-structural systems. Emphasis is given to live and simulated work analysis and repair procedures according to industry specifications. Complete refinishing and color matching. Blending techniques are also included. Safety is stressed. Prerequisites: ACT 205 and ACT 206 with a grade of “C” or better. 3 credit hours.

ACT 210 Structural Repair Applications. Theory/application repair of auto body structural systems. Emphasis is given to live and simulated work analysis and repair procedures, according to industry specifications. Complete refinishing and color matching. Blending techniques are also included. Safety is stressed. Prerequisites: Completed first three semesters. Prerequisites: ACT 205 and ACT 206 with a grade of "C" or better. 3 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 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

GENERAL OPTION

LIGHT-DUTY DIESEL OPTION

47.0604

(Associate of Applied Science Degree)

Linn State Technical College 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 Linn State Technical College is one of only a select few in the country that meet the strict industry standards required for Automotive Service Excellence (ASE) certification by the National Automotive Technicians Education Foundation (NATEF). As a result of its commitment to quality automotive service technology training, Linn State Technical College has been awarded ASE MASTER certification. The Automotive Technology program is also accredited by the National Association of Industrial Technology (NAIT).

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 two Automotive Technology Associate of Applied Science degree options from which to choose. Both 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 internal combustion engines. The Light-Duty Diesel Option also includes instruction in diesel engines. If time allows, students in the General Option may elect to take additional courses in welding 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 the areas of Automotive Transmission/Transaxle, Maintenance and Light Repair, Engine Performance or General Automotive. Automotive Technology certificate students receive supportive training in related fields such as shop math, metal work and technical communications.

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 (MPT 165) 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.

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.
- Provide the opportunity for students to develop critical thinking skills for troubleshooting and diagnostic techniques.
- Provide the opportunity for students to develop technical knowledge and understanding necessary for applied tasks in the 8 Automotive Service Excellence (ASE) areas.
- Assure that the students have the opportunity to develop computer skills to find and research automotive data using multiple software databases and via the Internet.
- Provide the opportunity for students to develop skills in repairing automotive systems.
- Provide the opportunity for students to develop personal social traits, which are essential for the successful automotive technician.
- Provide the opportunity for students to demonstrate a professional attitude toward the automotive industry including continuing education.

CORE CURRICULUM

			Credit Hours
AMT	101	Automotive Electrical/Electronics I	4
AMT	120	Project Management	3
AMT	145	Automotive Engine Mechanical	5
AMT	205	Automotive Braking Systems	4
AMT	206	Automotive Suspension and Steering	4
AMT	203	Automotive Electrical/Electronics III	5
AMT	207	Heating/Air Conditioning	5
AMT	252	Automotive Drivetrains and Axles	8
Optional:			
AMT	191	Internship (Optional)	(6)
MTT	195	Automotive Machining Essentials (Optional)	(3)
SUB-TOTAL			38-47

GENERAL EDUCATION REQUIREMENTS

		General Education Requirements (see pages 39 & 40)	19
SUB-TOTAL			19

PROGRAM REQUIREMENTS

General Option			
AMT	102	Automotive Electrical/Electronics II	4
AMT	134	Automotive Engine Performance	6
SUB-TOTAL			10

OR

Light-Duty Diesel Option			
AMT	242	Light-Duty Diesel Engine Control Systems	5
MHT	255	Engines II	3
MPT	165	Basic Welding	3
SUB-TOTAL			11

GRADUATION REQUIREMENTS

BUS	125	Job Search Strategies	1
SEM	135	Ford Maintenance & Light Repair (MLR) Service Training Seminar	NC
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

68-78

**AUTOMOTIVE TECHNOLOGY
47.0604**

(One-Year Certificates in Automotive Transmission/Transaxle or Maintenance & Light Repair or Engine Performance or General Automotive)

Students may select two specialized certificates or the stand-alone General Automotive Certificate.

CORE CURRICULUM

			Credit Hours
AMT	101	Automotive Electrical/Electronics I	4
AMT	102	Automotive Electrical/Electronics II	4
		SUB-TOTAL	8

GENERAL EDUCATION REQUIREMENTS

CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			
COM	110	Honors Composition	
OR			
COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
		SUB-TOTAL	6

PROGRAM REQUIREMENTS

Automotive Transmission/Transaxle Certificate

AMT	203	Automotive Electrical/Electronics III	5
AMT	252	Automotive Drivetrains and Axles	8
MPT	165	Basic Welding	3
MAT	030	Preparatory Mathematics	3
OR			
SPM	030	Self-paced Preparatory Mathematics	NC
Optional:		*Electives (Optional)	
		SUB-TOTAL	16-19

OR

Maintenance & Light Repair Certificate

AMT	205	Automotive Brake Systems	4
AMT	206	Automotive Suspension & Steering	4
AMT	207	Heating/Air Conditioning	5
MPT	165	Basic Welding	3
MAT	030	Preparatory Mathematics	3
OR			

SPM	030	Self-paced Preparatory Mathematics	NC
Optional:		*Electives (Optional)	
		SUB-TOTAL	16-19

OR

		Engine Performance Certificate	
AMT	134	Automotive Engine Performance	6
AMT	145	Automotive Engine Mechanical	5
AMT	203	Automotive Electrical/Electronics III	5
MAT	030	Preparatory Mathematics	3
OR			
SPM	030	Self-paced Preparatory Mathematics	NC
Optional:		*Electives (Optional)	
		SUB-TOTAL	16-19

OR

		General Automotive Certificate	
MAT	030	Preparatory Mathematics	3
OR			
SPM	030	Self-paced Preparatory Mathematics	NC
		The General Automotive Certificate is a stand-alone certificate, which may not be combined with another Automotive Technology certificate. This certificate is custom-designed with instructor's permission. 16 credits of Automotive Technology courses in addition to the one-year certificate core curriculum are required.	16
		SUB-TOTAL	16-19

		GRADUATION REQUIREMENTS	
BUS	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 **31-34**

		*Optional Electives	
AMT	120	Project Management	3
SEM	135	Ford Maintenance & Light Repair (MLR) Service Training Seminar	NC

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 102 Automotive Electrical/Electronics II. Application/Service of electrical systems generally associated with the automotive engine. Emphasis is put on advanced system diagnostics, engine performance, failure analysis, and proper service procedures. Safety is stressed. Prerequisite: AMT 101 with a grade of "C" or better. 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 134 Automotive Engine Performance. Theory/application/operation and diagnosis of automotive fuel and emission systems. Special emphasis on individual component operation, proper testing and diagnosis. Safety is stressed. 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 154 Automotive Electrical Systems. Construction, operation and servicing of the electrical, air conditioning, and safety systems of the automobile. Battery, starting and generating systems, and power accessories are also covered. 6 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 2.5 GPA in all classes are eligible for the AMT internship. Prerequisites: AMT 101, AMT 102, AMT 145 or AMT 101, AMT 145, MHT 255 and Department Chair approval. 6 credit hours.

AMT 203 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. 5 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 242 Light-Duty Diesel Engine Control Systems. Theory, application, and service of light-duty diesel engine fuel and electronic engine management systems. Prerequisite: AMT 101 with a grade of "C" or better. 5 credit hours.

AMT 252 Automotive Drivetrains and Axles. Theory, application, and service of the components used in automotive and light truck drivetrain systems. Emphasis is given to live work diagnosis, failure analysis, and following proper service procedures as outlined by the manufacturers specifications. Safety is stressed. 8 credit hours.

AMT 267 Mechanical Systems and Power Accessories. Theory/Application/Service of automobile mechanical systems as applied to collision repair. Emphasis is placed on brake, suspension, and steering systems. 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.



Certified Aviation Maintenance Technician
School since 1970

AVIATION MAINTENANCE
47.0607 A/F - 47.0608 P/P
(Associate of Applied Science Degree)

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. Linn State Technical College 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 National Association of Industrial Technology (NAIT).

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 third semester, and the Airframe section by the end of the fourth semester.

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 the technical skills necessary for employment in the aviation maintenance industry.
- Assist students in their preparation to meet the technical knowledge requirement for mechanic certification, required by Federal Aviation Regulation, Part 65.
- Provide the opportunity for students to develop core skills in general education in reading, writing, mathematics, and science reasoning.

CORE CURRICULUM

			Credit Hours
TAM	107	Federal Regulations for Aviation Technicians	2
TAM	109	Aircraft Structural Materials and Corrosion Control	2
TAM	113	General Mechanics	2
TAM	125	Basic Electricity	2
TAM	127	Reciprocating Engines and Lubrication Systems	4
TAM	131	Propeller Systems	2
TAM	134	Turbine Engines and Accessory Systems	4
TAM	136	Powerplant Fuel Systems	2
TAM	139	Powerplant Electrical Systems	4
TAM	200	Auxiliary Systems and Inspections for Powerplants	5
TAM	208	Introduction to Aircraft Welding	2
TAM	211	Assembly and Rigging	2
TAM	213	Sheetmetal and Non-metallic Structures	4
TAM	217	Aircraft Fluid Power Systems	2
TAM	220	Aircraft Covering, Finishes and Woods	2
TAM	224	Aircraft Instrumentation and Avionics Systems	3
TAM	226	Aircraft Electrical Systems	4
TAM	228	Airframe Systems and Inspections	2
		SUB-TOTAL	50

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
	Must Include:	PHY 101/102 College Physics	4
		SUB-TOTAL	19

GRADUATION REQUIREMENT

SEM	105	Career Services Seminar	NC
		PROGRAM TOTAL	69

AVIATION MAINTENANCE

47.0608

(One-Year Certificate in Powerplant)

CORE CURRICULUM

			Credit Hours
TAM	107	Federal Regulations for Aviation Technicians	2
TAM	109	Aircraft Structural Materials and Corrosion Control	2
TAM	113	General Mechanics	2
TAM	125	Basic Electricity	2
TAM	127	Reciprocating Engines and Lubrication Systems	4
TAM	131	Propeller Systems	2
TAM	134	Turbine Engines and Accessory Systems	4
TAM	136	Powerplant Fuel Systems	2
TAM	139	Powerplant Electrical Systems	4
TAM	200	Auxiliary Systems and Inspections for Powerplants	5
TAM	215	Physics for Aviation Maintenance Technicians	1
		SUB-TOTAL	30

GENERAL EDUCATION REQUIREMENTS			
CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			
COM	110	Honors Composition	
OR			
COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
		SUB-TOTAL	6
PROGRAM REQUIREMENT			
MAT	030	Preparatory Mathematics	3
OR			
SPM	030	Self-paced Preparatory Mathematics	NC
		SUB-TOTAL	0-3
GRADUATION REQUIREMENT			
SEM	105	Career Services Seminar	NC
		PROGRAM TOTAL	36-39

AVIATION MAINTENANCE
47.0607
(One-Year Certificate in Airframe)

CORE CURRICULUM			
			Credit Hours
TAM	107	Federal Regulations for Aviation Technicians	2
TAM	109	Aircraft Structural Materials and Corrosion Control	2
TAM	113	General Mechanics	2
TAM	125	Basic Electricity	2
TAM	208	Introduction to Aircraft Welding	2
TAM	211	Assembly and Rigging	2
TAM	213	Sheet Metal and Non-metallic Structures	4
TAM	215	Physics for Aviation Maintenance Technicians	1
TAM	217	Aircraft Fluid Power Systems	2
TAM	220	Aircraft Covering, Finishes and Woods	2
TAM	224	Aircraft Instrumentation and Avionics Systems	3
TAM	226	Aircraft Electrical Systems	4
TAM	228	Airframe Systems and Inspections	2
		SUB-TOTAL	30
GENERAL EDUCATION REQUIREMENTS			
CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			

COM	110	Honors Composition	
OR			
COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
SUB-TOTAL			6
PROGRAM REQUIREMENT			
MAT	030	Preparatory Mathematics	3
OR			
SPM	030	Self-paced Preparatory Mathematics	NC
SUB-TOTAL			0-3
GRADUATION REQUIREMENT			
SEM	105	Career Services Seminar	NC
PROGRAM TOTAL			36-39

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. This course 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. Ground handling and servicing covers shop and flight line safety, including fire safety and procedures, jacking safety and hazardous materials procedures. Towing and taxiing aircraft, including engine-starting procedures are part of the laboratory activities. Tie-down techniques, standard hand signals and fueling safety and procedures are also covered. Servicing with ground power units, oxygen and other related items used on aircraft are discussed and performed in the laboratory. Fluid lines and fittings are covered in this course. 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: Weight and Balance, Ground Operation and Servicing, 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 turbine 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 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 215 Physics for Aviation Maintenance Technicians. Physics concepts with particular application in the aviation maintenance field are covered in this lecture/laboratory course. Standard topics of matter, energy, work, power, force, motion, and gas and fluid mechanics are included. These principles, together with Newton's laws and atmospheric science are then used to introduce aerodynamics for fixed and rotor wing aircraft. The general curriculum subject included in this course and required by FAR Part 147, Appendix B, is Basic Physics. 1 credit hour.

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.

COMMERCIAL TURF & GROUNDS MANAGEMENT

01.0607

(Associate of Applied Science Degree)

The Associate of Applied Science degree program in Commercial Turf & Grounds Management is designed to prepare students to enter careers as assistant golf course superintendents or as specialists in other areas of turf and landscape management. Graduates may find employment in maintaining golf courses, parks, recreational facilities as well as grounds of large commercial buildings, malls and college campuses.

The *Golf Course Superintendents Association of America (GCSAA)* estimates the average salary of an assistant superintendent at an 18-hole golf course in Missouri to be \$31,762 compared to a national average of \$34,586. The same organization also reports that the superintendent at an 18-hole course in Missouri has an average salary of \$64,316 with a national average of \$68,459 (GCSAA 2005 Compensation and Benefits Report.)

According to the *Professional Landcare Network (PLANET)*, there are ample career opportunities in the green industry. Recent commercial and residential construction has increased the demand for qualified lawn care and landscape maintenance technicians who design, install, and care for these properties. In 2006, the *U.S. Department of Labor Bureau of Labor Statistics* estimates that first-line supervisors of landscaping and lawn care workers earned an average of \$43,170 in Missouri. Employment of these supervisors is expected to increase by about 22 percent between 2002 and 2010.

The program at Linn State Technical College is unique in that some courses are delivered in eight-week blocks. Internships are required and students finish the first year and second year curriculum in early March respectively. Graduates as well as interns are available to industry in early March when golf courses, landscapers and lawn care companies are actively looking for qualified personnel. The curriculum is rigorous, fast-paced and designed to emphasize problem solving skills as well as critical thinking. Students will also complete the college's core of general education courses in order to receive a degree. The program is both physically and mentally challenging. Classes are small and students receive individualized attention as well as hands-on training.

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 student the opportunity to develop the knowledge and skills necessary to succeed in the commercial turf and grounds management industry.
- Provide the student the opportunity to develop the attitudes to assure an appreciation of the dignity of work and the satisfaction of a job well done.
- Provide the student the opportunity to develop the knowledge and/or credentials necessary to obtain certain state and professional licensures and/or certifications.
- Provide the student the opportunity to demonstrate analytic problem solving and critical thinking skills.

CORE CURRICULUM

			Credit Hours
CTG	106	Fundamentals of Turf and Grounds	3
CTG	110	Soils & Fertilizers	3
CTG	109	Equipment Operations and Maintenance	3
CTG	116	Plant Propagation	3
CTG	107	Turfgrass Management I	3
CTG	117	Commercial Site Contracting	3
CTG	120	Commercial Turf & Grounds Internship	8
CTG	201	Weeds and Diseases	3
CTG	204	Insects and Pests	3

CTG	209	Landscape Design and Installation	3
CTG	206	Irrigation & Drainage	3
CTG	216	Woody Plant Identification	3
CTG	217	Herbaceous Plant Identification	3
Any two of the following three:			
CTG	207	Turfgrass Management II	3
CTG	210	Computer Aided Landscape Design	2
CTG	220	Basic Shop for Horticulture	2
SUB-TOTAL			48-49

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
Must Include: PHY 103/104 Environmental Science			4
OR			
A science course with lab approved by CTG department chair.			4
SUB-TOTAL			19

PROGRAM REQUIREMENTS

BUS	211	Management	3
CTG	105	Missouri Pesticide Application	1
SUB-TOTAL			4

***GRADUATION REQUIREMENTS**

SEM	110	Spanish Language and Hispanic Culture	NC
BUS	125	Job Search Strategies	1
SUB-TOTAL			1

PROGRAM TOTAL **72-73**

***NOTE:** *Graduation requirements also include:
CPR & Safety Certification*

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 110 Soils and Fertilizers. A study in the origin and formation of soils with emphasis on physical and biological properties including basic principals of soil dynamics, texture, moisture, and organic matter. Chemical properties of fertilizer and use in relation with soil properties, environmental conditions and applications are considered. Economic factors of macronutrients and micronutrients are emphasized as well. 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. Prerequisite: MAT 030 with a grade of “C” or better or SPM 030 with a passing grade. 3 credit hours.

CTG 120 Commercial Turf and Grounds Internship. 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. Prerequisite: Department Chair approval. 1 to 8 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 209 Landscape Design and Installation. A study of the principals of landscape design including an appreciation of various artistic and design theories utilized to produce a professional presentation. Emphasis is placed upon practical application as well as installation practices. 3 credit hours.

CTG 210 Computer Aided Landscape Design. A course designed to utilize the skills developed in landscape design on a personal computer. The landscape design process will be made easier, and will come to life with the use of various design software and databases. Prerequisite: CTG 209 with a grade of “C” or better. 2 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 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 PROGRAMMING

GENERAL OPTION

WEB DESIGN OPTION

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 position using multiple programming languages. The program is accredited by the National Association of Industrial Technology (NAIT).

Students have two programming options from which to choose. Both options give students a solid foundation in operating platforms, programming, database systems, system analysis and design as well as the opportunity to develop their skills in internship experiences. The General Option exposes students to many business related languages giving them a choice for advanced level coursework. The Web Design Option focuses on programming languages used in web design.

Students are also exposed to networking concepts and troubleshooting on both PCs and the AS/400. 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 Programming Department at Linn State Technical College.

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

Program Mission

The mission of the Computer Programming program is to offer a highly specialized, advanced technical education and interpersonal skills necessary for a challenging career as a Computer Programmer. The program offers two options and advanced course topics in which students can specialize. Oral and written communications are a part of the technical education as well as in the general education courses.

Program Goals

The goals of the program are to:

- Assure the program offers the opportunity for students to develop oral and written communication skills.
- Assure the program offers the opportunity for students to develop analytical approaches to problem solving.
- Provide an environment that allows the opportunity to develop the knowledge and skills in programming in C#, JAVA, COBOL, HTML, and Visual Basic.
- Provide an environment that allows the opportunity to develop the knowledge and skills in database management.
- Provide an environment that allows the opportunity to develop the knowledge and skills in web design.

CORE CURRICULUM

			Credit Hours
CPP	133	Operating Platforms	3
CPP	120	Introduction to Computer Programming	2
CPP	122	Visual Basic Programming	3
CPP	140	Internship I (Required)	4
CPP	222	Database Systems Management and Design	3
CPP	223	Advanced Database Systems Management and Design	3
CPP	245	C# Programming	3
CPP	237	Internet Programming	3
CPP	260	System Analysis and Design	3
Optional:			
CPP	141	Internship II (Optional)	(4)
		SUB-TOTAL	27-31

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
	Must Include: PHY 101/102 College Physics		4
	SUB-TOTAL		19

PROGRAM REQUIREMENTS

		General Option	
BUS	211	Management	3
CPP	125	COBOL Programming Language	3
NST	101	Network Fundamentals	3
COM	211	Technical Writing	3
CPP/ NST	Elective	Student must complete at least nine additional credit hours by selecting three approved CPP courses or two approved CPP courses and one approved NST course.	9
		SUB-TOTAL	21

OR

		Web Design Option	
CPP	218	Internet Programming II	3
NST	205	Linux Administration and Installation	3
NST	210	Microsoft Network Administration	3
NST	101	Network Fundamentals	3
COM	211	Technical Writing	3
BUS	211	Management	3
CPP	Elective	Student must complete at least three additional credit hours by selecting one approved CPP courses.	3
		SUB-TOTAL	21

GRADUATION REQUIREMENTS

BUS	125	Job Search Strategies	1
		SUB-TOTAL	1

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

PROGRAM TOTAL

68-72

CPP 101 Introduction to Microcomputer Usage. An introductory course in the fundamentals of using word processing, spreadsheet, and database management application programs. 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 106 Microsoft PowerPoint. This course provides participants with the fundamentals through advanced features of Microsoft PowerPoint to plan, create, and produce professional presentations. The following concepts are covered: managing files; developing, organizing, editing and enhancing content; applying and modifying design templates; inserting and modifying text and images; using drawing tools; importing data from other sources; creating and modifying charts, diagrams, graphs, and tables; adding movement, interaction, sound, and music; showing movie clips; preparing presentation handouts and supplements for printing; running a slide show; preparing and broadcasting a presentation to the Web. 2 credit hours.

CPP 108 Microsoft Publisher. This course covers the fundamentals through advanced features and functions of Microsoft Publisher. Topics include creating and editing single and multi-page publications; working with columns; importing and arranging text, pictures, and graphics; formatting and wrapping text around graphics; creating and formatting tables; creating common page elements; and working with master pages. Advanced topics such as the following are also included: how to flow text across text boxes; creating a facing-pages layout; exporting publications to PDF; and preparing publications for commercial printing. 3 credit hours.

CPP 110 Microsoft Outlook. This course covers how to use Microsoft Outlook utilities to become proficient in using Outlook to send and receive e-mail; schedule meetings, events and tasks; make journal entries; maintain contact lists, to-do lists, and notes. 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 114 Microsoft Word. This course develops fundamentals through advanced skills in using Microsoft Word to create and modify complex documents. The following concepts are covered: creating, saving, and printing a document; editing and managing documents; formatting characters and paragraphs; using spellchecker, autocorrect, thesaurus, word count and grammar tools; conducting find and replace actions; using autotext; manipulating tabs; merging documents; creating headers, footers, footnotes and end notes. Advanced concepts such as the following are also 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. 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 118 Microsoft Excel. This course presents students with the fundamentals through advanced features of Microsoft Excel. The following concepts are covered: Excel interface and navigation; using formulas and functions to analyze data; creating, formatting, and modifying worksheets and workbooks. Advanced concepts such as the following are also 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.

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 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 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 OPNQRYP creating their own commands and applying contextual help to their commands. 3 credit hours.

CPP 260 System Analysis and Design. The class seeks to systematically analyze data input or data flow, processing or transforming data, data storage and information output within the context of a particular business scenario. 3 credit hours.

CPP 299 Special Topics in Computer Programming. Special Topics in Computer Programming (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.

CONSTRUCTION & CIVIL TECHNOLOGY

15.0201

(Associate of Applied Science Degree)

Construction industry employment currently accounts for approximately five percent of the total workforce. Recent reports by the Department of Labor indicate that over the next several years this percentage will likely increase. Nationwide, the country will need more than 210,000 engineering technicians annually for the next ten years.

The employment of construction managers is expected to increase faster than the average for all related occupations through the year 2008 as the level of construction activity and complexity of construction projects continues to grow. In addition, many job openings will result annually from the need to replace workers who transfer to other occupations, leave the labor force and/or retire. Increased spending on the Nation's infrastructure -- highways, bridges, dams, water and sewage systems and electric power generation and transmission facilities -- will result in a greater demand for construction managers, engineers and civil technicians. The increasing complexity of construction projects as well as the proliferation of laws setting standards for buildings and construction materials will increase the demand for applicants in this field.

Traditionally, persons advance to construction management positions after having substantial experience as construction craft workers or having worked as construction supervisors or as independent contractors. With the recent rapid changes in technology this is no longer the case. Construction managers in the 21st century will require considerably more technical training as they face increasingly more complex challenges. They will require significantly more and better professional technical training as they oversee the development, construction/reconstruction and maintenance of the nations infrastructure and related civil works. Tomorrow's construction manager will be given the designs for buildings, roads, bridges, or other projects and they will then oversee and execute the organization, scheduling and implementation of those designs. They will be responsible for coordinating and managing people, materials and equipment, budgets, schedules and contracts and the safety of employees and the general public.

The Linn State Technical College Construction & Civil Technology curriculum is designed specifically to meet these challenges. Included in this curriculum are professional courses in surveying, scheduling, cost control, construction methods, construction materials and construction safety as well as training on specific systems necessary to assure a functional and economic project.

It is a graduation requirement of the Construction & Civil Technology (CCT) program for students to earn a grade of "C" or better in all "Core Curriculum" and "Program Requirements" courses. The attendance policy for the Construction & Civil Technology student is also stricter than the college wide policy. Students should be aware that, in addition, they might also be subject to random drug testing as a safety precaution.

Program Mission

The mission of the Construction & Civil Technology program is a specialized technical program offering associate-level advanced technical education in current and future civil and construction engineering curriculums devoted to the development of engineering technicians, material testing personnel, land surveyors, construction estimators, construction management trainees and other personnel engaged in the fields of civil and construction engineering technology.

Program Goals

The goals of the program are to:

- Assure that the student has the opportunity to demonstrate oral and written communication skills.
- Assure that the student has the opportunity to demonstrate analytical approaches to problem solving.
- Assure that the student is given the opportunity to demonstrate engineering technician skills.
- Assure that the student is given the opportunity to demonstrate project management skills.
- Assure that the student is given the opportunity to develop a professional systematic approach to performing leadership challenges.

CORE CURRICULUM

			Credit Hours
CCT	105	Construction Mathematics	2
CCT	135	Engineering Documents	3
CCT	140	Surveying I w/Lab	3
CCT	147	Construction Techniques and Codes	3
CCT	195	Construction Safety	3
CCT	202	Construction Materials Testing w/Lab	3
CCT	208	Construction Estimating w/Lab	4
CCT	220	Contract Administration/Contract Law	3
CCT	230	Surveying II w/Lab	3
CCT	271	Construction Management	3
Optional:			
CCT	145	Fundamentals of Land Surveying (Optional)	(3)
CCT	191	Civil/Construction Internship (Optional)	(6)
CCT	235	Legal Aspects of Boundary Surveying (Optional)	(3)
SUB-TOTAL			30-42

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
		Must Include: COM 111 Oral Communications	3
		Must Include: PHY 101/102 College Physics	4
SUB-TOTAL			19

PROGRAM REQUIREMENTS

MAT	121	Trigonometry	3
EMS	246	Statics	5
EMS	247	Strength of Materials	5
DDT	111	Civil Drafting	3
DDT	183	Fundamentals of Computer Aided Drafting (CAD)	3
SUB-TOTAL			19

GRADUATION REQUIREMENTS

BUS	125	Job Search Strategies	1
SUB-TOTAL			1

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

PROGRAM TOTAL

69-81

CCT 105 Construction Mathematics. This course focuses on practical mathematical computations required for various construction and civil applications. Areas, volumes, conversions, scaling and measurement of materials are emphasized. 2 credit hours.

CCT 135 Engineering Documents. Blueprint reading, development and analysis of computer aided project plans and specifications, understanding electrical and mechanical schematics and other documents used in construction. 3 credit hours.

CCT 140 Surveying I w/Lab. A basic course in surveying including theory, principles, and practices of surveying with emphasis on basic computations and safe operation of equipment including the surveyor's tape, level, and total station. 3 credit hours.

CCT 145 Fundamentals of Land Surveying. This course teaches elements that provide the student with the appropriate knowledge to perform any property survey. The student will examine evidence of ownership, historical information, property descriptions and legal requirements for recording documents. Applications of the Missouri Minimum Standards, American Land Title Association (ALTA)/American Congress on Surveying & Mapping (ACSM) Surveys and FEMA Certifications are also studied. 3 credit hours.

CCT 147 Construction Techniques and Codes. An introductory course in construction management, which provides a survey of light, civil, heavy highway and utility construction practices. Includes introduction to use of national, state, and local regulations applicable to specifications and performance of building construction standards. 3 credit hours.

CCT 191 Civil/Construction Internship. A planned work experience in an industry or business directly related to the implementation and management of a construction project. The student will be employed directly by an industry or business, and both parties will submit reports and evaluations of experiences to the Department Chair. 6 credit hours.

CCT 195 Construction Safety. This course reviews existing occupational safety and health standards and codes as they relate to the construction industry, and the practices utilized to comply with these regulations. Students who successfully complete this class will be prepared to complete industry safety certification tests. 3 credit hours.

CCT 202 Construction Materials Testing w/Lab. Construction materials testing and inspection procedures in laboratory and field situations. Testing soils, aggregates, concrete, and asphalt relative to AASHTO, ASTM and other construction testing standards, maintaining laboratory reports and performing hands-on as well as simulated field inspections. 3 credit hours.

CCT 208 Construction Estimating w/Lab. A study in estimating techniques and methods pertaining to residential, commercial, industrial and civil construction. Quantity takeoffs, unit pricing, estimate development, blueprint reading, resource pricing, and bidding procedures will all be covered. Introduction to computer estimating using estimating software. Prerequisite: CCT 147. 4 credit hours.

CCT 220 Contract Administration/Contract Law. Administration and understanding of construction contracts, contract documents, contract law, claim avoidance, record keeping, taxes, insurance and bonds, case studies. Subjects to be covered include types of contracts, conditions of contract, interpretation of contracts, preparation of legal bids, termination of contracts, disputes, ethics and professional liability. 3 credit hours.

CCT 230 Surveying II w/Lab. This course teaches the theory and practice of highway and railroad surveying. Geographic Information Systems (GIS) and Geographic Positioning Systems (GPS) are introduced. Prerequisite: CCT 140. 3 credit hours.

CCT 235 Legal Aspects of Boundary Surveying. This course includes legal principles of surveying; Missouri survey law; and principles of boundaries, property, monumentation, deed interpretations, professional liability and ethics. Prerequisite: CCT 140 or CCT 145. 3 credit hours.

CCT 271 Construction Management. Planning and designing the master plan for construction of a major project. Case studies and site visits to existing projects under construction, as well as all of the course materials presented throughout the CCT program. Participants will be required to complete a class project that identifies and describes each of the projects components including a safety plan (OSHA), environmental analysis and an estimate of the resources required to complete the project. Written and oral presentation of the project will also be required. 3 credit hours.

CCT 299 Special Topics in Construction & Civil Technology. Special Topics in Construction & Civil Technology (CCT) may include instruction on topics not covered in other CCT courses. Topics covered in other CCT 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.



DESIGN DRAFTING TECHNOLOGY

15.1301

(Associate of Applied Science Degree)

Linn State Technical College's Design Drafting Technology (DDT) program has been awarded program certification by the American Design Drafting Association (ADDA), a nationally recognized professional drafting association, which assures a quality program that benefits both education and industry. The DDT program is also accredited by the National Association of Industrial Technology (NAIT). Graduates of this program are qualified to take positions as industrial and architectural designers, engineering technicians, cost estimators, and quality assurance technicians. Drafting and design technicians often assist engineers and architects with design and development work.

Drawings are produced by using standard drafting equipment or by using computer aided drafting (CAD). Using engineering data, specifications and various equipment, drafting 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.

Most drafters work from rough sketches, specifications and technical data furnished by engineers. Their job is to transform these ideas into precise drawings. Drafters use handbooks and tables for computations concerning strength, reliability and cost of materials.

The Design Drafting Technology program of Linn State Technical College is thorough and comprehensive, with a balanced mix of mechanical, architectural, civil, and structural drafting. The department has two state-of-the-art CAD labs with AutoCAD, SoftPlan, Autodesk Architectural Desktop, and MicroStation software. Students work on traditional drawing boards and networked PC's. Students are scheduled in small classes to ensure individual attention and quality instruction. The Associate Degree program is rounded out with supporting math and communications courses. A drafting internship is available for students after the completion of specific course work. An internship is not a program requirement for graduation.

Enrollment in the Design Drafting 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.

Program Mission

The Design Drafting Technology program is a technical program constructed to provide to the students 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, engineering technicians, cost estimators and quality assurance technicians in the fields of mechanical, architectural, civil, and structural drafting.

Program Goals

The goals of the program are to:

- Assure that the student is given the opportunity to attain the technical knowledge to transform ideas to precise drawings using problem-solving skills.
- Assure that the student is given the opportunity to attain the drafting skills, by manual and computer methods, using state-of-the-art equipment and software.
- Assure that the student has the opportunity to attain math skills to solve design problems and compute strengths, reliability, and cost.
- Assure that the student has the opportunity to attain effective communications skills.

CORE CURRICULUM

			Credit Hours
DDT	111	Civil Drafting	3
DDT	150	Fundamentals of Drafting	3
DDT	153	Industrial Graphics	3
DDT	183	Fundamentals of Computer Aided Drafting (CAD)	3
DDT	151	Mechanical Drafting with Dimensioning and Tolerancing	3
DDT	154	Industrial Design	3
DDT	184	Advanced Applications of Computer Aided Drafting and Design (CADD)	3
DDT	250	Residential Architectural Drafting	3
DDT	253	Residential Architectural Detailing and Design	3
DDT	252	Structural Steel Drafting	3
DDT	254	Structural Detailing and Design	3
Optional:			
DDT	163	Design Drafting Internship (Optional)	(6)
		SUB-TOTAL	33-39

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
	Must Include:	PHY 101/102 College Physics	4
		SUB-TOTAL	19

PROGRAM REQUIREMENTS

MAT	121	Trigonometry	3
EMS	246	Statics	5
EMS	247	Strength of Materials	5
COM	211	Technical Writing	3
		SUB-TOTAL	16

GRADUATION REQUIREMENT

BUS	125	Job Search Strategies	1
		SUB-TOTAL	1

PROGRAM TOTAL

69-75

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. Beginning course stressing care and use of drafting instruments, lettering techniques, drafting terms, ANSI specification, 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. Pictorial representations using standard types of projection, emphasizing sketching, 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. 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 250 Residential Architectural Drafting. Fundamentals of architectural terms as applied in construction. Techniques in designing residential buildings. Prerequisites: DDT 154 and DDT 184. 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 253. 3 credit hours.

DDT 253 Residential Architectural Detailing and Design. Planning and designing floor plans, elevations, foundations, details and sections of buildings. Dimensioning techniques will be emphasized for accuracy. Prerequisite: DDT 250. 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 Design Drafting Technology. Special Topics in Design Drafting 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.

ELECTRIC POWER GENERATION TECHNOLOGY

47.0101

(Associate of Applied Science Degree)

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-generational power, or peak power. The program provides instruction in basic electricity, prime movers, motors, switchgears and governors.

Employment opportunities for EPG graduates include but are not limited to power generation technician, 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 another participating power generation company.

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 in Heavy Equipment Technology (HET) or Industrial Electricity (IEL) or Medium/Heavy Truck Technology (MHT). The HET, IEL, or MHT internship is required for those students who wish to obtain a second degree in EPG. The EPG Associate of Applied Science degree is a fast-paced accelerated program designed to produce highly skilled EPG technicians. A second Associate of Applied Science degree in EPG may be completed in one to two semesters if scheduling permits.

It is a graduation requirement that a grade of "C" or better must be maintained in all Electric Power Generation Technology (EPG) courses.

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 Electric Power Generation industry.

Program Goals

The goals of the program are to provide opportunities for students to develop and demonstrate:

- Electrical knowledge and skills needed to install, maintain, diagnose, and service electric power generators.
- Knowledge and skills necessary to install, maintain, diagnose, and service multi-fuel engines and prime movers.
- Knowledge and skills necessary to install, maintain, diagnose, and service motors, controls, switches, regulators, governors and generators/alternators as they relate to electrical power generation equipment.
- Critical thinking skills used in troubleshooting.
- Oral and written communications skills needed in the electric power generation industry.

CORE CURRICULUM

			Credit Hours
EPG	130	Generators and Alternators	2
EPG	150	Governors	2
EPG	200	Internship	8
OR			
HET	191	Internship I	8
OR			
MHT	102	Internship	8

OR			
IEL	230	Industrial Electricity Internship I	4
		AND	
IEL	Electives	Student must complete four additional credit hours of approved IEL courses.	4
EPG	210	Engine/Generator Instruments and Controls	2
EPG	220	Generators and Prime Mover Protection	2
EPG	230	Electric Power Generator Application and Installation	2
EPG	270	Troubleshooting Prime Movers and Generators	3
		SUB-TOTAL	21

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
		SUB-TOTAL	19

PROGRAM REQUIREMENTS

HET	145	Engines I	3
OR			
MHT	145	Engines I	
HET	255	Engines II	3
OR			
MHT	255	Engines II	
IEL	102	Safety and Accident Prevention	2
IEL	115	Basic Motor Controls	3
IEL	117	Circuitry Fundamentals w/Lab	4
IEL	122	Power Regulation	2
COM	211	Technical Writing	3
OR			
COM	201	Occupational Communication	
Elective		Heavy Equipment Technology A.A.S. degree graduates will be required to take an approved three credit elective.	3
		SUB-TOTAL	20-23

GRADUATION REQUIREMENT

BUS	125	Job Search Strategies	1
		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 61-64

EPG 130 Generators and Alternators. This course teaches the construction and operation of single and 3-phase units. Also covered are various loads, special applications, temperature, and environmental concerns. 2 credit hours.

EPG 150 Governors. This course teaches the operation and maintenance of all types of governors. Also covered is the installation of governors from mechanical to electronic. Prerequisites: HET 145 or MHT 145 and HET 255 or MHT 255 with a grade of "C" or better. 2 credit hours.

EPG 200 Internship. The Electric Power Generation Technology Internship is comprised of work experience in the electrical generating industry requiring the student to perform a variety of tasks. Program objectives, students' educational objectives, and employer's on-the-job training capabilities determine internship content, hours and objectives that will be documented in each student's internship agreement. 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.

EPG 210 Engine/Generator Instruments and Controls. This course teaches controls of the prime mover and the generator. The operation and troubleshooting of gauges, breakers, relays, controllers, and transformers are included. 2 credit hours.

EPG 220 Generators and Prime Mover Protection. This course teaches protection devices that control the prime mover and generator. Switchgears, sensors, thermo switches, relays, cooling, ventilation, and other electrical and electronic controllers are surveyed in this course. 2 credit hours.

EPG 230 Electric Power Generator Application & Installation. This course teaches the different systems that are important when installing a generator. Systems covered include: air, cooling, exhaust, fuel, starting, mounting, ventilation, and noise. Room design and sizing are also covered. 2 credit hours.

EPG 270 Troubleshooting Prime Movers and Generators. This course teaches the troubleshooting skills used to effectively locate and repair failures of the power generator equipment and control systems. 3 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.



ELECTRICAL DISTRIBUTION SYSTEMS

46.0303

(Associate of Applied Science Degree)

The Electrical Distribution Systems program prepares individuals to climb wood pole structures, build and maintain electrical distribution systems (both overhead and underground), use safe work practices, first aid, and pole top rescue. Students will also receive a strong foundation in math, communication, and critical thinking skills. The students will be required to participate in an approved internship. This field has a high demand for experienced individuals resulting in relatively high pay. Students who graduate from this program will have attained the basic knowledge in the understanding of distribution systems. This will prepare the student for employment in the field with an advanced apprenticeship rating.

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.

The Electrical Distribution Systems program at Linn State Technical College is taught on a full-time basis and provides extensive hands-on training in small classes taught by faculty who have worked in the related field. The Electrical Distribution Systems program is accredited by the National Association of Industrial Technology (NAIT).

Courses in climbing skills, pole framing, equipment operation, transformers and transformer theory, and general studies will develop the competencies of the electrical line worker. All students become CPR certified, and safety and electrical code requirements are stressed in all classes.

A grade of “C” (72%) must be maintained in all courses, including the internship, as part of the graduation requirement. The attendance policy for Electrical Distribution Systems students is also stricter than the college-wide policy. Students should be aware that, in addition, they might also be subject to random drug testing as a safety precaution. 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).

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 as an above average entry level employee.

Program Goals

The goals of the program are to:

- Provide students the opportunity to demonstrate effective communication skills both verbally and written.
- Provide students the opportunity to develop skills necessary for computing of mathematics for the figuring of electrical loads, weights, and measures.
- Provide students the opportunity to develop industry wide safe work practices per American Public Power Association guidelines.
- Provide students the opportunity to develop the necessary skills to gain entry-level employment in the electrical field.

CORE CURRICULUM

			Credit Hours
EDS	105	Electrical Distribution Systems	2
EDS	202	Safety and Accident Prevention	3
EDS	205	Climbing Skills	2
EDS	210	Pole Framing and Construction Specifications	3
EDS	220	Equipment Operation	3
EDS	225	Setting and Replacing Poles	2
EDS	235	Utility Internship	8
EDS	237	Transformer Theory and Installation	5
EDS	241	Conductor Installation, Service and Metering	4
EDS	251	Rubber Gloving and Underground Distribution	4
EDS	271	Fusing, Substation and Voltage Regulation	3
		SUB-TOTAL	39

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
	Must Include:	PHY 101/102 College Physics	4
		SUB-TOTAL	19

PROGRAM REQUIREMENTS

IEL	117	Circuitry Fundamentals w/Lab	4
EMS	120	Trigonometry for Industrial Electricity	3
		OR	
MAT	121	Trigonometry	
COM	201	Occupational Communication	3
		OR	
COM	211	Technical Writing	
		SUB-TOTAL	10

GRADUATION REQUIREMENT

BUS	125	Job Search Strategies	1
		SUB-TOTAL	1

PROGRAM TOTAL

69

EDS 105 Electrical Distribution Systems. 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. 2 credit hours.

EDS 202 Safety and Accident Prevention. The student will gain the knowledge of the hazards associated with electrical distribution systems. The pupil will be able to administer the proper climbing techniques, Safety Rules and Safe Work Practices from the American Public Power Association Safety Manual, successful completion of Cardiopulmonary Resuscitation (CPR) and First Aid, which will enable the student to be certified in Red Cross First Aid and CPR certification. The student will learn OSHA rules and regulations associated with this industry, reporting and the penalties that pertain to these regulations. 3 credit hours.

EDS 205 Climbing Skills. The student will gain the knowledge of the proper care of climbing tools, and the mastering of 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. Successful completion of timed pole top rescue in two different methods. An introduction to aerial pole framing is included in this discipline. Prerequisite: EDS 202. 2 credit hours.

EDS 210 Pole Framing and Construction Specifications. This will give the student a working knowledge of the RUS 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. The student will be able to recognize the different types of materials used for the different types of construction by sight and definition. The pupil will be required to demonstrate the working specification knowledge both in an aerial and a ground situation as well as installation and repair of 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 NESC clearances will be included. Prerequisite: EDS 202. 3 credit hours.

EDS 220 Equipment Operation. This course provides classroom instruction and actual truck driving experience intended to enable the student to obtain a Class A Commercial Driver's License. The student will also 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 taught the basic operation of trencher/backhoe equipment. This section 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 equipment. Prerequisite: EDS 202. 3 credit hours.

EDS 225 Setting and Replacing Poles. The student will learn the basic principles in setting and replacing poles. There will be an emphasis on the proper use of cover-up material and vehicle grounding practices while the electric lines are energized. Temporary pole supports, rigging and worksite hazard protection will also be recognized. Prerequisite: EDS 202. 2 credit hours.

EDS 235 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 from the instructor. The instructor will check with the student on the jobsite to be sure that the requirements for the internship are being administered. This course will be completed between the second and fourth semesters of the Electrical Distribution Systems program. The student will be required to successfully complete this course to complete the Associate of Applied Science Degree. Prerequisites: EDS 205, EDS 210, EDS 220, and EDS 225. 8 credit hours.

EDS 237 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, RUS specifications and pole framing. Basic troubleshooting practices and current and potential transformers will also be included. Prerequisites: EDS 105 and EDS 235. 5 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 105 and EDS 235. 4 credit hours.

EDS 251 Rubber Gloving and Underground Distribution. 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. Students will be exposed to the care and well-being of soft and hard shell rubber goods and their application. Students will also receive instruction on personal protective equipment, hot-line tools, live-line maintenance and will also review the safe operation of aerial platforms and grounding practices. Additionally, the student will gain working knowledge of URD systems. Students will receive practical experience in the direct burial of primary and secondary cables, installation of 200 and 600 amp elbows, splices, lightning arrestors and overhead terminations. The installation will also be covered. The requirements of shoring and sloping of trenches required by the safe work practices will be used in practical experience. Troubleshooting of primary and secondary cable fault locating, review of backhoe/trencher operation and safe work practices and procedures are also covered. Prerequisites: EDS 105 and EDS 235.

EDS 271 Fusing, Substation and Voltage Regulation. The student will be familiarized with 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 in the grounding, inspection, maintenance and operation of basic substations will be expanded. The student will learn to install and operate single- and three-phase pole mount reclosures, gang operated air break and load break switches, and substation fuses and reclosures. This course will also cover SCADA (Supervisory Control and Data Acquisition), the operation of high side switches, power transformers, buswork and transfer switches, voltage regulators within the substation. Prerequisites: EDS 105 and EDS 235. 3 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. Prerequisite: Department Chair approval. 1-4 credit hours.



ELECTRONICS ENGINEERING TECHNOLOGY
GENERAL OPTION
BIOMEDICAL ENGINEERING TECHNOLOGY OPTION
15.0303
(Associate of Applied Science Degree)

Experts predict that the “new millennium” 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 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 enrolling in the Electronics Engineering Technology program have two degree options to choose from:

Electronics Engineering Technology General Option

The Electronics Engineering Technology 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. All students have the opportunity to become a certified electronics technician through the International Society of Certified Electronics Technicians, which gives them a career advantage. The Electronics Engineering Technology General Option is accredited by the Technology Accreditation Commission (TAC) of ABET and the Federal Aviation Administration’s Air Traffic Organization, Technical Operations, Collegiate Training Initiative.

Electronics Engineering Technology Biomedical Engineering Technology Option

The Electronics Engineering Technology Biomedical Engineering Technology Option provides students with an intensive, hands-on experience that concentrates on general biomedical equipment with an introduction to diagnostic imaging. All students will have the opportunity to become certified through the International Society of Certified Electronics Technicians. They will also be qualified to take the Association for the Advancement of Medical Instrumentation (AAMI) certification exam.

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:

- Assure that the student has the opportunity to demonstrate effective communication skills including teamwork and interpersonal skills.
- Assure that the student has the opportunity to demonstrate proper analysis and troubleshooting/problem solving techniques.
- Assure that the student has the opportunity to demonstrate the technical knowledge, understanding and rationale for all applied tasks associated with all major subject areas.
- Assure that the student has the opportunity to demonstrate the ability to research and utilize component data using specification sheets and reference manuals.
- Assure that the student has the opportunity to demonstrate skills in the repair or upgrade of advanced electronics systems.
- Assure that the student has the opportunity to demonstrate a professional attitude toward the emerging electronics industry including continuing education.

CORE CURRICULUM

			Credit Hours
EET	122	DC/AC Circuit Analysis w/Lab	6
EET	123	Semiconductor Devices and Analog Circuits w/Lab	8
EET	125	Digital Electronics w/Lab	4
EET	215	Microcomputer Hardware, Operation, Repair, and Interfacing w/Lab	4
EET	237	Electronic Telecommunications w/Lab	5
SUB-TOTAL			27

GENERAL EDUCATION REQUIREMENTS

		General Education Requirements (see pages 39 & 40)	19
		Must Include: MAT 122 Elements of Calculus	3
		PHY 201 General Physics	5
SUB-TOTAL			20

PROGRAM REQUIREMENTS

General Option			
EET	163	Software Development and Assembly Language Programming w/Lab	3
EET	210	Industrial Electronics w/Lab	5
EET	214	Programmable Controllers	3
EET	240	Computer Integrated Manufacturing w/Laboratory	3
COM	211	Technical Writing	3
MAT	120	Pre-Calculus	5
OR			
MAT	115	College Algebra	3
AND			
MAT	121	Trigonometry	3
SUB-TOTAL			22-23

OR

Biomedical Engineering Technology Option			
EET	105	Human Anatomy and Physiology as applied to Biomedical Instrumentation	3
EET	110	Medical Terminology	2
EET	133	Biomedical Instrumentation I	3

EET	222	Biomedical Instrumentation II	3
EET	225	Diagnostic Imaging	3
COM	211	Technical Writing	3
MAT	120	Pre-Calculus	5
OR			
MAT	115	College Algebra	3
AND			
MAT	121	Trigonometry	3
Optional:			
EET	170	Biomedical Engineering Technology Internship (Optional)	(4)
SUB-TOTAL			22-27
GRADUATION REQUIREMENT			
BUS	125	Job Search Strategies	1
SUB-TOTAL			1
PROGRAM TOTAL			70-75

EET 105 Human Anatomy and Physiology as applied to Biomedical Instrumentation. This course is an overview of the body systems, structures and functions. Emphasis is placed on the nervous, cardiovascular and respiratory systems. This course will introduce students to therapeutic and diagnostic biomedical instrumentation as it relates to the body systems. 3 credit hours.

EET 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. The course is designed to help the student acquire a working medical vocabulary to spell, use, and define medical terms. 2 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 semi-conductors); 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 122 DC/AC Circuit Analysis w/Lab. Topics include: elements of electrical physics, electrical conductors, resistors and insulators, application of Ohm's law, conversion of electrical units, resistor color code, power, energy, alternating current (AC) and direct current (DC), series-combination DC and AC circuits, voltage dividers, network theorems, voltage and current sources, magnetism and electromagnetism, meter movements and scales, generation of sinusoidal waveforms, vector analysis, capacitance, inductance, impedance, reactive circuits, RC circuits, RL circuits, RLC circuits, and electrical safety. The course includes a laboratory course designed to provide theory of experimentation and use of electronic instruments, electrical safety, soldering, and practical experience in basic measurement and meters. 6 credit hours.

EET 123 Semiconductor Devices and Analog Circuits w/Lab. The analysis and design of circuits utilizing both discrete and integrated circuit components, is then implemented into various system applications. Topics include: electronic conduction in conductors and semiconductors, the pn junction, diodes, diode circuits, special purpose diodes, optoelectronic devices, bipolar transistors, transistor fundamentals, transistor biasing, AC models, amplifiers, field effect transistors, FET circuits, thyristors, operational amplifiers, amplifier frequency effects, negative feedback, linear op-amp circuits, oscillators and regulated power supplies. Also includes laboratory experiences which include device testing, observation of characteristics, schematic tracing, circuit analysis and troubleshooting techniques. Prerequisite: EET 122. Corequisites: MAT 120 or MAT 115 and MAT 121. 8 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. 4 credit hours.

EET 133 Biomedical Instrumentation I. An introduction to sensors and electronic circuits used in biomedical equipment. Circuits covered are operational amplifiers, instrumentation amplifiers, filters, and other various signal processing circuits. Transducers and associated circuitry used to measure ECG, EEG, EMG, pH and other biopotentials will be covered in this course. This course includes laboratory work to reinforce topics covered in the lecture. Prerequisites: EET 105, EET 123, and EET 125. 3 credit hours.

EET 163 Software Development and Assembly Language Programming w/Lab. A comprehensive course covering problem definition and program design, flowcharting, modular programming, structured programming, debugging, documentation and testing of software developed for the Intel microprocessor-based computers. Assembly language programming skills are developed using editor/assembler software. Topics include: Intel instruction set, addressing modes, assembler conventions, character coded data, code conversions, arithmetic and logic functions, input/output routines and interrupt handling. 3 credit hours.

EET 170 Biomedical Engineering Technology Internship. The internship is an optional work experience in a biomedical facility under the supervision of an experienced biomedical engineering technician. The student will assist in the performance of safety inspections, preventive maintenance, repairs and calibration of various medical equipment. Prerequisites: EET 105. 4 credit hours.

EET 210 Industrial Electronics w/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, optical electronics control devices, temperature and humidity transducers, industrial process control applications and circuits, pulse modulation techniques, data acquisition, industrial telemetry and data communication, sequential process control and control logic and programmable controllers. Also includes a laboratory course with experiments designed to support this course. Prerequisites: EET 123 and EET 125. 5 credit hours.

EET 214 Programmable Controllers. Course includes the hardware configuration, I/O modules, memory organizations, and instruction sets of several different programmable controllers. Students study ladder logic and apply it to several industrial control applications. Prerequisite: EET 125. 3 credit hours.

EET 215 Microcomputer Hardware, Operation, Repair, and Interfacing. Topics include: microcomputer architecture, LSI support devices, DRAM subsystem, video display, floppy and hard disk subsystems, troubleshooting and repair, interfacing to the PC bus, serial interfacing, parallel interfacing, sensor interfacing, user input device interfacing. Also includes a laboratory course with experiments designed to support this course. Prerequisites: EET 123 and EET 125. 4 credit hours.

EET 222 Biomedical Instrumentation II. This course will instruct the student in the operation, diagnostics, preventive maintenance, and calibration of medical equipment. Various types of biomedical equipment will be demonstrated and/or used in the labs. Prerequisite: EET 133. 3 credit hours.

EET 225 Diagnostic Imaging. This course covers the theory of diagnostic imaging including x-ray, computer aided tomography, nuclear imaging and ultrasound. Components and safety of nuclear imaging systems are included. Safety aspects of x-ray are also taught. Prerequisites: EET 123 and EET 125. 3 credit hours.

EET 237 Electronic Telecommunications w/Lab. A course designed to study all the relevant aspects of communications systems. Topics include signals and their spectra, noise, amplitude, single side band, frequency, angle and pulse modulation, transmission and reception, communications techniques, digital and data communications, digital-to-analog and analog-to-digital conversions, radio telemetry, transmission lines, antennas, antenna wave propagation, LASER and fiber optic techniques and television theory. Also includes a laboratory course where digital and analog communications systems troubleshooting procedures are emphasized. Prerequisite: EET 123. Corequisite: MAT 122. 5 credit hours.

EET 240 Computer Integrated Manufacturing w/Lab. A comprehensive technical survey of the important topics in production automation and related systems. Topics include flow line production, numerical control, industrial robotics, material handling, group technology, flexible manufacturing systems, automated inspection, process control, and computer integrated manufacturing (CIM). Students design and model a CIM system. Skills in system design and layout, controller design, hardware interfacing, control and timing implementation, and software interfacing are developed. Prerequisites: EET 210 and EET 215. 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.



HEATING, VENTILATION, & AIR CONDITIONING TECHNOLOGY 47.0201

(Associate of Applied Science Degree)

The Heating, Ventilation, & Air Conditioning Technology program prepares students to install, service and repair refrigeration and air conditioning systems including geothermal ground source heat pumps. Graduates may be employed with small businesses in the selling and maintenance of residential systems.

Many job opportunities exist to install and maintain the refrigeration systems of modern supermarkets. Still other graduates may be employed in the maintenance of HVAC systems in buildings and factories. Small classes in basic 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. Students are required to join the Refrigeration Service Engineers Society (RSES), a nationally recognized educational certification agency. RSES training materials are used in the classroom, and students can become certified in four RSES areas if they pass the required examinations. Many contractors are RSES members and seek employees with certification.

The Heating, Ventilation, & Air Conditioning Technology program has three national accreditations: HVAC Excellence, the Partnership for Air Conditioning, Heating, Refrigeration Accreditation (PAHRA), and the National Association of Industrial Technology (NAIT).

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.

Program Mission

The mission of the Heating, Ventilation, & Air Conditioning Technology program is to prepare students to install, service and repair refrigeration and air conditioning systems.

Program Goals

The goals of the program are to:

- Ensure the student gains the skills needed for analytic and problem solving in the HVAC/R industry.
- Ensure the student gains knowledge in servicing and repairing heating, air conditioning, and refrigeration equipment
- Ensure the student demonstrates effective communication and interpersonal skills.
- Ensure the student has knowledge of safety standards as related to the HVAC/R field.

CORE CURRICULUM

			Credit Hours
HVT	151	Fundamentals of Refrigeration, Air Conditioning, and Introduction to Domestic Refrigeration	6
HVT	161	Electricity Fundamentals	5
HVT	152	Domestic and Commercial Refrigeration w/Lab	6
HVT	123	Electrical Wiring (Residential)	3

HVT	124	Electrical Wiring (Lab)	2
HVT	255	Internship (Fourteen-week)	8
HVT	251	Residential and Commercial Air Conditioning	6
HVT	261	Residential and Commercial Motors & Controls	3
HVT	270	Sheet Metal Lecture/Lab	2
HVT	252	Residential and Commercial Heating & A/C w/ Lab	6
HVT	262	System Diagnosis and Repair	3
		SUB-TOTAL	50

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
		SUB-TOTAL	19

PROGRAM REQUIREMENT

DDT	130	Practical Drafting for the HVAC Trades	3
		SUB-TOTAL	3

GRADUATION REQUIREMENT

SEM	105	Career Services Seminar	NC
		PROGRAM TOTAL	72

HVT 123 Electrical Wiring (Residential). This classroom proven course is updated to the latest National Electrical Code (NEC), and new materials are covered. Throughout the course the student is asked to draw wiring diagrams, make electrical calculations, refer to plan specifications and use the latest NEC. The student completes work sheets on wiring layout, room for room, topic by topic and will completely wire a typical single family residence. Prerequisite: HVT 161 with a grade of “C” or better. 3 credit hours.

HVT 124 Electrical Wiring (Lab). Hands-on shop course in residential wiring. Working with the National Electrical Code (NEC) book and learning manipulative skills in house wiring. This shop course supports lecture course HVT 123. Prerequisite: HVT 161 with a grade of “C” or better. 2 credit hours.

HVT 151 Fundamentals of Refrigeration, Air Conditioning and Introduction to Domestic Refrigeration. A lecture and demonstration/laboratory course covering theory 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 is taught. Basic instruction in the use of cleaning solvents, refrigeration oils and refrigerants. Principles of domestic refrigeration covering all components of household refrigerators. Students can earn certification from RSES, ARI and the EPA. 6 credit hours.

HVT 152 Domestic and Commercial Refrigeration w/Lab. Additional theory and practical applications. A lecture/demonstration/laboratory course including maintenance and service of evaporators, compressors, refrigerant control valves, electrical motors and controls, receivers and accessories. Load calculations are covered in detail. Students learn manipulative skills and procedures in the operation, maintenance, servicing, and sizing of the proper equipment. Theory and practical application of three phase motors and equipment. Prerequisites: HVT 151 and HVT 161 with a grade of “C” or better. 6 credit hours.

HVT 161 Electricity Fundamentals. Introductory lecture course which covers theory and application of Ohms Law. Covers resistance, capacitance, inductance, transformers, motors used for domestic applications, series, parallel circuits and other circuitry. 5 credit hours.

HVT 251 Residential and Commercial Air Conditioning. A lecture and demonstration/laboratory course covering all the common air cooling systems and components. Emphasis is placed upon developing the ability to install and service cooling systems, components and controls. Basic sheet metal processes, insulation selection and installation and the applications of nonmetal ducts. Methods used in sizing piping on air conditioning. Selection of equipment and its application. Prerequisites: HVT 151 and HVT 152 with a grade of "C" or better. 6 credit hours.

HVT 252 Residential and Commercial Heating and A/C w/Lab. A lecture and demonstration/laboratory course covering all types of heating system components. Oil, gas and electric furnaces are included with laboratory assignments designed to develop the manipulative skills and knowledge required to install, service and maintain the common central or room heating systems. The course is designed to develop a high degree of skill in the design, installation and service of commercial air conditioning systems, to develop skill in troubleshooting component parts on air conditioning applications and commercial refrigeration systems, with laboratory exercises, to develop skill in accountability of time and material spent on the job and to develop in the student proper habits including punctuality, dependability and customer relations. Prerequisite: HVT 251 with a grade of "C" or better. 6 credit hours.

HVT 255 Internship. Fourteen weeks of paid on-the-job training. Training is provided by skilled journeymen HVAC technicians under a training agreement. Prerequisites: HVT 151 and HVT 152 with a grade of "C" or better. 8 credit hours

HVT 261 Residential & Commercial Motors & Controls. Lecture and demonstration of motor and control use in air conditioning with emphasis on types, theory and application. Step by step procedures in troubleshooting motors, controls and testing air conditioning systems. Prerequisites: HVT 123 and HVT 161 with a grade of "C" or better. 3 credit hours.

HVT 262 Systems Diagnosis & Repair. Step by step procedures for starting new air conditioning systems. Troubleshooting system problems, servicing and testing air conditioning systems. Prerequisites: HVT 251 and HVT 261 with a grade of "C" or better. 3 credit hours.

HVT 270 Sheet Metal Lecture/Lab. A lecture and laboratory course designed to give the student specific instructions on job surveys, layout, fabrications, sizing and installation of sheet metal work in the air conditioning and heating 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.



HEAVY EQUIPMENT OPERATIONS
49.0202
(Eleven Month Certificate Program)

The Heavy Equipment Operations program is designed to produce operators trained in the major classification of earth moving equipment. Students receive extensive training in the operation of dozers, scrapers, wheel loaders, backhoes, excavators, graders, and skid steers. Classroom instruction includes units in a number of related subjects such as welding, grade operations, blueprint reading and preventive maintenance (fuel and lubricants). The Heavy Equipment Operations program is accredited by the National Center for Construction Education and Research (NCCER).

The college works with local agencies, high schools, and colleges in providing practical on-the-job experience when possible. Training, which begins in June, takes place on a 125-acre operation site. Graduates of the one-year (11 month) certificate program 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. The total instructional hours of the certificate program are 1350 hours of which 160 hours of instruction are in Class A Commercial Driver's License (CDL).

The applied curriculum is performed on both simulated and actual construction projects. The student will perform manual labor usually associated with these tasks (such as bolting pipe, shoveling, etc.). A course that prepares students for the Class A Commercial Driver's License (CDL) examination is included in the program. 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.

Students will complete an internship once they have successfully completed all course work, passed the exit exam, and obtained 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.

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.

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:

- Assure that procedures related to the operation of heavy equipment are followed in accordance with industry standards.
- Provide students with the technical competencies in the major classifications of earth moving equipment utilized at the college.
- Provide the students the opportunity to develop effective communication skills necessary to succeed in the industry.

CORE CURRICULUM

			Credit Hours
HEO	100	First Aid and Safety	1
HEO	102	Basics of Heavy Equipment Operation	1
HEO	105	Orientation to the Trade	1
HEO	106	Introduction to Heavy Equipment Operations	1
HEO	112	Applied Measurements In Construction	2
HEO	115	Welding	1
HEO	132	Soils	2
HEO	135	Advanced Safety	2
HEO	137	Finishing and Grading	2
HEO	139	Grade Operations	2
SUB-TOTAL			15

PROGRAM REQUIREMENTS

HEO	131	Heavy Equipment Operations Internship	3
HEO	146	Backhoe and Excavator	4
HEO	147	Dozer and Scraper	4
HEO	148	Loader	4
HEO	149	Motor Grader and Skid Steer	4
HEO	150	Commercial Driver's License	4
SUB-TOTAL			23

GENERAL EDUCATION REQUIREMENTS

CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			
COM	110	Honors Composition	
OR			
COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
SUB-TOTAL			6

GRADUATION REQUIREMENT

BUS	125	Job Search Strategies	1
SUB-TOTAL			1

PROGRAM TOTAL **45**

HEO 100 First Aid and Safety. 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.

HEO 102 Basics of Heavy Equipment Operation. This course is designed to give the student a basic understanding of basic tools and blueprints used in the construction trade. 1 credit hour.

HEO 105 Orientation to the Trade. This course introduces the Heavy Equipment Operations student to the different aspects and requirements for the heavy equipment operations trade as well as educating the student in the proper care and preventive maintenance of construction equipment. 1 credit hour.

HEO 106 Introduction to Heavy Equipment Operations. This course introduces the Heavy Equipment Operations student to the identification, use and description of basic operation of different types 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.

HEO 112 Applied Measurement in Construction. Practical mathematics taught with applications that apply to the horizontal construction industry. Reading engineers scale, conversions of decimals, fractions and percents, and basic calculations for earth work quantities. 2 credit hours.

HEO 115 Welding. Includes basic principles and fundamentals of arc welding and acetylene cutting as applied to heavy equipment repairs. Also covers basic welding and acetylene safety. 1 credit hour.

HEO 131 Heavy Equipment Operations Internship. 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. The instructor will determine the number of hours a student will participate in the internship. Prerequisite: Successfully completed all course work, passed the exit exam, and obtained the approval of their advisor. 3 credit hours.

HEO 132 Soils. This course provides classroom instruction on classification, compaction, and testing of soils. 2 credit hours.

HEO 135 Advanced Safety. This course is designed to identify safety hazards associated with working around heavy equipment and to establish procedures that will prevent accidents. Avoidance of actions that may result in damage to personnel or equipment is stressed. Emphasis is given to OSHA and NIOSH requirements, inspections, and reporting. This course also includes training in the notification of utilities before digging as well as safety reporting, inspections, and investigations. Prerequisite: HEO 100. 2 credit hours.

HEO 137 Finishing and Grading. This course describes the use of various types of heavy equipment to finish and trim grades and slopes of roads, pads, ditches, and other structures. Information is presented regarding the responsibilities and leadership abilities in relation to organizing and directing workers and operations. Students will understand and interpret production requirements and specifications used for grading. 2 credit hours.

HEO 139 Grade Operations. This course provides the student with details about the staking and grading operations of a 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. Prerequisites: HEO 105, HEO 106, HEO 132, and HEO 137. 2 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 and Scraper. This course introduces basic dozer and scraper operation and maintenance, identification of components, dozer and scraper safety, use of operators manual, daily servicing and operation of the machine to the point where the student can safely start the machine, move it, and shut it down. The student will operate both dozer and scraper to perform specific tasks. 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: Eligibility for Class A Commercial Driver's License (CDL) and successful drug screen. 4 credit hours.

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

GENERAL OPTION

47.0302

(Associate of Applied Science Degree)

The Heavy Equipment Technology program prepares individuals to perform maintenance, troubleshooting and overhaul 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, manual and power shift transmissions. Some equipment operation is included to familiarize students with the equipment they are learning to repair.

Graduates of the two-year Associate of Applied Science degree (AAS) 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. The program is also accredited by the National Association of Industrial Technology (NAIT).

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.

Students who graduate with an Associate of Applied Science degree in Heavy Equipment Technology may pursue a second Associate of Applied Science degree in Electric Power Generation Technology. A second Associate of Applied Science degree in Electric Power Generation Technology may be completed in two semesters if scheduling permits.

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 repair and maintain heavy equipment.
- Provide the opportunity for students to develop the knowledge and skills necessary to repair, maintain and troubleshoot diesel engines.
- Provide the opportunity for students to develop knowledge and skills necessary to repair, maintain and troubleshoot of hydraulic and drive train systems as they relate to heavy equipment.
- Provide an opportunity for students to develop and demonstrate critical thinking skills used in troubleshooting.
- Assure that students have the opportunity to develop oral and written communication skills needed in the diesel mechanic’s field.

CORE CURRICULUM

			Credit Hours
HET	140	Introduction to Equipment, Tracks, Tires and U/C	2
HET	141	Fluids and Filtration	3
HET	145	Engines I	3
HET	191	Internship I	8
HET	242	Electrical Systems I	3
HET	243	Electrical Systems II	3
HET	244	Hydraulics I	3
HET	245	Hydraulics II	3
HET	246	Power Train I	3
HET	247	Power Train II	3
HET	251	Job Estimating, Diagnosis and Field Repair	4
HET	255	Engines II	3
		SUB-TOTAL	41

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
May Not Include: MAT 116 College Algebra Using Mathematical Modeling			3
		SUB-TOTAL	19

PROGRAM REQUIREMENTS

MHT	280	Heating and Air Conditioning	3
MHT	180	Truck Welding	2
OR			
HET	250	Failure Analysis	3
OR			
MPT	165	Basic Welding	3
COM	211	Technical Writing	3
		SUB-TOTAL	8-9

GRADUATION REQUIREMENTS

BUS	125	Job Search Strategies	1
		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.

PROGRAM TOTAL **69-70**

First Aid and CPR will be included in the program.

HET 140 Introduction to Equipment Tracks, Tires and U/C. This course discusses various types of machinery. Introduction of preventive maintenance, proper starting procedure and operation. Also describes proper maintenance, adjustments and installation of undercarriage. 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 overhaul, inspection, repair and maintenance. 3 credit hours.

HET 191 Internship I. The Heavy Equipment Technology Internship I is comprised of 640 hours of paid work experience in a heavy equipment dealership requiring the student to perform a variety of tasks. The student will be required to work eight hours per day for sixteen weeks. A training agreement between the employer, the student and the college is required. The student will submit a weekly summary of activities (tasks performed). 8 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. 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. Prerequisite: HET 244. 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. Prerequisite: HET 246. 3 credit hours.

HET 250 Failure Analysis. This course describes in detail how to analyze parts and system failures. 3 credit hours.

HET 251 Job Estimating, Diagnosis and Field Repair. This course will enable you to estimate jobs, diagnose equipment and perform field repairs. 4 credit hours.

HET 255 Engines II. This course will concentrate on advanced engine systems including ignition starting, charging, and fuel with emphasis on multi-fuel components and electronic engine control. Instruction includes the use of the latest computerized test equipment utilized in engine diagnostics. Prerequisite: HET 145. 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.



CAT DEALER SERVICE TECHNICIAN OPTION
47.0302
(Associate of Applied Science Degree)

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 National Association of Industrial Technology (NAIT).

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 graduation requirement of the CAT Dealer Service Technician Option for students to earn a cumulative grade point average of 3.000 on a 4.000 point grading scale.

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 the knowledge and skills needed to repair, maintain, troubleshoot and diagnose Caterpillar equipment systems.
- Provide an opportunity for students to develop and demonstrate critical thinking skills used in troubleshooting and diagnostics.
- Assure that students have the opportunity to develop oral and written communication skills needed to succeed in the Caterpillar Dealer network.

CORE CURRICULUM

			Credit Hours
CAT	110	CAT Engine Fundamentals	4
CAT	111	Introduction to CAT Service Industry	2
CAT	150	Internship I	4
CAT	112	Fundamentals of Hydraulics	3
CAT	113	CAT Engine Fuel Systems	3
CAT	114	Fundamentals of Electrical Systems	3
CAT	151	Internship II	4
CAT	115	Air Conditioning	2
CAT	116	Fundamental Transmissions/Torque Converters	3
CAT	117	Machine Hydraulic Systems	3
CAT	250	Internship III	4
CAT	200	U/C and Final Drive	3
CAT	201	Machine Electronic Systems	3
CAT	251	Internship IV	4
CAT	202	CAT Engine Performance	2
CAT	203	Diagnostic Testing	2
CAT	204	Machine Specific Systems	4
SUB-TOTAL			53

GENERAL EDUCATION REQUIREMENTS

General Education Requirements			19
(see pages 39 & 40)			
May Not Include: MAT 116 College Algebra Using Mathematical Modeling			3
		OR	
		MAT 118 Survey of College Mathematics	3
		SUB-TOTAL	19
		PROGRAM REQUIREMENT	
WLD	120	CAT Welding	2
		SUB-TOTAL	2
		GRADUATION REQUIREMENTS	
BUS	125	Job Search Strategies	1
		SUB-TOTAL	1
		It is a graduation requirement of the CAT Dealer Service Technician Option for students to earn a cumulative grade point average of 3.000 on a 4.000 point grading scale.	
		PROGRAM TOTAL	75

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
46.0302
(Associate of Applied Science Degree)

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 craft occupations and offers relatively high earnings. Students who graduate from the program at Linn State Technical College can expect to have the knowledge necessary to pass the licensing examination, which is required for employment in many localities.

The Industrial Electricity program at Linn State Technical College provides extensive hands-on practical training in small classes taught by teachers who have worked in the electrical field. Students in this program receive extensive training in programmable logic controllers (PLC's), which is the field's fastest growing and most in-demand skill. The Industrial Electricity program is accredited by the National Association of Industrial Technology (NAIT).

Courses in electricity, electronics, blueprint reading, science and general studies develop the competencies of both construction and maintenance electricians. All students become CPR certified, and safety and electrical code requirements are stressed in all classes.

The Industrial Electricity program offers an Associate of Applied Science degree in construction, electronic controls, or programmable logic controllers. Also offered is an electromechanical certificate. These three program emphases and the certificate option allow students the flexibility to choose the electrical field that best suits their individual career goals. The curriculum provides the hands-on skills and knowledge required for entry-level employment. Employment opportunities may be found in schools, hospitals, manufacturing, and building complexes, or residential, commercial, and industrial construction.

Students who graduate with an Associate of Applied Science degree in Industrial Electricity may pursue a second Associate of Applied Science degree in Electric Power Generation Technology. The Industrial Electricity internship is required for those students who wish to obtain a second degree in Electric Power Generation Technology. A second Associate of Applied Science degree in Electric Power Generation Technology may be completed in one to two semesters if scheduling permits.

Program Mission

The mission of the Industrial Electricity program is to enhance technical and economic development in the state by providing to Missouri's growing industries; quality technicians, technical training, consultation, and research in the industrial electricity area and to provide advanced specialized technical education in both conventional and emerging technologies that maximizes the potential of each student for meaningful employment and progress in their chosen field.

Program Goals

The goals of the program are to:

- Assure that students develop the manual and critical thinking skills required to design, install, and repair electronic and electromechanical systems, in commercial and industrial settings.
- Teach and model attitudes, ethics, and communication skills, that enhance students' ability to secure and maintain increasingly meaningful employment in their chosen fields.
- Assure students' increasing awareness of potential hazards and of safety practices required to prevent injuries and material damage.

CORE CURRICULUM

			Credit Hours
IEL	115	Basic Motor Controls	3
IEL	211	Transformers	2
IEL	260	Motors	2
IEL	208	Integrated Mechanical Systems	3
IEL	217	Advanced Motor Controls	3
IEL	257	Power Distribution	2
IEL	221	Frequency Drives	3
SUB-TOTAL			18

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
		Must Include: PHY 101/102 College Physics	4
SUB-TOTAL			19

PROGRAM REQUIREMENTS

Construction Emphasis			
IEL	102	Safety and Accident Prevention	2
IEL	117	Circuitry Fundamentals w/Lab	4
IEL	201	Industrial Wiring I	4
IEL	128	National Electrical Code (NEC)	3
IEL	106	Electrical Blueprint Reading	2
IEL	122	Power Regulation	2
IEL	230	Industrial Electricity Internship I	4
OR			
IEL	251	Industrial Wiring II	
MPT	165	Basic Welding	3
EMS	120	Trigonometry for Industrial Electricity	3
OR			
MAT	121	Trigonometry	
COM	211	Technical Writing	3
OR			
COM	201	Occupational Communication	
SUB-TOTAL			30

OR

Electronic Controls Emphasis			
EET	122	DC/AC Circuit Analysis w/Lab	6
EET	163	Software Development and Assembly Language Programming w/Lab	3
EET	123	Semiconductor Devices and Analog Circuits w/Lab	8
EET	125	Digital Electronics w/Lab	4
IEL	255	Basic Programmable Logic Controllers	4
IEL	275	Advanced Programmable Logic Controllers	4
COM	211	Technical Writing	3
OR			
COM	201	Occupational Communication	

SUB-TOTAL 32

OR

Programmable Logic Controllers Emphasis

IEL	102	Safety and Accident Prevention	2
IEL	117	Circuitry Fundamentals w/Lab	4
IEL	201	Industrial Wiring I	4
IEL	128	National Electrical Code (NEC)	3
IEL	106	Electrical Blueprint Reading	2
IEL	122	Power Regulation	2
IEL	255	Basic Programmable Logic Controllers	4
IEL	275	Advanced Programmable Logic Controllers	4
EMS	120	Trigonometry for Industrial Electricity	3
OR			
MAT	121	Trigonometry	
COM	211	Technical Writing	3
OR			
COM	201	Occupational Communication	
		SUB-TOTAL	31

GRADUATION REQUIREMENT

BUS	125	Job Search Strategies	1
		SUB-TOTAL	1

PROGRAM TOTAL 68-70

INDUSTRIAL ELECTRICITY

Electromechanical

46.0302

(One-Year Certificate)

CORE CURRICULUM

			Credit Hours
IEL	102	Safety and Accident Prevention	2
IEL	106	Electrical Blueprint Reading	2
IEL	117	Circuitry Fundamentals w/Lab	4
IEL	115	Basic Motor Controls	3
IEL	217	Advanced Motor Controls	3
IEL	201	Industrial Wiring I	4
OR			
IEL	255	Basic Programmable Logic Controllers	
IEL	128	National Electrical Code (NEC)	3
IEL	208	Integrated Mechanical Systems	3
		SUB-TOTAL	24

GENERAL EDUCATION REQUIREMENTS

CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			

COM	110	Honors Composition	
OR			
COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
		SUB-TOTAL	6
		PROGRAM REQUIREMENT	
MPT	165	Basic Welding	3
		SUB-TOTAL	3
		GRADUATION REQUIREMENT	
BUS	125	Job Search Strategies	1
		SUB-TOTAL	1
		PROGRAM TOTAL	34

IEL 102 Safety and Accident Prevention. This course teaches the hazards associated with industrial electricity, electric power generation, safety rules and safe work practices, OSHA rules and regulations associated with this industry, and the reporting procedures and the penalties that pertain to these regulations. 2 credit hours.

IEL 106 Electrical Blueprint Reading. A course designed to develop the students' ability to understand all the major aspects of interpreting electrical blueprints. The fundamentals of electrical wiring schematics and diagrams are covered. 2 credit hours.

IEL 115 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. Corequisite: IEL 117 or EET 122. 3 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 Power Regulation. This course explores the power distribution system on the supply side and the effects of various reactive and solid state devices on new and existing electrical installations on the consumer side. It includes supplier power quality maintenance strategies, power factor adjustments and the identification and correction of harmonics problems. Additionally, this course teaches the basic theory and operation of voltage regulators as applicable to electric power generation. Emphasis will be placed on synchronizing, paralleling, peak shaving and cogeneration. Switchgear will be taught as well as low and medium voltage systems and transfer systems. 2 credit hours.

IEL 128 National Electrical Code. This course provides an overview of the National Electrical Code. It includes instruction in the use and application of the various tables and appendixes included in the code. 3 credit hours.

IEL 201 Industrial Wiring I. This course covers the knowledge and skills necessary in industrial wiring. Topics include load calculations, wire sizing, transformer connections and conduit sizing and bending of rigid conduit. Prerequisite: IEL 115. 4 credit hours.

IEL 208 Integrated Mechanical Systems. This course includes the calculation and design of mechanical, hydraulic, pneumatic systems and their interfaces. Students will also design a conveyor system that includes roller diameter, gear drive ratio and horsepower. 3 credit hours.

IEL 211 Transformers. This course develops the concepts introduced in IEL 115 and IEL 117 as related to the theory and operation of transformers. Prerequisite: IEL 115. 2 credit hours.

IEL 217 Advanced Motor Controls. This course builds on the schematic and ladder logic concepts previously learned and applies them to the manufacturing process. Students are re-acquainted with

programmable logic basics towards the end of the class and continue to build on them, which will better prepare them for PLC courses. Prerequisite: IEL 115. 3 credit hours.

IEL 221 Frequency Drives. This course explains and applies frequency drive systems such as soft starts, DC and AC drives, braking and regeneration. Prerequisite: IEL 217. 3 credit hours.

IEL 230 Industrial Electricity Internship I. This internship is comprised of 320 hours of paid 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. 4 credit hours.

IEL 251 Industrial Wiring II. This course is a continuation of course IEL 201 (Industrial Wiring I). Students perform jobs around the campus that will be seen in real life situations. Students will be required to fill out work orders to account for time and materials. Prerequisite: IEL 201. 4 credit hours.

IEL 255 Basic Programmable Logic Controllers. This course requires students to design and apply programmable controls systems to industrial processes. Allen Bradley, Gould/Modicon and other systems are used and programmed. Prerequisite: IEL 217. 4 credit hours.

IEL 257 Power Distribution. This is a course in electrical system design which includes sizing, ordering and the interface of industrial transformers, load centers, switch gear and other electrical equipment. 2 credit hours.

IEL 260 Motors. This course develops the concepts introduced in IEL 115 and IEL 117 as related to the theory and operation of motors. Prerequisite: IEL 115. 2 credit hours.

IEL 272 Topics in Electrical System Design. This course is an independent study course designed to develop and enhance the special interests of advanced students. Projects and topics will be individualized and will include research, application of theory and design of electrical and electro-mechanical systems. Subject matter and credit granted for this course must be prearranged with the instructor and approved by the Department Chairperson. Credit granted for this course ranges between 3 and 6 credit hours. Prerequisite: Permission of instructor. 3-6 credit hours.

IEL 275 Advanced Programmable Controllers. This advanced course requires students to design and apply programmable control systems of increased complexity. Process and motion control applications are included. Allen Bradley, Gould/Modicon and other systems are used and programmed. Prerequisite: IEL 255. 4 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.



MACHINE TOOL TECHNOLOGY
48.0501
(Associate of Applied Science Degree)

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 a 5-Axis machining center, 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. The precision machining capstone projects help to prepare students for a challenging career in this high demand field. With your degree, you can choose careers including machining, CNC programming, mold/die making, quality control, or machine tool manufacturing.

The Machine Tool Technology program is certified with the National Institute for Metalworking Skills (NIMS) and accredited by the National Association of Industrial Technology (NAIT).

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

Program Mission

The mission of the Machine Tool Technology program is to prepare students, from the diverse population of Missouri, with the skills, knowledge, and attributes required for the completion of an Associate of Applied Science degree in the Machine Tool Technology field.

Program Goals

The goals of the program are to:

- Provide the students with instruction in the technical skills and knowledge needed to transform ideas and drawings into precision machined parts.
- Provide instruction in machining skills by manual and computer operated machine tools.
- Provide instruction in math to compute the needed formulas required for accurate set up, location, feeds, speeds, and coordinates to produce required parts.
- Provide the student with the opportunity to develop effective communications and interpersonal skills.

CORE CURRICULUM

			Credit Hours
MTT	100	Precision Machining Practices I	6
MTT	110	Precision Machining Practices II	3
MTT	120	CNC Programming – Milling	3
MTT	200	Grinding Technology	3
MTT	210	Fundamentals of CAD/CAM	3
MTT	220	CNC Programming – Turning and Wire EDM	3
MTT	230	Advanced CAD/CAM	3

MTT	240	Solid Modeling Essentials	3
MTT	290	Precision Machining Capstone Course	3
Optional:			
MTT	190	Machine Tool Technology Internship (Optional)	(4)
SUB-TOTAL			30-34

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
	Must Include: PHY 101/102 College Physics		4
SUB-TOTAL			19

PROGRAM REQUIREMENTS

DDT	135	Introductory Drafting Fundamentals	3
EMS	112	Trigonometry for Machine Tool	3
MPT	165	Basic Welding	3
EMS	113	Industrial Science	3
EMS	101	Statistical Process Control	1
SUB-TOTAL			13

GRADUATION REQUIREMENT

BUS	125	Job Search Strategies	1
SUB-TOTAL			1

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

PROGRAM TOTAL 63-67

MTT 100 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. 6 credit hours.

MTT 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: MTT 100 with a grade of “C” or higher. 3 credit hours.

MTT 120 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: MTT 100 with a grade of “C” or higher. 3 credit hours.

MTT 190 Machine Tool Technology Internship. The Machine Tool Technology Internship is a planned work experience comprised of 320 hours of paid on-the-job training in a machining related field requiring the student to perform a variety of tasks. The student will be required to work eight hours per day for eight weeks. A training agreement between the employer, the student and the college is required. The student will submit a weekly summary of activities (tasks performed). Note: Elective courses may be substituted for internship courses at the discretion or approval of the department. Prerequisites: MTT 110 and MTT 120 with a grade of “C” or higher and as stated in the Internship Handbook. 4 credit hours.

MTT 195 Automotive Machining Essentials. This course will cover the knowledge and skills used to recondition internal combustion engines and related components. Emphasis is placed on machining equipment, special tools, precision measuring tools and procedures used by the automotive machinist. 3 credit hours.

MTT 200 Grinding Technology. This course builds upon previous coursework. It includes grinding wheel construction, abrasives, set-up and procedures required to produce the surface finishes and close tolerances needed in industry. Skills and knowledge are developed through lecture and laboratory assignments. Prerequisite: MTT 110 with a grade of “C” or higher. 3 credit hours.

MTT 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: MTT 120 with a grade of “C” or higher. 3 credit hours.

MTT 220 CNC Programming - Turning and Wire EDM. This is an advanced computer numerical control (CNC) G-code programming class for the CNC lathe and wire electrical discharge machine (EDM). Through laboratory assignments, students apply programming techniques and operate CNC equipment to produce machined projects. Prerequisite: MTT 120 with a grade of “C” or higher. 3 credit hours.

MTT 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: MTT 210 with a grade of “C” or higher. 3 credit hours.

MTT 240 Solid Modeling Essentials. 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.

MTT 290 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. Prerequisite: MTT 200, 210 and MTT 220 with a grade of “C” or higher. 3 credit hours.

MTT 299 Special Topics in Machine Tool Technology. Special Topics in Machine Tool Technology (MTT) may include instruction on topics not covered in other MTT courses. Topics covered in other MTT 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.



MEDIUM/HEAVY TRUCK TECHNOLOGY
47.0613
(Associate of Applied Science Degree)

The Associate of Applied Science degree (AAS) 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 National Association of Industrial Technology (NAIT).

Graduates of the program can expect to find employment in the service department of trucking companies, independent garages, automobile dealerships and construction companies. They can also expect to earn high wages after reaching the level of a skilled technician. Beginning apprentices usually earn from 50 to 70 percent of the rate of a skilled worker.

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 Requirement” courses.

Students who graduate with an Associate of Applied Science degree in Medium/Heavy Truck Technology may pursue a second Associate of Applied Science degree in Electric Power Generation Technology. A second Associate of Applied Science degree in Electric Power Generation Technology may be completed in two semesters if scheduling permits.

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 repair and maintain heavy equipment.
- Provide the opportunity for students to develop the knowledge and skills necessary to repair, maintain and troubleshoot diesel engines.
- Provide the opportunity for students to develop knowledge and skills necessary to repair, maintain and troubleshoot of hydraulic and drive train systems as they relate to heavy equipment.
- Provide an opportunity for students to develop and demonstrate critical thinking skills used in troubleshooting.
- Assure that students have the opportunity to develop oral and written communication skills needed in the diesel mechanic’s field.

CORE CURRICULUM

			Credit Hours
MHT	102	Internship	8
MHT	130	Electrical and Electronic Systems	3
MHT	145	Engines I	3
MHT	160	Preventative Maintenance Inspection	3
MHT	170	Electrical and Electronic Systems II	3
MHT	180	Truck Welding	2
OR			
MPT	165	Basic Welding	3
MHT	200	Suspension and Steering	3
MHT	210	Brakes	3

MHT	220	Job Estimating, Diagnostics, Field Repair	5
MHT	240	Drive Train	3
MHT	255	Engines II	3
MHT	280	Heating and Air Conditioning	3
MHT	290	Basic Truck/Automotive Shop Management	3
Optional:			
MHT	260	Commercial Drivers License (Optional)	(1)
		SUB-TOTAL	45-47

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
May Not Include: MAT 116 College Algebra Using Mathematical Modeling			3
		SUB-TOTAL	19

PROGRAM REQUIREMENT

HET	244	Hydraulics I	3
		SUB-TOTAL	3

GRADUATION REQUIREMENTS

BUS	125	Job Search Strategies	1
		SUB-TOTAL	1

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 Requirement” courses.

PROGRAM TOTAL 68-70

First Aid and CPR will be included in the program.

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. 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 overhaul, inspection, repair and maintenance. 3 credit hours.

MHT 160 Preventative 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 causes and correct the malfunction of electronic circuits. Prerequisite: MHT 130. 3 credit hours.

MHT 180 Truck Welding. Basic principles and fundamental operations of arc welding, Mig, acetylene welding and cutting. 2 credit hours.

MHT 200 Suspension and Steering. A study of various types of steering systems and the advantages of each. Operating principles, testing and repair of power steering and wheel balancing and alignment are discussed and practiced. 3 credit hours.

MHT 210 Brakes. Covers braking systems used in tractors and trailers. Diagnosis and troubleshooting of the air and hydraulic systems. Adjustments to service and repair brakes will be performed. 3 credit hours.

MHT 220 Job Estimating, Diagnostics, Field Repair. This course will enable you to estimate jobs, diagnose equipment and perform field repairs. 5 credit hours.

MHT 240 Drive Train. Principles of operation and repairs of the truck transmission and differentials. Single and twin disc clutches are also discussed. 3 credit hours.

MHT 255 Engines II. This course will concentrate on advanced engine systems including ignition starting, charging, and fuel with emphasis on multi-fuel components and electronic engine control. Instruction includes the use of the latest computerized test equipment utilized in engine diagnostics. Prerequisite: MHT 145 or Corequisite: AMT 145. 3 credit hours.

MHT 260 Commercial Drivers License (CDL). This course provides classroom instruction and truck driving experience intended to enable the student to obtain a Class A Commercial Driver's License. Prerequisite: CDL Permit. 1 credit hour.

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.



NETWORKING SYSTEMS TECHNOLOGY

GENERAL OPTION

TELECOMMUNICATIONS OPTION

11.0901

(Associate of Applied Science Degree)

The Networking Systems Technology program is certified as a Cisco Certified Network Associate (CCNA) Local Academy, Cisco Certified Network Professional (CCNP) Local Academy, Fundamentals of Network Security (FNS) Local Academy and a CCNA Regional Academy. The Networking Systems Technology program is accredited by the National Association of Industrial Technology (NAIT). Both options include the Cisco certified course "Fundamentals of Voice and Data Cabling". The Telecommunications Option also includes The Fiber Optic Association (FOA) certified course "Fiber Optic Technology".

The degree program offers two tracks, which include the CCNA track or CCNP track. Entrance into a particular track is dependent upon previous training and certification. The CCNA track is for those students who have not taken or did not successfully complete Cisco semesters 1 through 4. Those students who have already achieved their CCNA or have successfully completed semesters 1 through 4 of the Cisco curriculum will be able to take the CCNP track. A student is required to take 4 semesters of Cisco courses at Linn State Technical College for graduation. This can be any combination of the CCNA & CCNP courses as long as prerequisites have been met.

The degree program also has two options both of which include Cisco instruction as described above. The first option is the General Option. The curriculum of the General Option focuses on networking from an industry perspective. The world continues to operate in the age of information technology. The demands on current network infrastructures require a network savvy workforce -- a workforce that can design or redesign networks and deploy new technologies while maintaining system up time with data and network security. A successful network technician must have a solid foundation of local area networking (LAN), wide area networking (WAN), computer hardware repair and installation, and computer software trouble shooting and installation skills in order to keep up with rapidly changing technologies.

The second option is the Telecommunications Option that prepares students for employment in the rapidly growing field of telecommunications. The telecommunications technician's role is to provide customers with voice and data services through a variety of delivery systems. This includes telecommunication network switching; Voice Over Internet Protocol (VoIP); microwave, wireless, and satellite equipment installation and repair; fiber optics and customer premises wiring; and many other facets of this fast-paced industry.

A graduate of the Networking Systems Technology program will have the skills to work in areas such as LAN/WAN network, System Administration or Telecommunications.

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. Students in both options are also required to pass one industry certification prior to graduation. Exam choices are specific to the curriculum and must be approved by the chair. The student is responsible for all certification exam fees.

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 telecommunications.

Program Goals

The goals of the program are to assure that the student:

- Has the opportunity to demonstrate oral and written communication skills.
- Has the opportunity to demonstrate analytical approaches to problem solving.
- Is provided an environment that allows the opportunity to demonstrate network administrator skills in business, government and/or in education.
- Is provided an environment that allows the opportunity to demonstrate project management skills.
- Is given the opportunity to demonstrate advanced network administrator skills or to plan, install and test the implementation and/or upgrade of telecommunications systems.

CORE CURRICULUM

			Credit Hours
NST	103	Fundamentals of Voice and Data Cabling	3
NST	105	System Maintenance	3
NST	180	Networking Internship I	4
OR			
NST	190	Telephony Internship I	4
NST	185	Networking Internship II	4
OR			
NST	195	Telephony Internship II	3
OR			
NST	Elective	Networking Systems Technology Approved Elective	3
NST	295	Networking Systems Capstone Project	3
Optional:			
NST	197	Networking Internship III (Optional)	(4)
NST	207	Networking Internship IV (Optional)	(4)
		SUB-TOTAL	16-25

AND

		CCNA Track	
NST	101	Network Fundamentals	3
NST	121	Routing Protocols and Concepts	3
NST	202	Local Area Network (LAN) Switching and Wireless	3
NST	219	Accessing the Wide Area Network (WAN)	3
		SUB-TOTAL	12

OR if CCNA Track is completed

		CCNP Track	
NST	225	Building Scalable Internetworks	3
NST	226	Building Multilayer Switched Networks	3
NST	227	Implementing Secure Converged Wide Area Networks (WAN)	3
NST	228	Optimizing Converged Networks	3
		SUB-TOTAL	12

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)			19
	Must Include: PHY 101/102 College Physics		4
	SUB-TOTAL		19

PROGRAM REQUIREMENTS

		General Option	
NST	115	Operating Platforms	3
NST	205	Linux Administration and Installation	3
NST	210	Microsoft Network Administration	3
NST	292	Fundamentals of Network Security	6
NST/	Elective	Networking Systems Technology/Computer	3
CPP		Programming Approved Elective	
COM	211	Technical Writing	3
		SUB-TOTAL	21

OR

		Telecommunications Option	
NST	114	Telecommunications Convergence Technologies	3
NST	123	Telecommunications Concepts	3
NST	235	Fiber Optic Technology	3
NST	267	Advanced Customer Provided Equipment (CPE) Installation & Repair (I/R)	3
NST	271	Digital Switching I	3
NST	280	T1 Networking I	3
NST	285	T1 Networking II	3
		SUB-TOTAL	21

GRADUATION REQUIREMENTS

BUS	125	Job Search Strategies	1
		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 69-78

NETWORKING SYSTEMS TECHNOLOGY

11.0901

(One-Year Certificate)

CORE CURRICULUM

			Credit Hours
NST	101	Network Fundamentals	3
NST	103	Fundamentals of Voice and Data Cabling	3
NST	105	System Maintenance	3
NST	115	Operating Platforms	3
		SUB-TOTAL	12

GENERAL EDUCATION REQUIREMENTS

CPP	101	Introduction to Microcomputer Usage	3
OR			
CPP	102	Advanced Microcomputer Usage	
AND			
COM	101	English Composition	3
OR			

COM	110	Honors Composition	
OR			
COM	111	Oral Communications	
OR			
COM	121	Public Speaking	
		SUB-TOTAL	6

PROGRAM REQUIREMENTS

NST	Elective	Networking Systems Technology Elective	3
NST	Elective	Networking Systems Technology Elective	3
NST	Elective	Networking Systems Technology Elective	3
CPP	Elective	Computer Programming Elective	3
MAT	070	Intermediate Algebra w/Lab	3
		SUB-TOTAL	15

GRADUATION REQUIREMENTS

BUS	125	Job Search Strategies	1
		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 34

NST 101 Network Fundamentals. This is the first of four courses designed to provide students with the skills needed to succeed in networking-related degree programs and helps prepare the student for Cisco Certified Network Associate (CCNA) certification. The students develop the skills necessary to fulfill the job responsibilities of network technicians, administrators, and engineers. This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. It uses the Open Standards Industry (OSI) and Transport Control Protocol (TCP) layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. 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 curriculum. Labs use a “model Internet” to allow students to analyze real data without affecting production networks. Packet Tracer (PT) activities help students analyze protocol and network operation and build small networks in a simulated environment. At the end of the course, students build simple Local Area Network (LAN) topologies by applying basic principles of cabling; performing basic configurations of network devices, including routers and switches; and implementing IP addressing schemes. Particular emphasis is given to the use of decision-making and problem-solving techniques in applying science, mathematics, communication and social studies concepts to solve networking problems. In addition, instruction and training are provided in the proper care, maintenance and use of networking software, tools and equipment and local, state and federal safety, building and environmental codes and regulations. 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 114 Telecommunications Convergence Technologies. This course will introduce the student to the realm of data and alternate communications media. Included are the areas of Internet, Voice Over IP, Satellite, and Fiber Optics. This course will show the convergence of telecommunications and networking. 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 121 Routing Protocols and Concepts. This Cisco Certified Network Associate (CCNA) course describes the architecture, components, and operation of routers, and explains the principles of routing and routing protocols. Students analyze, configure, verify, and troubleshoot the primary routing protocols Routing Information Protocol (RIPv1), Routing Information Protocol (RIPv2), Enhanced Interior Gateway Routing Protocol (EIGRP), and Open Shortest Path First (OSPF). By the end of this course, students will be able to recognize and correct common routing issues and problems. Each chapter walks the student through a basic procedural lab, and then presents basic configuration, implementation, and troubleshooting labs. Packet Tracer (PT) activities reinforce new concepts, and allow students to model and analyze routing processes that may be difficult to visualize or understand. Prerequisite: NST 101 with a grade of "C" or better. 3 credit hours.

NST 123 Telecommunications Concepts. This course covers the history of telecommunications, regulatory events, principles of traffic engineering, services available, and factors to be considered in obtaining a new telephone system/new technology. 3 credit hours.

NST 180 Networking 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 Networking 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 190 Telephony Internship I. The Telephony Internship is comprised of 320 hours of paid work experience in a telecommunications setting requiring the student to perform a variety of tasks. The student will be required to work eight hours per day for eight weeks. 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: Chair approval. 4 credit hours.

NST 195 Telephony Internship II. This Telephony Internship is comprised of 240 hours of work experience in a telecommunications setting requiring the student to perform a variety of tasks. The student will be required to work eight hours per day for six weeks. 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: Chair approval. 3 credit hours.

NST 197 Networking 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 202 Local Area Network (LAN) Switching and Wireless. This Cisco Certified Network Associate (CCNA) course helps students develop an in-depth understanding of how switches operate and are implemented in the LAN environment for small and large networks. Beginning with a foundational overview of Ethernet, this course provides detailed explanations of LAN switch operation, Virtual Local Area Network (VLAN) implementation, Rapid Spanning Tree Protocol (RSTP), VLAN Trunking Protocol (VTP), Inter-VLAN routing, and wireless network operations. Students analyze, configure, verify, and troubleshoot VLANs, RSTP, VTP, and wireless networks. Campus network design and Layer 3 switching concepts are introduced. 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 Networking 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 2000 Server with Active Directory. Emphasis is placed on installation, configuration and implementation of a functional 2000 Server. 3 credit hours.

NST 219 Accessing the Wide Area Network (WAN). This Cisco Certified Network Associate (CCNA) course explains the principles of traffic control and access control lists (ACLs) and provides an overview of the services and protocols at the data link layer for wide-area access. Students learn about user access technologies and devices and discover how to implement and configure Point-to-Point Protocol (PPP), Point-to-Point Protocol over Ethernet (PPPoE), DSL, and Frame Relay. WAN security concepts, tunneling, and VPN basics are introduced. The course concludes with a discussion of the special network services required by converged applications and an Introduction to Quality of Service (QoS). Prerequisite: NST 101 with a grade of “C” or better. 3 credit hours.

NST 225 Building Scalable Internetworks. Building Scalable Internetworks is the first of four courses leading to the Cisco Certified Network Professional (CCNP) designation. Building Scalable Internetworks introduces Cisco Networking Academy Program students to scalable IP networks. Students will learn how to create an efficient and expandable enterprise network by installing, configuring, monitoring, and troubleshooting network infrastructure equipment (especially routers such as Cisco Integrated Service Routers (ISRs)). According to the Campus Infrastructure module in the Enterprise Composite Network model. Topics include how to configure Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF), Intermediary System to Intermediary System (IS-IS), and Border Gateway Protocol (BGP) routing protocols and how to manipulate and optimize routing updates between these routing protocols. Other topics include multicast routing, Internet Protocol version 6 (IPv6) and Dynamic Host Control Protocol (DHCP) configuration. Prerequisites: NST 101, NST 121, NST 202, and NST 219 with a grade of “C” or better. 3 credit hours.

NST 226 Building Multilayer Switched Networks. Building Multilayer Switched Networks is one of four courses leading to the Cisco Certified Network Professional (CCNP) designation. Multilayer Switching teaches students about the deployment of state-of-the-art campus LANs. The course focuses on the selection and implementation of the appropriate Cisco IOS services to build reliable, scalable multilayer-switched LANs. Students will develop skills in the following areas: Introduction to Campus Networks, Virtual Local Area Networks (VLANs), Spanning Tree Protocol, Inter-VLAN Routing, high availability in a campus environment, wireless client access, minimizing service loss and data theft in a campus network, configuring campus switches to support voice. Prerequisites: NST 101, NST 121, NST 202, and NST 219 with a grade of “C” or better. 3 credit hours.

NST 227 Implementing Secure Converged Wide Area Networks (WAN). Implementing Secure Converged Wide Area Networks is one of four courses leading to the Cisco Certified Network Professional (CCNP) designation. Implementing Secure Converged Wide Area Networks introduces Cisco Networking Academy Program students to providing secure enterprise-class network service for teleworkers and branch sites. Students will learn how to secure and expand the reach of an enterprise network with focus on Virtual Private Network (VPN) configuration and securing network access. Topics include teleworker configuration and access, frame-mode Multiprotocol Label Switching (MPLS), site-to-site Internet Protocol Security (IPSEC) VPN, Cisco Easy VPN (EZVPN), strategies used to mitigate network attacks, Cisco device hardening and IOS firewall features. Prerequisites: NST 101, NST 121, NST 202, and NST 219 with a grade of “C” or better. 3 credit hours.

NST 228 Optimizing Converged Networks. Optimizing Converged Networks is one of four courses leading to the Cisco Certified Network Professional (CCNP) designation. Optimizing Converged networks introduces Cisco Networking Academy Program students to optimizing and providing effective Quality of Service (QoS) techniques in converged networks operating voice, wireless and security applications. Topics include implementing a VOIP network, implementing QoS on converged networks, specific IP QoS mechanisms for implementing the DiffServ QoS model, AutoQoS wireless security and basic wireless management. Prerequisites: NST 101, NST 121, NST 202, and NST 219 with a grade of “C” or better. 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 267 Advanced Customer Provided Equipment (CPE) Installation & Repair (I/R). In this course the student will learn to install and test advanced Customer Premise Equipment (CPE). Students will be exposed to wireless data communications. Investigation into fiber optics will highlight this course, culminating in a final project incorporating copper and fiber telecommunication equipment. Prerequisite: NST 103. 3 credit hours.

NST 271 Digital Switching I. The lecture portion of this course will cover the basic hardware components, the software system and the applications and capabilities of a digital switch. The hands-on portion will allow the students to log on, execute commands used to administer lines and trunks as well as perform maintenance on the machine. Prerequisite: NST 105. 3 credit hours.

NST 280 T1 Networking I. Digital carrier theory and operations will be taught in this course and will include carrier transmission, signaling, and power requirements. Also covered will be T1 facilities and the appropriate test procedure for these systems. Discussion will also include D4 type channel banks. 3 credit hours.

NST 285 T1 Networking II. This course will cover advanced theories and practical applications of installing, testing, and trouble shooting various multiplexers, including D4, SLC-96, and Fiber Light Wave. Prerequisite: NST 280. 3 credit hours.

NST 292 Fundamentals of Network Security. This course provides an introduction to popular network security tools and practices such as IPSec, CiscoSecure, PIX Firewalls and fundamentals of firewalls, intrusion detection tools, vulnerability scanning and access control in a hands on environment. Prerequisite: NST 202. 6 credit hours.

NST 295 Networking Systems Capstone Project. The Networking Systems Capstone Project enables students to demonstrate program practical application and theory in a real world scenario. This is accomplished by setting up a local and wide area network for voice, video and data over Internet connectivity. Students will design, document, and test the network services and manage the project using project management methods, tools and software. Prerequisite: NST 121 or NST 226 with a grade of “C” or better. 3 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
RADIATION PROTECTION OPTION
INSTRUMENTATION AND CONTROL OPTION
REACTOR OPERATIONS OPTION
QUALITY CONTROL OPTION

41.0205

(Associate of Applied Science Degree)

The Nuclear Technology program offers the student a unique opportunity to obtain state-of-the-art training 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, 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. Therefore, job placement prospects are highly favorable and starting salaries reflect this high demand.

The Associate of Applied Science (AAS) degree program offered at the Advanced Technology Center in Mexico, Missouri is the only one of its kind in Missouri and one of only a handful in the nation. It was developed cooperatively with the Missouri University Research Reactor, the University of Missouri Nuclear Science and Engineering Institute, AmerenUE Callaway Nuclear Power Plant, and Exelon Nuclear Corporation, all leaders in the nuclear industry.

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 accrediting organizations for training and qualification of radiological protection technicians, reactor operators, and maintenance and quality control technicians. The program offers four options which include radiation protection, instrumentation and control, reactor operations, and quality control. An eight-week internship is included as a part of the curriculum in the second year at an approved company.

This program is only offered in Mexico, Missouri, at the Advanced Technology Center.

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 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 students the opportunity to develop the skills necessary to:

- Communicate nuclear technology related concepts effectively in both oral and written formats.
- Appraise worksite conditions requiring radiological controls. Develop a design and plans that will minimize personnel exposure to radiation.
- Troubleshoot electrical and mechanical equipment.
- Evaluate changing nuclear reactor plant conditions.
- Conduct nuclear work while employing human performance tools to minimize human error.
- Inspect and test nuclear plant systems, structures and components.

CORE CURRICULUM			Credit Hours
MNT	101	Time Management	1
MNT	105	Basic Nuclear Math and Theory	3
MNT	185	Reactor Plant Components	2
MNT	195	Basic Reactor Safety, Theory, and Operations	3
MNT	211	Piping and Instrumentation Drawings	2
MNT	290	Internship	4
MAR	101	Introduction to Electricity	4
MAR	111	Mechanical and Fluid Power Transmission	4
COM	211	Technical Writing	3
SUB-TOTAL			26

GENERAL EDUCATION REQUIREMENTS			
General Education Requirements			19
(see pages 39 & 40)			4
Must Include: PHY 101/102 College Physics			19
SUB-TOTAL			

PROGRAM REQUIREMENTS			
Radiation Protection Option			
MNT	114	Introduction to Radiation Safety	4
MNT	223	Radiation Detection	3
MNT	233	Radiation Dosimetry	3
MNT	249	Radiation Protection	3
PHY	121	General Chemistry I	5
SUB-TOTAL			18

OR			
Instrumentation and Control Option			
MNT	260	Nuclear and Special Process Instrumentation	2
MNT	264	Hydraulic and Pneumatic Measurement and Control Systems	2
MNT	268	Monitoring Systems and Troubleshooting	2
MAR	118	Industrial Motors and their Controls	4
MAR	125	Applied Electronics	4
MAR	204	PLC Programming	4
MAR	218	Computer Interfacing	3
SUB-TOTAL			21

OR			
Reactor Operations Option			
MNT	270	Thermodynamics, Fluid Flow, and Advanced Reactor Theory	5
MNT	274	Reactor Plant Systems	3
MNT	278	Reactor Plant Operations	4
MAR	125	Applied Electronics	4
PHY	121	General Chemistry I	5
SUB-TOTAL			21

OR			
Quality Control Option			
MNT	280	Blueprint Reading, Metrology and Calibration	2
MNT	282	Codes, Standards and Regulations	2
MNT	284	Preventive and Corrective Actions	2
MNT	286	Advanced Measurement, Testing and Materials	4

MNT	288	Quality Audits	2
MAR	150	Machine Shop Fundamentals	4
		SUB-TOTAL	16
GRADUATION REQUIREMENT			
BUS	125	Job Search Strategies	1
		SUB-TOTAL	1
PROGRAM TOTAL			62-67

MNT 101 Time Management. This course includes strategies essential for success in a college and work environment. Skills such as reading, test preparation, test taking, and overall time management techniques are discussed. It is recommended this course be taken during the first semester to provide the student a place in which issues encountered may be addressed, and techniques applied during the entire course of study and beyond. Students will be introduced to the expectations and responsibilities of a nuclear technician. Human performance tools will also be discussed and applied. 1 credit hour.

MNT 105 Basic Nuclear Math and Theory. Introduction to basic nuclear concepts using mathematics including dimensional analysis, algebra, geometry, and trigonometry. Additional topics include atomic structure, nuclear reactions, mass to energy conversion, industrial and science applications of nuclear processes, and risk/benefit analysis. Prerequisite: MAT 050 with a grade of "C" or better or SPM 050 with a passing grade or satisfactory placement score into MAT 070. 3 credit hours.

MNT 114 Introduction to Radiation Safety. Topics include types of radiation, radioactive decay, activity, radioactive sources, interaction of radiation with matter, radiation units, basic fundamentals of exposure, dose, and personnel dose. The course also includes a basic radiation protection tasks laboratory. Prerequisite: MNT 105. Corequisite: MAT 115. 4 credit hours.

MNT 185 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. 2 credit hours.

MNT 195 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. In addition, basic radiation worker training will be provided in this course. 3 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. Prerequisite: MAR 101. Corequisite: MAR 111. 2 credit hours.

MNT 223 Radiation Detection. Types of detector systems (ionization, Geiger-Muller, proportional counters, liquid and solid scintillation, semiconductor) and their uses, statistics of radioactive decay, systems for radiation detection (NIMBIN systems, preamplifiers, amplifiers, single channel analyzers, multi-channel analyzers), experimental design and measurement, data reduction. Laboratories will include measurement of radioactive decay, measurement of radiation attenuation, utilization of systems for alpha, beta and gamma radiation counting and spectroscopy. Corequisite: MNT 114. 3 credit hours.

MNT 233 Radiation Dosimetry. Radiation biology, radiation effects on simple chemical systems, biological molecules, cell, organisms and humans. Stochastic vs. deterministic effects, units of exposure, dose and dose equivalent, external dosimetry, internal dosimetry, control of external and internal exposure, detector and instrumentation systems for measuring dose. Corequisite: MNT 114. 3 credit hours.

MNT 249 Radiation Protection. Practical applications and demonstrations of radiation protection and health physics. Radiological survey & analysis instruments, radiation monitoring systems, sample collection equipment, calibration sources and equipment, radiological protection standards, contamination control, monitoring of radiological work, radiological incident evaluation and control, decontamination, radioactive materials control, environmental monitoring. Prerequisites: MNT 223 and MNT 233. 3 credit hours.

MNT 260 Nuclear and Special Process Instrumentation. Topics include principles of operation of radiation detectors, conductivity cells, turbidity detectors, dissolved oxygen instruments, and reactor protection systems including reactivity control instrumentation systems. Sensors, transmitters, signal convertors, and auxiliary equipment that support these special instruments are also covered. Includes a technical lab component. Prerequisites: MNT 185, MNT 195, and MAR 204. 2 credit hours.

MNT 264 Hydraulic and Pneumatic Measurement and Control Systems. Topics include operational principles of flow, temperature, and pressure measurement systems, hydraulic and pneumatic sensors and actuators, variable speed pump controls, and associated processors and control loop systems. Includes a technical lab component. Prerequisites: MNT 185, MNT 195, and MAR 204. 2 credit hours.

MNT 268 Monitoring Systems and Troubleshooting. This course covers troubleshooting various mockups of nuclear monitoring systems for systems that include components covered in the Nuclear and Special Process Instrumentation course. Includes a technical lab component. Prerequisites: MNT 260 and MNT 264. 2 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 185 and MNT 195. 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. Prerequisites: MNT 185 and MNT 195. 3 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 274. 4 credit hours.

MNT 280 Blueprint Reading, Metrology and Calibration. This course focuses on blueprint reading and interpretation, proper use of measurement and test equipment, and equipment and gage calibration. Blueprint reading instruction includes symbols and components, geometric dimensioning and tolerancing (GD&T) terminology. Various measurement and test equipment is taught which includes but is not limited to coordinate measuring machines (CMM), electronic measuring, gages, optical tools, force measurement, weights, and hardness testing. Prerequisite: MAR 150. 2 credit hours.

MNT 282 Codes, Standards and Regulations. An introduction to the controlling codes, standards, and regulations and are used in the nuclear industry including 10 CFR Part 21 and 10 CFR 50 Appendix B, ANSI, ASME, ISO, SAR, Six Sigma and other applicable standards. 2 credit hours.

MNT 284 Preventive and Corrective Actions. Students are taught to identify and apply various preventive methods including both design and process failure mode and effects analysis. Elements of corrective action and failure/root cause analysis are discussed. The student will learn to determine whether products or material meet conformance requirements, and use various methods to label and segregate nonconforming materials, and the steps in determining fitness-for-use and product disposition. 2 credit hours.

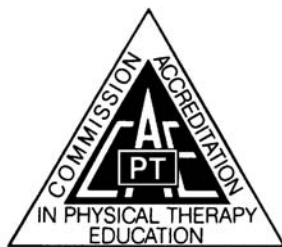
MNT 286 Advanced Measurement, Testing and Materials. This course teaches advanced measurement and testing of materials using various means while concentrating on inspection techniques and processes. Topics include: electrical testing of raceways, cable, conduit and supports; nondestructive testing (NDT) including x-ray, eddy current, ultrasonic, dye penetrant, electromagnetic and magnetic particle; destructive testing including tensile, fatigue, and flammability; and sampling procedures. Prerequisites: MNT 280 and MNT 282. 4 credit hours.

MNT 288 Quality Audits. Basic audit types are taught such as internal, external system, product, processes, etc. Emphasis is on auditing tools and techniques and audit preparation, performance, record-keeping, closure, and verification. 2 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, or nuclear reactor maintenance. 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. Prerequisite: Department Chair approval - GPA of 2.500 or better required. 4 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.

PHY 121 General Chemistry I. This is an introductory course dealing with the fundamental principles of chemistry. Meets for 3 hours of class and 4 hours of lab each week. Prerequisite: Two years of high school algebra or must be enrolled in or have completed College Algebra. This course is taught by Moberly Area Community College at the Advanced Technology Center in Mexico, Missouri. 5 credit hours.



PHYSICAL THERAPIST ASSISTANT
51.0806
(Associate of Applied Science Degree)

This program prepares students for a profession as a Physical Therapist Assistant and is accredited by the Commission on Accreditation in Physical Therapy Education, 1111 North Fairfax Street, Alexandria, VA 22314; 703-706-3245; accreditation@apta.org; www.captionline.org. Graduates receive an Associate of Applied Science degree. A grade of “C” or above must be maintained in all Physical Therapist Assistant courses and the student must successfully complete 600 clock hours of supervised internship in clinical facilities.

The Physical Therapist Assistant 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 health care, clinics or school systems.

In this five-semester program, classes are offered primarily in the afternoons and evenings in Jefferson City. 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.

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 for the specific application requirements and deadline.

Students who are admitted to the Physical Therapist Assistant program should be aware that they may be subject to drug testing as a safety precaution. Criminal background checks will be required prior to clinical placement.

Program Mission

The Physical Therapist Assistant program prepares competent physical therapist assistants who contribute toward meeting the health care needs of Missourians.

Program Goals

The goals of the program are to:

- Prepare competent, entry level physical therapist assistants who will assume positions and contribute to meeting employment needs in Missouri.
- Provide opportunities for students to develop behaviors and skills sought by employers.
- Furnish opportunities for physical therapist assistant students to develop competencies in communication, professionalism, and leadership.
- Empower students to respond to developing technology and a dynamic health care environment through a commitment to lifelong learning and service.

CORE CURRICULUM

			Credit Hours
PTA	110	Medical Terminology	2
PTA	113	Health and Disease I	3
PTA	114	Basic Patient Care	3
PTA	115	Basic Patient Care Lab	1
PTA	118	Functional Anatomy and Kinesiology	3
PTA	119	Functional Anatomy and Kinesiology Lab	1

PTA	122	Physical Agents and Modalities	2
PTA	124	Physical Agents and Modalities Lab	2
PTA	126	Clinical Practice I	1
PTA	207	PTA as a Profession	3
PTA	212	Orthopedic Therapeutic Exercise	2
PTA	213	Orthopedic Therapeutic Exercise Lab	1
PTA	214	Health and Disease II	3
PTA	216	Trends and Issues in Physical Therapy	2
PTA	223	Neurological Therapeutic Exercise	3
PTA	224	Neurological Therapeutic Exercise Lab	2
PTA	226	Clinical Practice II	2
PTA	236	Clinical Practice III	7
		SUB-TOTAL	43

GENERAL EDUCATION REQUIREMENTS

General Education Requirements (see pages 39 & 40)	19
SUB-TOTAL	19

PROGRAM REQUIREMENTS

COM	289	Research Methods in Physical Therapy	2
ASC	101	Human Anatomy and Physiology w/Lab	4
PSY	161	Health Psychology	3
		SUB-TOTAL	9

GRADUATION REQUIREMENT

BUS	125	Job Search Strategies	1
		SUB-TOTAL	1

PROGRAM TOTAL

PTA 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. 2 credit hours.

PTA 113 Health and Disease I. This course examines the disease process and surveys many diseases that affect the cardiovascular, respiratory, musculoskeletal, integumentary, urinary, reproductive and endocrine systems. The process of inflammation and repair are emphasized. As each system is examined, clinical manifestations and possible physical therapy interventions are reviewed. The student learns and utilizes medical and professional terminology throughout this course. Prerequisites: PTA 114, PTA 115, PTA 118, and PTA 119 with a grade of “C” or better. 3 credit hours.

PTA 114 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. Prerequisite: ASC 101 with a grade of “C” or better. Concurrent: PTA 115. 3 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. Prerequisite: ASC 101 with a grade of “C” or better. Concurrent: PTA 114. 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. Prerequisite: ASC 101 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. Prerequisite: ASC 101 with a grade of “C” or better. Concurrent: PTA 118. 1 credit hour.

PTA 122 Physical Agents and Modalities. This lecture course provides the physical therapist assistant 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. A study of pain and pain control using modalities is included. Medical terminology related to physical agents is used in verbal and written communication throughout the course. Prerequisites: PTA 114, PTA 115, PTA 118, and PTA 119 with a grade of “C” or better. Concurrent: PTA 124. 2 credit hours.

PTA 124 Physical Agents and Modalities Lab. This lab course provides the physical therapist assistant student with opportunities to practice clinical application skills needed to perform various treatment modalities used in physical therapy. Emphasis is placed on critical thinking and problem solving to assure that the modality is applied to maximize treatment effectiveness. Safety procedures, indications, contraindications and precautions are reviewed for each modality. The student learns to use professional and understandable terminology in written and verbal communication relative to physical agents. Prerequisites: PTA 114, PTA 115, PTA 118, and PTA 119 with a grade of “C” or better. Concurrent: PTA 122. 2 credit hours.

PTA 126 Clinical Practice I. This is a two 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 concepts and skills learned in the classroom to the clinical setting. Emphasis will be on the connection between theoretical and foundational knowledge to direct and indirect patient care activities. The student will work under the direct supervision of a licensed physical therapy professional in an assigned/approved facility. Acquisition of appropriate professional behaviors related to the role of the physical therapist assistant in current practice is also emphasized. Prerequisites: PTA 114, PTA 115, PTA 118, and PTA 119 with a grade of “C” or better. 1 credit hour.

PTA 207 PTA as a Profession. This course provides an introduction to the role and scope of PTA and PT practice. Students learn legal and ethical concepts guiding professional behavior and conduct, develop an awareness of the health care delivery system, cultural diversity and work performance and expectations. Students develop skills in using professional terminology for oral and written communications. Integration of learning experiences with concurrent technical course is used to apply and reinforce knowledge. Prerequisites: PTA 114, PTA 115, PTA 118, and PTA 119 with a grade of “C” or better. 3 credit hours.

PTA 212 Orthopedic Therapeutic Exercise. This lecture course involves an in-depth study of physical therapy data collection and interventions for orthopedic and cardiopulmonary clients. A broad range of therapeutic exercise techniques are introduced and the relationship between interventions and anatomical structure, function and pathophysiology is examined. The student reviews the role of the PTA as a part of the rehabilitation team related to development and delivery of orthopedic therapeutic exercise. Prerequisites: PTA 114, PTA 115, PTA 118, and PTA 119 with a grade of “C” or better. Concurrent: PTA 213. 2 credit hours.

PTA 213 Orthopedic Therapeutic Exercise Lab. This lab course addresses the implementation of various exercise techniques and interventions, which are introduced in the associated lecture course. The student learns to interpret the PT plan of care and to design and instruct patients in exercises and functional activities. Lab experiences promote development of professional behaviors and skills for effective communication and teaching. Prerequisites: PTA 114, PTA 115, PTA 118, and PTA 119 with a grade of “C” or better. Concurrent: PTA 212. 1 credit hour

PTA 214 Health and Disease II. This course surveys many disease processes including infectious diseases; neoplasms; hereditary diseases; pediatric pathologies; digestive system, liver, gall bladder and kidney disorders; nervous system pathologies including TBI, CVA, SCI; and disorders commonly seen in the elderly. Emphasis is placed on physical changes and disorders throughout the life span. Special concerns of the pediatric and geriatric populations are addressed. Students are challenged to develop understanding of pathologies and the ability to convey information about various disease processes using professional terminology. Prerequisites: PTA 113, PTA 122, PTA 124, PTA 207, PTA 212, and PTA 213 with a grade of “C” or better. 3 credit hours.

PTA 216 Trends and Issues in Physical Therapy. This course utilizes a seminar format to study current issues and trends affecting the physical therapy profession. Student preparation for licensure and PTA practice is enhanced through the use of selected guest speakers in areas pertinent to the profession. Prerequisites: PTA 214, 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 treatment of neurological dysfunction. Principles and concepts pertaining to sensation, perception, motor control, posture, balance, coordination, functional mobility and ambulation are included. The student examines theories and techniques of therapeutic intervention commonly used in treatment. 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 113, PTA 122, PTA 124, PTA 207, PTA 212, and PTA 213 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 treatment of adult neurological dysfunction and gives the student the opportunity to practice professional behaviors as well as clinical skills in a lab setting. Principles and procedures related to motor control, sensation, perception, therapeutic exercise, posture, balance and gait analysis and 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, develop effective communication skills for patient/client and family education and utilize appropriate medical language through written and verbal communications. Prerequisites: PTA 113, PTA 122, PTA 124, PTA 207, PTA 212, and PTA 213 with a grade of “C” or better. Concurrent: PTA 223. 2 credit hours.

PTA 226 Clinical Practice II. This is a three week (40 hours per week) clinical experience that provides the student with opportunities for hands-on patient care. The student will apply concepts and skills learned in the classroom to the clinical setting. As in Clinical Practice I, emphasis will be on the connection between theoretical and foundational knowledge to direct and indirect patient care activities. The student will work under the direct supervision of a licensed physical therapy professional in an assigned/approved facility. The student will work with a variety of patients to develop competence in clinical skills as a member of the rehabilitation team. Acquisition of appropriate professional behaviors related to the role of the physical therapist assistant in current practice is also a focus of this clinical experience. Prerequisites: PTA 113, PTA 122, PTA 124, PTA 207, PTA 212, and PTA 213 with a grade of “C” or better and PTA 126 with a passing grade. 2 credit hours.

PTA 236 Clinical Practice III. This is a ten week (40 hours per week) clinical experience that provides the student with opportunities for hands-on patient care. The student will apply concepts and skills learned in the classroom to the clinical setting. As in Clinical Practice I and II, emphasis will be on the connection between theoretical and foundational knowledge to direct and indirect patient care activities. The student will work under the direct supervision of a licensed physical therapy professional in an assigned/approved facility. The student will interact 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 as part of the interdisciplinary team. Prerequisites: PTA 214, PTA 223, PTA 224, and PTA 226 with a grade of “C” or better. 7 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
47.0611
(Associate of Applied Science Degree)

The Powersports Technology program prepares individuals to perform maintenance, troubleshooting and overhaul of the major components of on-road and off-road powersports equipment. Instruction is provided in the classroom on theory, inspection, maintenance, troubleshooting and repair of wheels, brakes, operating controls, steering, suspension, electrical circuitry, electronic/mechanical engines, and manual/automatic shift transmissions. In order to participate in the Powersports Technology program, each student must be sponsored by a Missouri Powersport Dealers Association member who provides four required internship experiences unless an exception is approved.

Enrollment in the Powersports 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.

Graduates of the two-year Associate of Applied Science degree (AAS) program will have the technical competencies required to be productive in an entry-level powersports technician position. They can expect to find employment with original equipment manufacturer dealers, independent powersports sales and service shops, golf course maintenance shops, and government agencies involved in natural resource management.

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

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 industry.

Program Goals

The goals of the program are to provide opportunities for students to develop and demonstrate:

- Electrical knowledge and skills needed to repair and maintain on-road and off-road powersports equipment.
- Knowledge and skills necessary to repair, maintain and troubleshoot two-stroke and four-stroke engines.
- Knowledge and skills necessary to repair, maintain and troubleshoot drive train, suspension, and hydraulic brake systems as they relate to on-road and off-road powersports equipment.
- Critical thinking skills used in troubleshooting.
- Oral and written communication skills needed in the powersports industry.

CORE CURRICULUM

			Credit Hours
PST	100	Introduction to Powersports Technology	2
PST	110	Preventive Maintenance & Inspection	2
PST	120	Electrical I	2
PST	130	Accessory Systems	2
PST	140	Wheels, Tires, & Brakes	2
PST	145	Frame & Suspension Systems	2
PST	150	Engine I	2
PST	175	Engine II	2
PST	190	Internship I	4
PST	210	Power Transmission Systems	2
PST	220	Electrical II & Electronics	3
PST	230	Job Estimating, Troubleshooting, & Diagnostics	2
PST	240	The Business of Powersports	2
PST	250	Engine III	4
PST	270	Internship II	4
PST	280	Internship III	4
PST	290	Internship IV	4
		SUB-TOTAL	45

GENERAL EDUCATION REQUIREMENTS		
General Education Requirements (see pages 39 & 40)		19
Must Include:	COM 111 Oral Communications	3
	PHY 100 Physical Science	4
	OR	
	PHY 103/104 Environmental Science	4
	SUB-TOTAL	19
PROGRAM REQUIREMENT		
MPT	165	3
	Basic Welding	3
	SUB-TOTAL	3
GRADUATION REQUIREMENTS		
BUS	125	1
	Job Search Strategies	1
	SUB-TOTAL	1
<p>It is a graduation requirement of the Powersports Technology (PST) program for students to earn a grade of "C" or better in all "Core Curriculum" and "Program Requirement" courses.</p>		
PROGRAM TOTAL		68

PST 100 Introduction to Powersports Technology. This course introduces and illustrates all components of powersports equipment. Safety, environmental protection, tool usage, fasteners, and gaskets are covered. 2 credit hours.

PST 110 Preventive Maintenance & Inspection. This course includes instruction in lubrication and cooling systems of powersports equipment. 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. 2 credit hours.

PST 120 Electrical I. This course includes instruction in battery, charging, and ignition systems of powersports equipment. 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 Accessory Systems. This course includes instruction in the fundamentals and troubleshooting of accessory systems used on powersports equipment. Lighting systems, warning devices, communication systems, and cruise control are covered. The importance of switches in electrical circuits is emphasized. 2 credit hours.

PST 140 Wheels, Tires, & Brakes. This course includes instruction in powersports equipment 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 145 Frame & Suspension Systems. This course includes instruction on powersports equipment 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 150 Engine I. This course includes instruction on two-stroke engines for powersports equipment. 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 175 Engine II. This course includes instruction on four-stroke engines for powersports equipment. 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. Prerequisite: PST 150. 2 credit hours.

PST 190 Internship I. In order to participate in the Powersports Technology internship, each student must be sponsored by a powersports employer who provides this required supervised experience. Students are required to work a minimum of eight 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. 4 credit hours.

PST 210 Power Transmission Systems. This course includes instruction on the various types of powersports equipment primary drives, clutches, transmissions, and final drives that are used to achieve the desired gear reduction, speed, and engine torque multiplication. Inspection, diagnosis, adjustment, overhaul, and reassembly procedures are covered. 2 credit hours.

PST 220 Electrical II & Electronics. This course includes instruction on the safety precautions and knowledge required to service powersports equipment 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 230 Job Estimating, Troubleshooting, & Diagnostics. This course includes instruction on diagnosing and troubleshooting problems and estimating the time and cost involved with repairs of powersports equipment. 2 credit hours.

PST 240 The Business of Powersports. This course includes instruction on powersports career opportunities, storing equipment, procedures for returning equipment to service after storage, safety issues and procedures, and original equipment manufacturer warranty policies. 2 credit hours.

PST 250 Engine III. This course includes instruction on the variations in powersports equipment four-stroke and two-stroke engines and their components. Inspection, servicing, and repair procedures are covered. The importance of organization and using correct procedures during the removal and disassembly of engines, primary drives, transmissions, and final drives are covered including common problems and special disassembly methods. Prerequisite: PST 175. 4 credit hours.

PST 270 Internship II. In order to participate in the Powersports Technology internship, each student must be sponsored by a powersports employer who provides this required supervised experience. Students are required to work a minimum of eight 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. 4 credit hours.

PST 280 Internship III. In order to participate in the Powersports Technology internship, each student must be sponsored by a powersports employer who provides this required supervised experience. Students are required to work a minimum of eight 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. 4 credit hours.

PST 290 Internship IV. In order to participate in the Powersports Technology internship, each student must be sponsored by a powersports employer who provides this required supervised experience. Students are required to work a minimum of eight 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. 4 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.

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