



2023 – 2024 Catalog

ACCREDITATIONS



Middle States Commission on Higher Education (MSCHE)

Website: <https://www.msche.org/>

American Veterinary Medical Association (AVMA),

Veterinary Technology Program

Commission on Accreditation in Physical Therapy Education (CAPTE)

Physical Therapist Assistant Program

Joint Review Committee on Education in Radiologic Technology (JRCERT),

20 North Wacker Drive, Suite 2850 Chicago, IL 60606-3182

(312) 704-5300 e-mail: mail@jrcert.org

Radiologic Technology Program

National Automotive Technicians Education Foundation, Inc. (NATEF),

Automotive Technology Program

APPROVALS

Pennsylvania Department of Education, State Board of Education

United States Department of Education, Title IV Assistance

Pennsylvania Higher Education Assistance Agency (PHEAA)

Office of Vocational Rehabilitation

Veterans Training

American Design Drafting Association (ADDA) International

Curriculum Certification, Drafter Level,

Architectural Drafting & Design Technology Program

REGISTRATIONS

United States Department of Agriculture

www.johnson.edu

3427 NORTH MAIN AVENUE • SCRANTON • PENNSYLVANIA 18508-1495

(570) 342-6404

(800) 293-9675

About This Catalog

This catalog is a primary reference source for students, faculty, staff, and the community and will answer many, if not all, questions regarding Johnson College.

Johnson College reserves the right, in its sole judgment, to make changes of any nature in its programs, calendar, or academic schedule whenever it is deemed necessary or desirable. Changes may include course content, scheduling of classes, and canceling of classes and other academic activities. The College will make every effort to provide students with timely notification of such changes.

This catalog does not establish a contractual relationship but summarizes current information regarding the calendar, admissions, degree requirements, fees, regulations, and course offerings. The information contained in this catalog is correct at the time of printing. Changes in policy, requirements, and regulations may occur during the year.

Student Responsibilities

Johnson College students are responsible for reading and abiding by all rules and policies described in this Catalog, individual program area handbooks, and the Student Handbook which includes the Community Code of Ethics. Students are personally responsible for following policies and procedures as they affect their academic progress, financial obligations, and relationships with College authorities, and eligibility for graduation.

Accreditation

Middle States Commission on Higher Education (MSCHE)

Email: info@msche.org

Website: www.msche.org

Spanish: espanolinfo@msche.org



The Automotive Technology Program is accredited by the
National Automotive Technicians Education Foundation, Inc. (NATEF)

101 Blue Seal Drive, S.E. Suite 101, Leesburg, VA 20175

Phone: 1-703-669-6650

Email: webmaster@natef.org

Website: www.natef.org



The Heavy Equipment Technology program is
provisionally accredited by the
Associated Equipment Distributors (AED).

650 E Algonquin Road, Ste 305 Schaumburg IL 60173

Telephone: 630.574.0650

Email: info@aednet.org

Website: www.aednet.org



The Physical Therapist Assistant Program at Johnson College is accredited by the
Commission on Accreditation in Physical Therapy Education (CAPTE)

1111 North Fairfax Street, Alexandria, Virginia 22314;

Phone: 703-706-3245;

Email: accreditation@apta.org

Website: www.capteonline.org



Commission on Accreditation
in Physical Therapy Education

The Radiologic Technology Program is accredited by the
Joint Review Committee on Education in Radiologic Technology (JRCERT)
20 North Wacker Drive, Suite 2850, Chicago, IL 60606-3182
Phone: (312)704-5300
E-mail: mail@jrcert.org
Website: www.jrcert.org



The Veterinary Technology Program is accredited by the
American Veterinary Medical Association (AVMA)
1931 North Meacham Road, Suite 100, Schaumburg, IL 60173-4360
Phone: 800.248.2862
Fax: 847.925.1329
Website: www.avma.org



Curriculum Approval

The Architectural Drafting & Design Technology program has curriculum approval at the Drafter level by the American Design Drafting Association International (ADDA).
105 East Main Street, Newbern, Tennessee 38059
Telephone: 731.627.0802
Fax: 731.627.9321
Website: www.adda.org

Institution Participation

Johnson College is approved to participate in the National Council for State Authorization Reciprocity Agreements.



General College Policies

Policy for Policies

The college policies promote the college's mission, enhance operational efficiency and college governance, and communicate expectations relating to conduct, thereby reducing institutional risk. Johnson College expects faculty, staff, and students to be familiar with and adhere to all applicable policies. In order to promote accessibility to current policies, as well as consistency and clarity of content, this policy establishes a framework, common format, roles and responsibilities and process for adoption, review, revision and dissemination of all policies as defined in this policy.

Non-Discrimination Policy

Johnson College does not discriminate with regard to race, color, creed, age, national or ethnic origin, religion, disability, sex, sexual orientation, gender, gender identity and expression, including a transgender identity, genetics, veteran status, or ancestry in the administration of its educational and admission policies, scholarship, loan, athletic and other school administered programs, or employment practices in accordance with Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, the Americans with Disabilities Act of 1990, or any other legally protected category. For information regarding civil rights and grievance procedures, contact the Title IX Coordinator of Johnson College, 3427 North Main Avenue, Scranton, PA 18508; (570) 702-8944.

Felony and Probation Policy

Johnson College has an affirmative obligation to advise students that a prior felony conviction may impede their ability to complete the requirements of certain academic programs, to meet the licensure requirements for certain professions, and find employment in field. Once so advised, students may not be prohibited from pursuing a particular course of study.

Pregnancy Policy

It is the student's choice whether or not to inform the Program Director of a pregnancy. If a student chooses not to do so, no accommodations can be made regarding the student's internship assignment or program of study. Students who choose to disclose their pregnancy should contact the Program Director.

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2023-2024 ACADEMIC CALENDAR

Fall Semester 2023

Aug. 28	First day of classes	Monday
Sept. 1	Last day to drop or add courses	Friday
Sept. 4	Labor Day (College closed)	Monday
Sept. 8	Last day to resolve "I" grades	Friday
Oct. 9	Fall Break (College closed)	Monday
Oct. 10	Replacement day (MONDAY SCHEDULE)	Tuesday
Nov. 3	Last day to withdraw from classes	Friday
Nov. 8	Replacement day (FRIDAY SCHEDULE)	Wednesday
Nov. 10	Veterans Day (College closed)	Friday
Nov. 23-24	Thanksgiving Break (College closed)	Thursday, Friday
Dec. 8	Semester ends	Friday
Dec. 11	Final grades due	Monday

Interession Term

Dec. 10	First day of classes	Sunday
Dec. 17	Last day for course drop/add/withdraw	Sunday
Jan. 14	Term ends	Sunday

Spring Semester 2024

Jan 15	Martin Luther King, Jr. Day (College closed)	Monday
Jan. 16	First day of classes	Tuesday
Jan. 22	Last day to drop or add courses	Monday
Jan. 29	Last day to resolve "I" grades	Monday
Feb. 19	Presidents Day (College closed)	Monday
Mar. 4-8	Spring Break (No classes)	Monday – Friday
Mar. 19	Replacement day (MONDAY SCHEDULE)	Tuesday
Mar. 29	Last day to withdraw from classes	Friday
Mar. 29-Apr 1	Break (College closed)	Friday – Monday
Apr. 4	Replacement day (MONDAY SCHEDULE)	Thursday
May 3	Semester Ends	Friday
May 6	Final grades due	Monday
May 10	Commencement Rehearsal	Friday
May 11	Commencement	Saturday

Summer Terms

May 13	Summer Session I Begins	Monday
May 19	Last day for course drop/add/withdraw	Sunday
May 27	Memorial Day (College closed)	Monday
Jun. 16	Summer Session I Ends	Sunday
Jun. 19	Juneteenth (College closed)	Wednesday
Jun. 24	Summer Session II Begins	Monday
Jun. 30	Last day for course drop/add/withdraw	Sunday
Jul. 4	Independence Day (College closed)	Thursday
Jul. 28	Summer Session II Ends	Sunday

Institutional Overview

Johnson College is a vital resource for career and technical education in Northeastern Pennsylvania. The College was founded by Orlando S. Johnson, a wealthy coal baron in Scranton who left the bulk of his estate to form a trade school for secondary-level students, teaching them “useful arts and trades that may enable them to make an honorable living and become contributing members of society.” In 1964, the school transitioned to a post-secondary institution offering certificates. Throughout the century, new buildings were constructed, and degree programs added.

Today, Johnson College offers associate degree programs, academic certificates, and numerous job training opportunities. The Continuing Education department offers non-credit training programs to upskill the local workforce in areas of machining, carpentry, drafting, and automotive repair. The College also supports the area’s youth by offering STEM training through summer camps, after-school activities, or other special events. The College honors multiple articulation agreements with post-secondary institutions and dual enrollment agreements with multiple secondary schools. The College also participates in the Pennsylvania Department of Education’s Students Occupationally and Academically Ready (SOAR) Program of Study (POS) educational plan that articulates the secondary career and technical courses to a postsecondary program. The faculty and staff are dedicated individuals to support the student experience, either through teaching or through educational support services and administration.

Johnson College is an accredited institution and a member of the Middle States Commission on Higher Education (MSCHE) 1007 North Orange Street, 4th Floor, MB #166, Wilmington, DE 19801 or www.msche.org. Johnson College’s accreditation status is Accreditation Granted. MSCHE is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Council for Higher Education Accreditation (CHEA).

Several Johnson College programs maintain additional accreditation through agencies such as the American Design Drafting Association International, Associated Equipment Distributors, the Commission on Accreditation in Physical Therapy Education, the Joint Review Committee on Education in Radiologic Technology, the American Veterinary Medical Association, and the National Automotive Technicians Education Foundation.

Mission Statement

Johnson College provides industry focused, hands-on learning in a supportive environment and prepares graduates to enter into and advance in their careers.

Vision Statement

To make the world our campus through industry partnerships and experiential learning by teaching the students of today the skills of tomorrow.

Institutional Goals



Goal I: Foster a culture of innovative instructional practices to enhance students' academic performance.



Goal II: Promote an inclusive environment to expand and support a diversified population.



Goal III: Integrate student support systems in a meaningful way to foster success.



Goal IV: Enhance industry and community relationships for the mutual benefit of students and the marketplace.



Goal V: Optimize resources to reflect our continued commitment to responsible growth

Shared Values

Forward-thinking: We strive to be the leaders of change. We anticipate hurdles, innovate, and make incremental improvements by embracing an innovative and proactive attitude.

Equity: We adopt an equity framework that proactively seeks to make Johnson College accessible, affordable, and inclusive for all people.

Student-centered: The best interest of our students are a central consideration in all we do.

Collaboration: We interact with dignity and respect for those with whom we work, inside and outside the College, to ensure productive and quality partnerships.

Advancement: We have the courage and curiosity to challenge the status quo, innovate and take calculated risks. We find new ways to move forward which translates into growth for our students, our campus, and our community.

The institutional goals and shared values of our organization are those on which we build the foundation, perform work, and conduct ourselves.

Educational Plan

Students come to Johnson College to prepare themselves as entry-level technicians in the industry and professional community.

To accomplish this primary objective, students pursue 40+ credits of program major coursework and 20+ credits of core career coursework. The faculty-student ratio is 8:1.

Faculty members bring to each program a combination of professional education and sound, practical experience. The faculty exhibits a personal interest in the progress of all students, encouraging and assisting them to achieve the maximum benefit from their programs of study.

The physical facilities consist of modern classrooms, occupational areas, and laboratories that are furnished with tools, machines, equipment and materials that are required to provide a thorough program of education. Equipment used for training in each program of education is representative of that found in industry and is selected to provide the student with the broadest educational experience possible. Examples of this equipment consist of hand and power tools, specialized testing and repairing apparatus, industrial units, and clinical devices. Our academic programs provide an extension of this exposure by requiring students to participate in experiential learning opportunities at off-campus locations.

Learning opportunities are enhanced through the use of the College Resource Center which is kept current with books, periodicals, and brochures and provides students with high speed internet access. The Resource Center provides for the gathering of information from a variety of outside services and is a member of the Northeast Pennsylvania Library Consortium. In addition, close contact is maintained with institutional and industrial libraries in the area which provide additional sources of reference information. Further learning comes from the use of educational videos, field trips, and presentations by business and industrial professionals.

Careers in technology are constantly changing as a result of new products and developments in materials, tools, machinery, equipment, methods and techniques. Program Advisory Committees, comprised of representatives from business and industry, meet regularly with the faculty and administration to make suggestions on course content and program curricula so that College programs are kept current.

Degrees Awarded

Johnson College is approved by the Pennsylvania Department of Education and the State Board of Education to award two degrees, the Associate in Science (A.S.) degree and the Associate in Applied Science (A.A.S.) degree. All the programs of study prepare graduates for entry-level positions in their field of study.

The Associate in Science (A.S.) degree is awarded to students who graduate from the following programs:

- Computer Information Technology
- Physical Therapist Assistant
- Radiologic Technology
- Veterinary Nursing

The Associate in Applied Science (A.A.S.) degree is awarded to students who graduate from the following programs:

- Advanced Manufacturing Technology
- Architectural Drafting & Design Technology
- Automotive Technology
- Aviation Technology
- Biomedical Equipment Technology
- Carpentry & Cabinetmaking Technology
- Civil Design Technology
- Diesel Truck Technology
- Electrical Construction Technology
- Electronic Engineering Technology
- Heating, Ventilation, & Air Conditioning Technology
- Heavy Equipment Technology
- Mechatronics Technology
- Welding Fabrication & Manufacturing Technology

Academic Certificates Awarded

The Certificate is awarded to students who graduate from the following programs:

- Building and Property Maintenance Technology
- Diesel Preventative Maintenance Technology
- Industrial Technology
- Welding Technology

Continuing Education

Johnson College's Continuing Education Program distinguishes itself from the College's two-year degree programs and certificate courses by providing adult students with the

opportunity to improve their skills while helping them stay ahead of the competition, learn new technologies, and advance in their careers. The College's Continuing Education courses are developed through collaboration with industry partners, are often taught by industry professionals, and are utilized and recognized by industry partners. This program also includes pre-employment skills testing and exclusive online courses offering certification classes for essential industries. Johnson College assists individual students and industry partners in obtaining funding, so their continuing education courses are cost-effective.

ENROLLMENT INFORMATION

Johnson College accepts qualified students regardless of race, religion, disability or national origin. Admission to Johnson College is based on an evaluation of the applicant's desire, ability, and potential for success. Applicants will be judged not only on their scholastic achievement and abilities, but also on their intellectual, physical, emotional and behavioral capacities to meet the essential requirements of the school's curriculum. The College reserves the right to deny admission or re-admission to any student if, in the opinion of the College authorities, his/her admission is not in the best interest of the student or the College. At a minimum, applicants must have a high school diploma, or its equivalent.

Applicants are encouraged to arrange for a campus visit and a personal information session with a Recruitment Advisor. Appointments may also be made to meet with appropriate faculty and current students.

Admission Process

1. Complete the application. Students can apply online at www.johnson.edu. Students may also contact the Enrollment Office at:
Johnson College
3427 North Main Ave.
Scranton, PA 18508
enroll@johnson.edu
570-702-8856
2. The applicant must have the following items sent to the Enrollment Office:
 - Official High School Transcripts from every high school attended or General Equivalency Diploma (GED) (GED policy below)
 - If applicable, an official copy of Scholastic Aptitude Test (SAT) **or** American College Test (ACT) Scores
 - If applicable, an official transcript from each post-secondary institution attended
 - It is strongly recommended that all applicants provide their Recruitment Advisor with any items they believe will provide them with the best opportunity for acceptance (resume, letters of recommendation, certifications, etc. . .)
 - Based on information provided will determine if a placement test is needed.

Note: Admission Requirements for each program area are found on the Enrollment webpage. Health and Animal Science Programs may require additional documentation.

3. The applicant is encouraged to schedule a campus visit, shadow day, or attend an open house event.

Non-Matriculation

A student is considered non-matriculating if they register for courses but have not been accepted into a degree or certificate program. Non-degree seeking/non-matriculating students can enroll in up to 9 credits. Students wishing to obtain more than 9 credits must meet with an enrollment specialist for approval. Enrollment as a non-degree seeking/non-matriculating student does not imply admission to the college.

Non-degree seeking/non-matriculating students do not follow admissions requirements and are not required to take placement testing.

This status is most suited for students seeking personal enrichment, learning/upgrading job skills, seeking degree requirements for another institution, or enhancing a future application for admission into a program of study.

A student wishing to become a matriculating student must follow the admissions requirements and gain acceptance into a degree/certificate program.

For further information regarding registration for non-matriculating students, please contact the Enrollment Office at enroll@johnson.edu.

SOAR (Students Occupationally and Academically Ready)

SOAR stands for *Students Occupationally and Academically Ready*. SOAR programs articulate skills and tasks gained at the high school level to course credit earned in a postsecondary degree, diploma or certificate program.

SOAR programs can help students:

- Prepare for entering the job market with college and career ready skills
- Choose the best career pathway
- Save money on college tuition
- Save time by not duplicating coursework in college

Qualified SOAR students are eligible to apply for credits up to 16 months after their high school graduation date. **The deadline for an entering student at Johnson College to submit their SOAR paperwork is August 1st for fall semester or December 1st for spring semester.** If SOAR credits are awarded they will be placed on the student transcript with a letter grade of “T”.

In order for SOAR credits to be evaluated by the Office of the Registrar, the SOAR Documentation Checklist should be fully completed and sent from the Enrollment Department to the Office of the Registrar. The documents needed to complete the checklist are as follows:

1. Official high school transcript with GPA of 2.75 or higher
2. High school diploma
3. [Perkins Statewide Articulation Agreement Coversheet](#)
4. [Perkins Secondary Competency Task List](#) with the signature of your high school technical instructor

5. **Pennsylvania Skills Certificate** or the Pennsylvania Certificate of Competency earned in your technical program

More information can be found at: <https://www.pacollegegetransfer.com/PASOAR/tabid/4498/Default.aspx>

Dual Enrollment

As defined by the Pennsylvania Department of Education, “dual enrollment, referred to as ‘concurrent enrollment’ in the School Code, is an effort by the Commonwealth to encourage a broader range of students to experience postsecondary coursework and its increased academic rigor, while still in the supportive environment of their local high school. The intent is to increase the number of students that go on to postsecondary education and to decrease the need for remedial coursework at postsecondary institutions.”

It is a “locally administered program that allows a secondary student to concurrently enroll in postsecondary courses and to receive college credit for that coursework. The local programs are run through partnerships between school entities and eligible postsecondary institutions.” For information about dual enrollment opportunities, please contact the Enrollment Office at enroll@johnson.edu.

Early College Program

The Industry Fast Track (IFT) program is a joint partnership with area school districts and Johnson College. Industry Fast Track offers high school students an opportunity to enroll simultaneously in secondary and post-secondary coursework at Johnson College. Students will remain enrolled full-time at their high school while attending classes at Johnson College.

The number of Johnson College credits an IFT student can enroll in each academic term is dependent on course availability and the student’s term and cumulative GPA at Johnson College.

- At least 2 program (non-general education/core career) courses will be available to IFT students each semester (either online or in-person).
- When a student’s term and cumulative GPA is 3.0 or better they can register for any number of credits per academic term.
- When a student’s term or cumulative GPA is between 2.0 and 2.99, they can register for up to 12 credits the following academic term.
- When a student’s term or cumulative GPA is below a 2.0, they are placed on academic probation, can register for up to 6 credits the following academic term, and must earn at least a 3.0 GPA the following academic term to stay in the program.

Pre-Employment Transition Service (PETS) Program

<https://johnson.edu/pets/>

The PETS program is a paid employment transition opportunity for high school students with an open case with Office of Vocational Rehabilitation who have a post-secondary goal of employment. PETS give students the opportunity to train for potential full-time employment. The training period is flexible based on the student's skill level and career interest in Warehouse Associate or Building Finisher positions.

Readiness in Skilled Employment (RISE) Program

<https://risenepa.org/>

RISE helps individuals rise improve their socio-economic standing through gaining skills that help them qualify for skilled employment. RISE is a program like no other for individuals seeking a life-changing job opportunity. This workforce development program is available to Pennsylvania's Lackawanna and Luzerne County residents, and offers much more than technical training. RISE participants will receive career coaching, assistance with gaining soft-skills, and a range of support along the way to ensure academic success and job placement.

We understand that stress, health, and money are just some of the barriers that can impact participation and commitment to earning an education. RISE is here to help to remove those barriers. We assist our participants with transportation, childcare, housing, technology and language, to name a few. By providing pathways to earning a family-sustaining wage, RISE helps to break the cycle of poverty and paves the way for future generations to succeed!

Parent Pathways of NEPA Program

<https://parentpathwaysofnepa.org/>

Parent Pathways of NEPA is a multi-sector collaborative, including higher education, social and community services, and youth development. This holistic approach to removing barriers for parents so they can advance their education. Parent Pathways of Northeastern Pennsylvania guides parents out of poverty through access to higher education and family sustaining professional careers. Families are empowered to learn, thrive, and succeed; two generations at a time. The program drives equitable access to higher education for student parents in a collaborative place; where empathy and empowerment meet.

- Compassionate Responders
- Holistic Access
- Person-Centered Strategies
- Multi-Sector Integration
- Two-generation Focus

***Distance Education/ Hyflex Learning in Wayne, Pike, & Susquehanna
Counties***

<https://johnson.edu/distance-learning-program/>

Enrolled students will have interactive, two-way access to Johnson College faculty and will participate in remote education, discussions, testing, and skill demonstrations via high-tech telecommunications equipment in classrooms at Forest City Regional High School, Honesdale High School, Wallenpaupack Area High School, and Western Wayne High School. The program creates a direct route to career technology education (CTE), a college degree, and ultimately a fulfilling career with family-sustaining wages for students in rural Northeastern Pennsylvania.

TUITION, FEES, EXPENSES

The following tuition and fees are for the 2023 - 2024 academic year. The College reviews tuition and fees annually and reserves the right to adjust fees when necessary.

Application Fee

A fee is required for every online application. This fee is refundable only if a student cancels the application within three days of payment.

Tuition Deposit

Accepted students must submit a deposit within 30 days of receipt of an acceptance letter. This deposit is required prior to registration and is credited to the student's tuition account.

Tuition

Tuition for full-time attendance (12 to 20) credits per semester, 24 to 40 credits per academic year) for the 2023-2024 academic year is \$18,408. The per credit tuition rate of \$575 will be assessed for each approved credits over 20 per semester.

Tuition for part-time attendance (fewer than 12 credits per semester) is based on the number of credits for which a student registers. The per credit tuition rate is \$575. Fees for part-time students (fewer than 12 credits per semester) are prorated based on the number of credits per semester for which a student registers.

Books & Supplies

Books and supplies will cost approximately \$1,500 - \$2,000 per academic year; this amount may vary substantially depending on the program in which a student is enrolled.

Annual Student Fees

Administrative Fees

Returned Check	\$30
Official Transcript	\$10
Unofficial Transcript	\$5
Late Registration	\$50
Challenge Exam	\$575

Program Fee – CCM, HVAC, ECM, BPM, AMT	\$1,000
Program Fee – RAD, VET, & PTA	\$1,500
Program Fee – WTC, WFMT, AMT, AVT	\$1,400
Program Fee – ADT, CDT	\$1,000
Program Fee – DTT, DPMT, HET, AUT	\$1,000
Program Fee – CIT, EET, MEC & BET	\$1,000

Technology & Facilities Fee

\$1,500

Graduation Fee*

\$200 (Sophomore Only)

*Regardless of number of credits registered, students will be billed 100% for graduation fees.

Medical Inoculations

Information on medical inoculations for Biomedical Equipment Technology, Physical Therapist Assistant, Radiologic Technology, and Veterinary Technology is found in the respective program area. These costs vary for each program based on the type and fee for each clinical experience.

Senior Testing Fees

Seniors in their last semester of education in Automotive, Diesel Truck, HVAC, Welding, Aviation, and Heavy Equipment programs will be charged a testing fee that is required for industry certification. Fee costs will be reflected on the most current College Catalog for that academic year.

Refund and Adjustment of Charges

Students who officially withdraw from their programs of study at Johnson College may be eligible for an adjustment of tuition charges and fees. Adjustments are based on the official date of withdrawal or the last day of documented class attendance, as determined by the Office of the Registrar.

Tuition Adjustment

Students who withdraw or are terminated from Johnson College during the semester will be entitled to an adjustment of tuition and fees according to the following schedule:

Withdrawal:	Adjustment:	Withdrawal:	Adjustment:
First week	100%*	Third week	25%
Second week	50%	After third week	0%

*See Application of Policy (1).

Johnson College institutional grants, PHEAA grants, and scholarship funds awarded to students who withdraw or are terminated may be adjusted according to the same schedule. Federal aid and/or state grant assistance (such as Pell and/or PHEAA) and/or institutional assistance from Johnson College may not cover all unpaid institutional charges due the College upon the student’s withdrawal. In such cases, students will be billed for remaining balances.

State Guidelines

Pennsylvania and other state grants will be adjusted in accordance with the agencies’ stated guidelines. PHEAA Grant funds may be reduced by the same percentage as the tuition reduction received by students who withdraw from their programs of study. However, it should be noted that PHEAA reserves the right to make the final decision on the percentage of the reduction.

FINANCIAL AID

Financial aid helps meet college costs, both educational (tuition and fees,) and living (food, housing, and transportation) for those who qualify. Through various programs offered by state and federal governments, as well as private lenders, financial aid helps the cost of education become affordable.

Several forms of financial assistance are available to students who qualify. Participation in programs funded by state and federal agencies requires the Financial Aid Office to comply with the regulations set forth by each agency concerning student eligibility and academic progress standards. This will generally require the completion of the Free Application for Federal Student Aid (FAFSA). <https://fafsa.ed.gov> All students are required to complete a FAFSA or sign a FAFSA waiver form when other funding sources exist.

Responsibility for financing an education rests first with students and their families. Financial aid should be viewed as supplementary, to be used only after the full resources of students and their families are committed.

Eligibility

Each funding source has its own eligibility requirements. More information is available through the Financial Aid Office.

Grants

- Federal Pell Grant*
- Federal Supplemental Educational Opportunity Grant (FSEOG)*
- PHEAA Grant (Pennsylvania Higher Education Assistance Agency)*
- Johnson College Institutional Grant*

Loans

- Federal Direct Subsidized Student Loan*
- Federal Direct Unsubsidized Student Loan
- Federal Direct Parent Loan for undergraduate Students (PLUS)

**Indicates need-based aid to eligible students*

Federal Guidelines for Financial Aid

In accordance with federal regulations, students who receive federal financial aid and withdraw from Johnson College during the first 60% of a semester will have their federal financial aid adjusted based on the percentage of the semester completed prior to the withdrawal. Students will be entitled to retain the same percentage of the federal financial

aid received as the percentage of the semester completed. This percentage is calculated by dividing the number of days in the semester (excluding breaks of five days or longer) into the number of days completed prior to the withdrawal (excluding breaks of five days or longer). The date of withdrawal will be based on the official date of withdrawal or the last day of documented class attendance as determined by the Registrar.

Once the amount of federal funds to be returned has been calculated, the funds will be returned in the following order:

- Unsubsidized Federal Direct Student Loans
- Subsidized Federal Direct Student Loans
- Federal Direct Parent Loan for Undergraduate Students (PLUS)
- Pell Grants
- Federal Supplemental Educational Opportunity Grants (FSEOG)

The amount to be returned to a specific federal program may not exceed the total amount awarded from that program.

First-year, first-time borrowers who withdraw before the 30th calendar day of the program of study are prohibited from receiving Federal Direct Student Loan funds (Unsubsidized Direct Loans and Subsidized Direct Loans) at the time they withdraw.

Further information about refunds of financial aid may be obtained from the Financial Aid Office.

Student Employment

Students who are interested in employment may obtain further information from the Financial Aid Office. Federal Work-Study: a federally-funded employment program that provides supplemental assistance to students who demonstrate financial need. Students participating in the Federal Work-Study program will be required to perform community service hours at an off-campus location in the academic year in which they receive federal funds.

Satisfactory Academic Progress (SAP)

Students attending Johnson College who wish to be considered for Federal Title IV (*Pell Grant, Federal Supplemental Educational Opportunity Grant (FSEOG), Federal Work-Study, Direct Student Loan, or Direct Parent PLUS Loan*) and institutional aid, in addition to meeting other eligibility criteria, must maintain satisfactory academic progress (SAP) in the course of study being pursued. The college is required to establish a SAP standard in accordance with U.S. Department of Education regulation 34 CFR 668.34. This SAP Policy is as strict as or stricter than academic policies for students who are not receiving Title IV Aid. Students' academic records will be reviewed at the end of each enrolled term (i.e., fall semester, spring semester, and summer session) after grades are calculated by the Registrar's Office. All semesters in which the student is enrolled,

including summer, must be considered in the determination of SAP, even semesters for which the student did not receive federal financial aid. Students who fail to meet minimum SAP standards will be notified via Johnson College email and US mail once the determination has been made.

Satisfactory Academic Progress Minimum Standards

SAP is measured on three standards: Completion Rate (CR), Cumulative Grade Point Average (CGPA), and Maximum Time Frame (MTF). Students requesting consideration for federal financial aid must demonstrate a positive forward movement toward their degree and must meet the following standards.

Minimum SAP Standards	
CR	67%
CGPA	2.0
MTF	Total credits attempted cannot exceed 150% of program length.

Completion Rate (CR)

Completion Rate is a quantitative measurement of your progress towards graduation. In order to complete your program in a timely manner you must complete a certain percentage of the credits that you attempt.

Attempted credits include all course credits in which the student remains enrolled past the last day of the Add/Drop period. Included in the number of attempted credits are F (fails), R (repeats), SA (administrative withdrawals), and W (withdrawals). SA and W credits are considered attempted and unearned. Credits transferred into Johnson College are considered attempted and earned. Developmental courses are counted as hours attempted and, if successfully completed, hours earned.

To calculate $CR = \frac{\text{Cumulative number of credits that you have successfully completed}}{\text{Cumulative number of credits that you have attempted}} = \%$

Examples:

Undergrad. degree	$\frac{12 \text{ earned}}{18 \text{ attempted}} = 67\%$	Successful CR	Undergrad. degree	$\frac{9 \text{ earned}}{18 \text{ attempted}} = 50\%$	Unsuccessful CR
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Cumulative Grade Point Average (CGPA)

Your CGPA is a qualitative measurement of your academic achievement. All students must maintain the minimum CGPA of 2.0 set forth in this policy. Credits that are not calculated into the SAP CGPA include I (incompletes), W (withdrawals), and transfer credits.

Maximum Time Frame (MTF)

The Maximum Time Frame (MTF) cannot exceed 150% of the program length. Full-time students should earn approximately 15 credits a semester in order to stay on MTF. Developmental courses are counted as hours attempted and, if successfully completed, hours earned. Credits earned are counted toward academic progress but do not count towards a degree. Therefore, these credits will be excluded from the MTF requirement. Total credits for MTF cannot be rounded up or down. To calculate MTF multiply program length x 150%.

Examples:

Program	Program Length	MTF
Welding Certificate	30	45
Advanced Manufacturing Technology	66	99
Radiologic Technology	71	109.5

Repeat Coursework

Financial aid is available for the first repeat of any previously passed course. Financial aid is available for each attempt of a previously failed course. However, each attempt is considered into the CR and MTF.

*Audited classes are not counted into CGPA and MTF.

Consecutive Enrollment

If a student fails to meet the CGPA or CR requirements for two (2) consecutive terms, whether or not they are receiving financial aid, they will be considered to have unsatisfactory academic progress (USAP). This status will result in a USAP suspension and loss of their financial aid eligibility. Students who exceed Maximum Time Frame will have USAP suspension immediately.

Change of Major

The first time a student changes their Major program of study, the courses that pertain to the previous major are not included in the SAP calculation. However, all courses that fulfill requirements for the new major are used in the SAP calculation. Subsequent changes to a student's major ARE calculated into Satisfactory Academic Progress.

Second Certificate or Degree

If a student enrolls for a second certificate or degree, after completion of a certificate or degree, the student may be eligible for an additional 150 % Maximum Time Frame of financial aid for their new program of study. This will be determined based upon compliance of ALL other federal regulations.

Unsatisfactory Academic Progress (USAP)

Failure to meet satisfactory academic progress (SAP) requirements set forth by Johnson College in accordance with federal regulations result in unsatisfactory academic progress (USAP).

USAP Statuses:

Failure to meet satisfactory academic progress (SAP) requirements set forth by Johnson College in accordance with federal regulations result in unsatisfactory academic progress (USAP).

USAP Statuses

USAP Warning Status

You will be placed on a USAP Warning the first time you do not meet SAP standards. This means you are one enrolled term away from losing your financial aid eligibility. You still have financial aid eligibility for one enrolled term to meet SAP standards.

USAP Suspension Status

If you are placed on a Warning and, at the end of the next term you have not met the SAP standards you placed on USAP Suspension. You will not receive federal or institutional financial aid. You may appeal this status.

USAP Probation Status

If you have successfully appealed a Suspension, you will be placed on USAP Probation for one enrolled term. If you meet the SAP standards at the end of the Probation term, your SAP Status will be considered met and you will no longer be considered USAP. If you do not meet the SAP standards at the end of your Probation, you will be placed back into USAP Suspension.

USAP Academic Plan Status

If you have successfully appealed a USAP Suspension by completing the Unsatisfactory Academic Progress Appeal Form, you may be placed on an Academic Plan. You must successfully follow your SAP Academic Plan while in this status. You will be monitored by the Financial Aid Office at the end of each term. If you do not meet the criteria outlined in your SAP Academic Plan, you will be placed back into Suspension. If you are meeting the criteria outlined in your SAP Academic Plan, you will remain in this status until either the plan expires or you are meeting SAP standards.

If you meet SAP standards while on Probation or while on your SAP Academic Plan, your SAP Status will be considered met for the next term.

If you do not meet SAP standards and your SAP Academic Plan expires, you will need to submit a new USAP Appeal in order for your aid eligibility to be re-reviewed.

REINSTATEMENT OF FINANCIAL AID ELIGIBILITY

If you lose federal and institutional aid eligibility because you are not meeting the SAP Cumulative GPA or Completion Rate standards, you may regain eligibility in one of the following ways:

1. Submit an Unsatisfactory Academic Progress (USAP) Appeal Form with supporting documentation. That form provides a non-exhaustive list of circumstances for which you may appeal. You must advance toward attaining a degree and show progress within your SAP Academic plan for graduation.
2. Attend Johnson College using your own resources. You must advance toward attaining a degree and adhere to SAP Standards. You must contact our office after grades have been posted by the Registrar's Office in order for your financial aid to be reviewed for reinstatement.

If you lose federal and institutional aid eligibility because you are not meeting the SAP Timeframe standard, you must submit a USAP Appeal Form for approval in order to regain eligibility.

Once you regain eligibility, you will be awarded financial aid subject to your financial aid eligibility and the availability of funds.

If you lose federal and institutional aid eligibility because you are not meeting the SAP Cumulative GPA or Completion Rate standards, you may regain eligibility in one of the following ways:

1. Submit an Unsatisfactory Academic Progress (USAP) Appeal Form with supporting documentation. That form provides a non-exhaustive list of circumstances for which you may appeal. You must advance toward attaining a degree and show progress within your SAP Academic plan for graduation.
2. Attend Johnson College using your own resources. You must advance toward attaining a degree and adhere to SAP Standards. You must contact our office after grades have been posted by the Registrar's Office in order for your financial aid to be reviewed for reinstatement.

If you lose federal and institutional aid eligibility because you are not meeting the SAP Timeframe standard, you must submit a USAP Appeal Form for approval in order to regain eligibility.

Once you regain eligibility, you will be awarded financial aid subject to your financial aid eligibility and the availability of funds.

Veteran Beneficiaries

The law requires that educational assistance benefits to veterans and other eligible persons be discontinued when the student ceases to make satisfactory progress toward completion of his or her training objective. Benefits can be resumed if the student re-enrolls in the same educational institution and in the same program. In other cases, benefits cannot be resumed unless the VA finds that the cause of the unsatisfactory attendance, conduct or progress has been removed and the program of education or training to be pursued by the student is suitable to his or her aptitudes, interests, and abilities.

Any veteran or dependent of a veteran will follow the same Academic Progress Policy as those students who utilize Title IV aid. However, if a veteran or a dependent of a veteran are placed on probation or dismissed from the College, the SCO will notify the VA via VA-Once. Academic progress is checked at the end of each semester and the student will be notified via email of their status.

Industry Tuition Reimbursement Plans

Many companies provide their employees with reimbursement for education expenses. Students should consult their employer for further information. Arrangements for this type of payment should be set up with the Student Business Office prior to the start of classes.

Scholarships and Merit Awards

Johnson College offers a variety of scholarships to meet the financial needs of new and returning students. These awards may be based on financial need, community commitment, and/or academic standing. Each scholarship has specific criteria. For the most up-to-date scholarship information, please visit our website at:

<http://www.johnson.edu/prospective-students/financial-aid/scholarships>

The scholarship application, which consists of four questions can be submitted online, via email, in person, or by US mail. Please be sure to follow the instructions carefully. Each part of the application is reviewed and critiqued by Johnson College's Scholarship Committee. *Any student who submits a scholarship application who has not completed a FAFSA will not be taken into consideration for a scholarship until the FAFSA is completed.*

Applicants will receive a notification letter from the Financial Aid office indicating receipt of their application, and the timeframe in which it will be reviewed by the scholarship committee. ***Priority deadline for current/returning Johnson students is May 1st.*** Upon review by the committee, all submissions will receive a response. Recipients will be required to attend the annual scholarship breakfast and to send the donor of their scholarship a thank you letter.

Award amounts for endowed scholarship funds are determined annually according to earnings on the funds and in accordance with Johnson College policies.

VA Pending Payment Compliance

In accordance with Title 38 US Code 3679 subsection (e), this school adopts the following additional provisions for any students using U.S. Department of Veteran Affairs (VA) Post 9/11 G.I. Bill® (Ch. 33) or Vocational Rehabilitation and Employment (Ch. 31) benefits, while payment to the institution is pending from the VA. This school will not:

- Prevent the student's enrollment;
- Assess a late penalty fee to;
- Require student secure alternative or additional funding;
- Deny their access to any resources (access to classes, libraries, or other institutional facilities) available to other students who have satisfied their tuition and fee bills to the institution.

However, to qualify for this provision, such students may be required to:

- Provide Chapter 33 Certificate of Eligibility (or its equivalent) or for Chapter 31, VA VR&E's contract with the school on VA Form 28-1905 by the first day of class.

Note: Chapter 33 students can register at the VA Regional Office to use E-Benefits to get the equivalent of a Chapter 33 Certificate of Eligibility. Chapter 31 student cannot get a completed VA Form 28-1905 (or any equivalent) before the VA VR&E case-manager issues it to the school.

- Provide Written request to be certified

§3679. Disapproval of courses

(a)(1) Except as provided by paragraph (2), any course approved for the purposes of this chapter which fails to meet any of the requirements of this chapter shall be immediately disapproved by the Secretary or the appropriate State approving agency. An educational institution which has its courses disapproved by the Secretary or a State approving agency will be notified of such disapproval by a certified or registered letter of notification and a return receipt secured.

(2) In the case of a course of education that would be subject to disapproval under paragraph (1) solely for the reason that the Secretary of Education withdraws the recognition of the accrediting agency that accredited the course, the Secretary of Veterans Affairs, in consultation with the Secretary of Education, and notwithstanding the withdrawal, may continue to treat the course as an approved course of education under this chapter for a period not to exceed 18 months from the date of the withdrawal of recognition of the accrediting agency, unless the Secretary of Veterans Affairs or the appropriate State approving agency determines that there is evidence to support the disapproval of the course under this chapter. The Secretary shall provide to any veteran enrolled in such a course of education notice of the status of the course of education.

(b) Each State approving agency shall notify the Secretary of each course which it has disapproved under this section. The Secretary shall notify the State approving agency of the Secretary's disapproval of any educational institution under chapter 31 of this title.

(c)(1) Notwithstanding any other provision of this chapter and subject to paragraphs (3) through (6), the Secretary shall disapprove a course of education provided by a public institution of higher learning if the institution charges tuition and fees for that course for covered individuals who are pursuing the course with educational assistance under chapter 30, 31, or 33 of this title while living in the State in which the institution is located at a rate that is higher than the rate the institution charges for tuition and fees for that course for residents of the State in which the institution is located, regardless of the covered individual's State of residence.

(2) For purposes of this subsection, a covered individual is any individual as follows:

(A) A veteran who was discharged or released from a period of not fewer than 90 days of service in the active military, naval, or air service less than three years before the date of enrollment in the course concerned.

(B) An individual who is entitled to assistance under—

(i) section 3311(b)(9) of this title; or

(ii) section 3319 of this title by virtue of the individual's relationship to—

(I) a veteran described in subparagraph (A); or

(II) a member of the uniformed services described in section 3319(b) of this title who is serving on active duty.

(C) An individual who is entitled to rehabilitation under section 3102(a) of this title.

(3) If after enrollment in a course of education that is subject to disapproval under paragraph (1) by reason of paragraph (2)(A), (2)(B), or (2)(C) a covered individual pursues one or more courses of education at the same public institution of higher learning while remaining continuously enrolled (other than during regularly scheduled breaks between courses, semesters or terms) at that institution of higher learning, any course so pursued by the covered individual at that institution of higher learning while so continuously enrolled shall also be subject to disapproval under paragraph (1).

(4) It shall not be grounds to disapprove a course of education under paragraph (1) if a public institution of higher learning requires a covered individual pursuing a course of education at the institution to demonstrate an intent, by means other than satisfying a physical presence requirement, to establish residency in the State.

STUDENT SERVICES

Student Handbook

The Johnson College **Student Handbook** is accessible through the Johnson College student portal via a link in the Student section. The handbook is available to all students to explain assistance, regulations, organizations, and facilities. Johnson College adheres to a strict disciplinary sanction policy for violations of the campus rules and/or regulations. Students may reference this sanction policy in the Johnson College Student Handbook. It is the responsibility of the student to read the Handbook entirely and to comply with all regulations.

Resource Center

The Johnson College Resource Center, located in the Moffat Student Center, complements the curriculum of both the academic and technology areas. The collection offers students the resources necessary to research trade and technical issues that pertain to their fields of study. The Resource Center also provides the use of online computer services, course reserves, current textbooks, daily newspapers, wireless access, and black and white/color printing. Computers are equipped with the latest available Microsoft Windows and Office Suite. Areas for traditional, relaxed, and group study are available.

For a full list of databases, please see the Resource Center website. In addition, Johnson College holds a partnership with the Scranton Public Library, one of the six libraries making up the greater Lackawanna County Library System. For more information on services provided via this partnership, contact the Resource Center.

Digital Bookstore

All Johnson College students are automatically enrolled in the All Access Textbook program (with the exception of intersession and summer courses). All required books will be digitally linked in D2L and eligible for access the first day of classes (physical textbooks will be provided when digital books are unavailable).

Students who prefer a physical copy of their digital textbook have the option to purchase or rent new or used text materials, on their own, from any vendor they choose. eCampus is one such option and can be accessed by visiting <https://jc.ecampus.com/>. Any questions regarding your on-line purchases can be directed to the Resource Center located in the Moffat Student Center.

Tutoring

Professional tutoring opportunities are available for general education and program area courses. Appointments are offered in both one-on-one and group sessions. Walk-in hours are also offered. Students can sign up for tutoring using the following link: <https://portal.johnson.edu/ICS/Students/Forms.jnz>

Fitness Center

The Fitness Center at Johnson College is available free of charge to current students, faculty and staff. Located in the Moffat Student Center, the Fitness Center houses

cardiovascular equipment machines, free weights, and more. The hours of operation are posted per semester. The Fitness Center is closed on official college holidays.

Gymnasium

The Gymnasium, located in the Moffat Student Center, is available to all current students, faculty and staff upon the facility's availability for "open gym." During open gym students, faculty and staff have the ability to participate in activities. Basketballs are available at all times and other equipment is available upon request via the office of Student Success. Only sneakers or rubber-soled athletic shoes may be used on the gym floors.

Cafeteria Area

There is a self-serve kiosk, located on the Moffat Student Center with a wide assortment of food and snacks available. The self-service kiosk accepts credit/debit cards. Students can add money to a reloadable card (available at the kiosk), or download the Avanti Markets app to manage funds and pay directly from the app.

Career Services

Johnson College's Career Services department works with students to develop the skills necessary for a successful career by assisting them through their real-world internship experience and search for employment.

Career Services hosts résumé workshops, visits classes, and meets with students one-on-one to help prepare job application materials such as cover letters and résumés. Career counseling and interview skills are also available to students and alums.

Students and alums are notified about job openings through various methods including job boards, email notifications, and posts to the Johnson College Student/Alumni Group on LinkedIn. Career Services offers alum job placement assistance for life!

Career Services and the College's industry partners are constantly communicating to find ways to help students and alums find successful careers. Industry partners engage with students by presenting their organization, internship opportunities, and employment opportunities during class presentations and at the College's career fairs that occur in the fall and spring semesters.

Counseling Services

The mission of Counseling Services at Johnson College is to assist students who may be experiencing social, personal, or academic challenges. These services include individual sessions to students as well as psychoeducational programming and outreach. Faculty or staff members may refer students for counseling or students may self-refer. All supportive counseling services on campus are free and confidential. In some cases, the counselor may decide that a student's needs would be best met through a community agency. Referrals to off-campus counseling/agencies may be made if a student's needs exceed the supportive services or go outside of our scope of practice that we provide on campus.

Disability Services

The mission of Disability Services at Johnson College is to provide equal access opportunities, including the establishment and coordination of appropriate accommodations, auxiliary aids and programs to qualified students in accordance with Section 504 of the Rehabilitation Act of 1973 and Americans with Disabilities Act of 1990 as amended by the ADA Amendments Act of 2008. The office exercises a reasonable good faith effort to coordinate accommodations designed to enable students with permanent or temporary disabilities to maximize their educational potential. Students must contact the Counselor/Manager of Disability Services to find out what documentation may be required to substantiate the need for accommodations and to make a request for accommodations. Please refer to the Policies and Procedures section of the Student Handbook for additional information or contact the Counselor/Manager of Disability Services by phone at (570) 702-8956.

Deaf / Hard of Hearing- Students requesting a sign language interpreter should contact the Counselor/Manager of Disability Services as soon as they are accepted to the college. Policies for students utilizing sign language interpreting services can be found in the Policies and Procedures section of the Student Handbook.

Academic Advising

Academic advising is a collaborative relationship between a student and an academic advisor. Academic advisors promote student success by providing ongoing academic support and by connecting students with any and all campus resources that may aid them throughout their educational experience. This assistance begins the moment the student is accepted into the college and remains steadfast through the day of graduation. In order to facilitate personal growth, academic advisors work diligently to encourage a sense of student responsibility and independence. In order to accomplish this, the advisor/student partnership requires the active participation and involvement of both parties. Clear responsibilities exist for each party and are detailed below.

A key tenet of academic advising is that the student is responsible for their own decisions. Academic advisors exist because students require information and assistance to navigate and make appropriate decisions. The student's role is to explore academic, career, and personal goals.

Advisor Responsibilities

- Understand and effectively communicate the curriculum, graduation requirements, and college policies through use of the course catalog and student portal
- Encourage students support students as they gain the skills to develop a clear and attainable educational plan
- Provide students with information about strategies for utilizing college resources and services
- Monitor and accurately document progress toward academic goals and graduation requirements

- Be accessible for meetings via office hours, telephone, email, lab visits, or video conferencing
- Enter advising information into student information system, specifically the classes for which the student was advised to register in the upcoming academic term.
- Maintain confidentiality and adhere to FERPA and institutional guidelines

Advisee Responsibilities

- Schedule appointments with advisor each semester, coming prepared with questions pertaining to academic requirements
- Learn how to use the course catalog and student portal to select courses that fulfill your educational plan
- Keep a personal record of your progress toward meeting graduation requirements
- Communicate frequently with advisor regarding progress, questions, and/or concerns
- Advocate for yourself and accept responsibility for your decisions

Below is a listing of procedures necessary to achieve these goals.

- Meeting with an advisor is a requirement for all students. Students who do not meet with an advisor will have an institutional hold placed on their account. This hold prevents the student from registering until they have met with the advisor.
- The official advising period typically starts in late October (for the upcoming spring semester) and late March (for the upcoming fall semester).
- Registration opens to students in early November (for the upcoming spring semester) and early April (for the upcoming fall semester).
- November registration is broken down into three sections: priority registration (student veterans), sophomore (30 or more credits completed), and freshman registration (less than 30 credits completed).
- April registration is broken down into 2 sections: priority registration (student veterans) and general registration (all other students). Please refer to the academic calendar for specific dates.
- It is the responsibility of the student to ensure they are following the suggested program outline and meeting all program requirements for graduation. Failure to do so may result in extending their program of study.
- Once the registration period is opened, registration is on a first come, first served basis. Therefore, it is in the best interest of the student to complete their registration as quickly as possible.
- If a student has a hold on their account, they would be notified of the hold by the respective department or advisor. The student must satisfy these holds before proceeding with the registration process. Consultation with the advisor may assist on how this can be accomplished.
- The advisor and student should discuss any current courses where the possibility of not obtaining the required grade as per program and college requirements may occur. This discussion will include, but is not limited to, changes to the student's upcoming schedule, overall implications to the student's program of study, and

potential impact on the student's ability to qualify for financial aid based on Satisfactory Academic Progress (SAP).

- Students participating in priority registration will be notified by the Registrar of the time and dates for this registration. It is the responsibility of the student to schedule a meeting with their advisor to discuss classes and to register for classes during the allotted timeframe. Students who do not comply with these procedures will have to register during the general registration period set for all students.
- The advisor will review each student's progress and recommend classes needed to satisfy program requirements.

If the student misses the designated registration period, they still must meet with their advisor. Registration within two weeks of the term start date will be subject to a late fee.

Student Success Office

The mission of the Student Success Office is to develop well-rounded and responsible graduates by engaging our students in recreation, leadership, and social opportunities while providing support in an inclusive environment. New student orientation, student conduct, student organizations and events, recreation, and information regarding off-campus housing are under the supervision of the Student Success Office.

Johnson College offers both on and off campus activities. Examples of student organizations include the Student Ambassador Program and the Student Government Association. Other club opportunities may be available based upon interest and engagement.

More information can be found on the department's website at
<https://www.johnson.edu/current-students/campus-life/>

OFFICE OF THE REGISTRAR

The Office of the Registrar provides student services and support to the Johnson College community with a high degree of integrity by maintaining all student records, reinforcing the College's academic policies, registration & scheduling, and providing referrals & resources for successful academic progression & completion.

The mission of the Office of the Registrar is to provide effective methods facilitating a culture that preserves the values of the College and its community.

Registrar Services

Transcript Requests

Johnson College will provide official transcripts for a fee of \$10 each upon request to current or former students. Official transcripts (bearing the seal of the College and the signature of the Registrar) are sent directly to the educational institutional, agency, or employer indicated by the student. Official transcripts will not be issued unless all financial obligations to the College have been met at the time of the request. Current students have access to their unofficial transcript via the Student Portal.

Johnson College is permitted to withhold official transcripts from former students who have defaulted on a federal Stafford Loan. An unofficial copy of the transcript will be furnished to the former student with the notation "unofficial" stamped on it. Unofficial transcripts may be requested by students for their personal use at a fee of \$5.

To request a transcript, visit the registrar's website at www.johnson.edu/registrar.

Change of Name / Address

The Office of the Registrar must be informed in writing of any changes to a student's personal information, such as name, address, and telephone number. It is the student's responsibility to keep the College informed of any changes to student information. In the event of a name change, legal documentation must be presented along with the Change of Contact form. Please contact the Registrar at registrar@johnson.edu for more information regarding the name change process.

Course Audits

Students may audit a course for personal enrichment or as part of a required lecture/lab course retake due to failure to earn a passing grade in either the lecture or lab course. Students who audit a course attend classes and participate in lectures and/or laboratory activities but are not required to complete assignments or take tests. Students who audit a course will receive a grade of "AU" on their transcript that indicates that no grade or credit has been given for the course. Students who audit a course for personal enrichment will be charged the current rate for credit-bearing courses. Students who are required to audit a course as part of a required lecture/lab course retake due to failure to earn a passing grade will not be charged additional fees for the required audited course. It is at the discretion of the program director to determine whether a student is required to audit a lecture/lab course

retake due to failure to earn a passing grade. Students who seek to audit a course must first speak with their academic advisor for approval. The Registrar's Office will process the audit registration only after approval from the program director for the course which the student plans to audit.

Approval for Off-Campus Study

Johnson College will accept credits from other accredited institutions for courses taken by a current student provided the student receives approval from the appropriate Program Director, the Office of Academics, and/or the Registrar prior to registering for the course and completes the necessary paperwork. The student must also provide the Johnson College Registrar with an official transcript verifying a grade of "C" or higher upon completion of the course. It is the responsibility of the student to ensure official transcripts are forwarded to the Office of the Registrar. Students may not transfer more than six credits in approved off-campus classes. Approval forms may be obtained through the Office of the Registrar or are available on the Registrar's page of the College's website at www.johnson.edu/registrar.

Math Placement Test

A math placement test is required for all students entering the following programs:

- Advanced Manufacturing Technology
- Architectural Drafting & Design Technology
- Biomedical Equipment Technology
- Carpentry & Cabinetmaking Technology
- Civil Design Technology
- Computer Information Technology
- Electronic Engineering Technology
- Mechatronics Technology
- Radiologic Technology
- Veterinary Nursing
- Welding Fabrication and Manufacturing Technology

The results of the math placement test will determine the student's ability to complete 1 or 2 required math courses in their program of study. A minimum score of 80% is required to waive MAT 101- College Algebra I and Trigonometry for students in the listed programs. A grade of "T" will be marked on the transcripts and MAT 101 will be waived for those students who complete the math placement test with a score of 80% or better.

Students in any of the academic programs listed above who do not take the math placement exam prior to the start of their academic program will be required to take all math courses that are listed in their academic plan or take a challenge exam to waive the MAT 101 requirement (see Johnson College Challenge Examination below).

Prior Learning Assessment

Prior Learning Assessment (PLA) is defined as a validated process to evaluate knowledge and skills students gain from life experiences. When these prior learning experiences demonstrate college-level learning and align with college course competencies,

postsecondary institutions may award college credit. Acceptable forms of PLA include, but are not limited to, work and/or military experience. Students wishing to have prior experience evaluated for PLA credit must provide documentation as directed by the Office of Academics and/or the Registrar. This must accompany the PLA form with signatures from the Office of Academics and the Office of the Registrar. (Evaluation of prior learning completed 5 years before the request date is based on review by a the Office of Academics, appropriate faculty, and Office of the Registrar.) The PLA form can be accessed on the Registrar's page of the College's website at <https://johnson.edu/pla-form/>

Credit by Examination

- **AP (ADVANCED PLACEMENT)** - Students who have completed advanced placement courses in high school may be eligible for transfer credit. Students seeking transfer credit from AP courses must provide documentation of scoring a "3" or better on the respective College Board examination prior to enrolling in the course for which the transfer credit is to be awarded. Students will be notified if transfer credit is awarded and the credits will be entered on their transcript as a "T" but not calculated into their GPA.
- **CLEP (College Level Examination Program)** - Students who have completed CLEP exams prior to attending Johnson College should submit their exam scores at the time of application to the College (a scaled score of 50 or higher is required). The appropriate faculty member and the Office of the Registrar will review the test to determine applicability to awarding credit for Johnson College coursework.
- **Johnson College Challenge Examination** - Students, including those with a "deposit confirmed" enrollment status, who believe they have adequate knowledge or skills in a subject area through prior academic coursework, military service, non-credit training, work experience, etc. and who do not have transcripts documenting that learning may be eligible to sit for a Johnson College Challenge Examination. To complete a course under this policy, a student must obtain a Challenge Exam form from the Office of the Registrar then meet with the appropriate academic advisor and/or faculty member for an assessment to determine eligibility. Once approved, the student must obtain authorization from the Chief Academic Officer or VP for Faculty to take the challenge exam. Successful completion of a challenge exam will be identified on the student's transcript as transfer credit for the course which the exam was taken.

Johnson College reserves the right to make an exception to the above policy for students with an "accept" status based on circumstances surrounding that student as discussed with the Chief Academic Officer.

The fee for taking the Challenge Exam is the cost of one credit and must be paid prior to the examination; student must present a paid business office receipt to the exam proctor. The fee will be waived with proof of veteran status. The college will not allow more than three full-course equivalents completed by

Challenge Examination to count toward a degree without approval of the Chief Academic Officer.

More information can be found by visiting the Office of the Registrar's website: www.johnson.edu/registrar/

Credit for Military Experience - Educational Programs

Students who have completed educational programs offered by branches of the American armed services may be granted academic credit for their coursework. Students should submit an official transcript of their coursework as part of the admissions process. Transcripts will be evaluated according to the guidelines stated by the American Council on Education (ACE) Guide to the Evaluation of Educational Experiences in the Armed Services in determining the credit value of learning acquired in military service. Upon review by the appropriate faculty and the Office of the Registrar, credit may be awarded for appropriate learning acquired in military service at levels consistent with ACE Guide recommendations and/or those transcribed by the Community College of the Air Force when applicable to a service member's program of study. Applicants who have served in the armed services must submit a certified copy of form DD-214, Report of Separation. A final determination of transfer evaluation credit is at the discretion of the institution.

Credit for Military Experience - Military Workplace Learning

Johnson College assists service members and veterans to incorporate credits into their degree programs based on collegiate-level learning achieved not only through formal school training but also through occupational experience and nationally recognized non-traditional learning testing programs (see Credit by Challenge Examination).

Johnson College recognizes the value of specialized military training courses. The appropriate faculty and the Office of the Registrar will review and, if appropriate, award credit for Military Occupational Specialties (MOS) and Navy Rates and Ratings as recommended by the ACE Guide to the Evaluation of Educational Experiences in the Armed Services. Students must submit an official transcript of their military training courses for evaluation. A final determination of transfer evaluation credit is at the discretion of the institution.

Transcript Evaluation Procedure

Students looking to obtain transfer credit into Johnson College must submit an official copy of their college transcripts to the Enrollment Office or Office of the Registrar. Coursework previously completed at another regionally accredited institution or through the Prior Learning Assessment process will be evaluated relative to its equivalency to Johnson College courses and to the chosen major of study. The Office of Academics and the Registrar will make final decisions on acceptance of such coursework for transfer credit. Students who wish to transfer courses must follow the procedures below:

- Complete the steps listed under Application Requirements
- Have official transcripts from all previous coursework sent directly to the

Enrollment Office (Registrar's Office for enrolled students). Course descriptions, course syllabus or a catalog may be required.

- The Enrollment Office will forward the official transcripts to the Office of the Registrar for evaluation.

A copy of the evaluation will be provided to the student by Johnson College email within 10 business days upon receipt by the Registrar's Office. The College accepts a maximum of 30 credits from another accredited institution to qualify for an associate's degree and a maximum of 15 credits to qualify for an academic certificate. Only courses completed with a grade of "C" or higher will be considered for transfer credit. (Physical Therapist Assistant and Radiologic Technology courses will be evaluated on a case-by-case basis and will require a grade of "B-" or higher.) Credit requested under PLA format may require an equivalent grade of "B" or higher.

Transfer credit will appear on the student's transcript but only credits from Johnson College will be used in computing the student's Grade Point Average (GPA) and eligibility for academic honors. **It is the responsibility of the student to ensure that all courses have been evaluated prior to registration to avoid duplication of courses. In order for students to have transcripts reviewed for their first semester of attendance, official transcripts must be received by the Registrar no later than August 1st (for fall semester) or December 1st (for spring semester).**

Coursework completed within the past five years will be evaluated according to current standards. Coursework completed more than five years ago will be evaluated on a course by course basis. **Incoming students only have ONE (1) semester to have transcripts reviewed. After their first semester, transcripts will not be accepted for review.**

Registration

The Office of the Registrar will announce the procedures for, and dates of, registration. Students who have outstanding balances will be put on Bursar's Hold by the Student Business Office and will not be permitted to register until the hold is released by the Student Business Office.

All students must meet with their academic advisor prior to registration otherwise they will be placed on an Advising Hold. Students will be given registration access to the Student Portal, which enables them to register online for classes. The complete advising policy can be found in the Student Handbook.

Registration opens one minute after midnight on the designated date of that registration period. Registration closes at 11:59 PM on the closing date of that registration period. Any student who misses this timeline will need to see the Office of the Registrar in order to register for classes.

Students are permitted to attend only those classes for which they have officially registered and paid. It is the responsibility of students to ensure that they are following the suggested program scope and sequence while meeting all program requirements for graduation.

Failure to do so may result in extending their program of study and delaying graduation.

Johnson College reserves the right to cancel a program, course, or section, to change the time of meeting, to subdivide a section, or to combine two or more sections as circumstances may require. Every effort is made to minimize the impact of such changes on students. Students who are involved in a change of schedule should see their academic advisor. The Office of the Registrar will process the changes.

Change of Course Schedule

Voluntary Drop/Add of a Course

After a student is registered, changes to their schedule may be made through the process of adding and/or dropping a course. Students may be admitted to another course or change sections, depending on availability of seats, only during the drop/add period of the academic session (fall, spring, interseesion, summer). The drop/add period occurs during the first calendar week of each academic session, as indicated on the academic calendar. Courses that are dropped during the drop/add period will be removed from the student's transcript. Schedule change (drop/add) forms are available through the Office of the Registrar's website: <https://johnson.edu/change-of-schedule-request/>.

Any change in schedule must first be approved by an academic advisor.

Voluntary Withdrawal from a Course

For fall and spring semesters, from the second week of the semester to the end of the tenth week of the semester, as indicated on the academic calendar, a student-initiated (voluntary) withdrawal from any course will be assigned a grade of "W" (Withdrew). "W" grades are not calculated into the student's Grade Point Average (GPA) but do appear on the student's transcript.

From the eleventh week of the semester to the last day of the course, students are not permitted to withdraw from a class and will receive the grade they earned for the course. For summer and intersession semesters, the period of time to withdraw from a course is the same as the voluntary add/drop period (1 week from the course start date). The withdrawal form is available from the Office of the Registrar's website: <https://johnson.edu/change-of-schedule-request/>.

Change of Major

Currently enrolled students who wish to change their major must complete a Change of Major form and obtain the required approval/signatures as indicated on the form. Forms may be obtained through the Office of the Registrar. Any student who wishes to change their major must first meet with their academic advisor.

Leave of Absence

A leave of absence (LOA) is an official period of time during which a matriculating student is not currently enrolled at Johnson College. Students who wish to pause their academic progression can do so for up to 2 consecutive semesters by taking an LOA. A student may request that an LOA start during the academic term in which the student is currently enrolled, or start the next semester on the academic calendar. In the event a student initiates an LOA during an academic semester, all courses on the student's transcript for that semester will be assigned grades of "W" to indicate a withdrawal from those courses if the leave begins after the course drop period and before the withdrawal deadline (weeks 2-11). Students must complete a LOA request, available on the registrar's website. All LOA requests must be approved by the Chief Academic Officer before implementation.

Withdrawal from Johnson College

Students who wish to exit and not return to Johnson College can withdraw once the following steps are completed:

- Meet with their academic advisor. You may be referred to other student support services.
- Meet with a representative from the Finance Office.
- Complete an official withdrawal form available from the Office of the Registrar's website: <https://johnson.edu/johnson-college-official-withdrawal-form/> or by emailing advising@johnson.edu and meeting with your advisor.

Upon official withdrawal, grades will be recorded on the transcript as "W" (Withdrew). Johnson College does not consider absence from class an official notice of withdrawal. A student who stops attending class without officially withdrawing from the course(s) or institution will receive the grade earned in that course.

Re-Enrollment Policy

Johnson College encourages students to complete their education degrees. To assist students in this endeavor, the College has established the following re-enrollment policy.

In order to be considered for re-enrollment, a student must have been separated from Johnson College for no more than two consecutive semesters, excluding summer and intersession terms, except those students who are going from a non-health related program to a health-related program. Students who have taken an LOA, been suspended, or did not enroll in courses for consecutive semesters are eligible for re-enrollment. Otherwise, the student is considered a new applicant and must contact the Enrollment Department to file a new application for re-admission to Johnson College.

Students wishing to be re-enrolled, as defined above, must meet with their academic advisor prior to registering for classes and have no financial balance and/or any other

obligation due to the College. The cause of the student's separation from Johnson College (LOA, suspension, etc.) may require the student to meet with the Chief Academic Officer and/or Associate Director of Student Success prior to being considered for re-enrollment.

Students who are re-enrolled are required to complete the graduation requirements in effect at the time they first entered Johnson College.

Readmission Policy

Any student who has been separated from Johnson College for more than 2 consecutive semesters, excluding summer and intersession terms, is considered a new applicant and must contact the Enrollment Department to file a new application for re-admission to Johnson College.

A representative from The Office of Academics will make the decision for readmission. Re-admitted students may be enrolled on a probationary status and may be required to complete an academic probation action plan.

Students who are readmitted are required to complete the graduation requirements in effect at the time they re-enter Johnson College. Coursework previously completed will be evaluated to determine if it meets current program requirements. Students who have taken courses at other post-secondary institutions since their last date of attendance at Johnson College must submit official college transcripts of that coursework.

Veterans' Readmission

Johnson College complies with Readmission Requirements for Service Members as outlined in the Higher Education Opportunity Act (HEOA) section 487.

The HEOA provides that an institution may not deny readmission to a service member of the uniformed services for reasons relating to that service. In addition, a student who is readmitted under this section must be readmitted with the same academic status as the student had when the student last attended the institution.

This applies to service in the uniformed services, whether voluntary or involuntary, on active duty in the Armed Forces, including service as a member of the National Guard or Reserve, for a period of more than 30 days under a call or order to active duty of more than 30 days. To view the full act visit: <http://www2.ed.gov/heoa>

Readmission Procedure

- 1) An academic advisor will review all material needed for the readmission process.
- 2) The Student Business Office will determine if the student is in good financial standing with the College.
- 3) Registration of students deemed eligible for readmission will be reviewed by the Chief Academic Officer to determine if there are any stipulations to be added to readmission.

- a. Students eligible for readmission may be required to adhere to a specific academic plan.
- 4) The student must then complete course registration procedures in conjunction with an academic advisor.
- 5) After notification of readmission and any requirements for readmission, the student must meet with the Financial Aid Office to develop a plan to finance their education.

Student Records Maintenance and FERPA

In accordance with the Family Educational Rights and Privacy Act of 1974 (FERPA), student records are maintained in the Office of the Registrar of the College and are available for review by appointment during normal business hours. All documents are the property of Johnson College and may not be copied, duplicated or removed.

Student records may be viewed by College officials with a legitimate educational interest, certain federal and state agencies responsible for enforcement of FERPA, officials of other colleges to which the student has sought enrollment, and accrediting institutions. In the case of a health or safety emergency, parents who claim a student as a dependent for income tax purposes may also view the records. All other requests for student educational records must have the written consent of the student.

FERPA exempts certain records from the individual's examination, as follows:

- financial records of parents
- medical or paramedical records used only for treatment purposes; the individual may have a doctor or other competent professional review these records.
- law enforcement records that are used solely for law-enforcement purposes
- confidential letters of reference submitted prior to January 1, 1975 or letters of reference submitted after January 1, 1975 that were designated as confidential by the student at the time of his/her solicitation or submission.

Student Rights of Privacy and Access

Unless directed by the courts or by determination of a school official that a "need to know" situation exists, information other than "directory information" is not released to a third party without a student's written consent. "Directory information" includes the student's name, address, telephone number, enrollment status, e-mail address, program of study, dates of attendance, participation in activities and sports, honors received, degrees awarded and dates of awarding.

Notification of Rights under FERPA for Postsecondary Institutions

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. These rights include:

1. **The right to inspect and review the student's education records within 45 days of the day the University receives a request for access.** Students should submit to the registrar, head of the academic department, or other appropriate official, written requests that identify the record (s) they wish to inspect. The University official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the University official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.
2. **The right to request the amendment of the student's education records that the student believes are inaccurate or misleading.** Students may ask the University to amend a record that they believe is inaccurate or misleading. They should write the University official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading. If the University decides not to amend the record as requested by the student, the University will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.
3. **The right to consent to disclosures of personally identifiable information contained in the student's education record, except to the extent that FERPA authorizes disclosure without consent.** One exception, which permits disclosure without consent, is disclosure to school officials with legitimate educational interests. A school official is a person employed by the University in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the University has contracted (such as an attorney, auditor, collection agent or official of the National Student Clearinghouse); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

The University may disclose education records in certain other circumstances:

- To comply with a judicial order or a lawfully issued subpoena;
- To appropriate parties in a health or safety emergency;
- To officials of another school, upon request, in which a student seeks or intends to enroll;
- In connection with a student's request for or receipt of financial aid, as necessary to determine the eligibility, amount, or conditions of the financial aid, or to enforce the terms and conditions of the aid;

- To certain officials of the U.S. Department of Education, the Comptroller General, to state and local educational authorities, in connection with certain state or federally supported education programs;
 - To accrediting organizations to carry out their functions;
 - To organizations conducting certain studies for or on behalf of the University;
 - The results of an institutional disciplinary proceeding against the alleged perpetrator of a crime of violence may be released to the alleged victim of that crime with respect to that crime.
4. **The right to file a complaint with the U.S. Department of Education concerning alleged failures by the University to comply with the requirements of FERPA.** The name and address of the office that administers FERPA is: Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue, SW, Washington, DC, 20202-4605
 5. **The University designates the following as public or “Directory Information”:** The student’s name, address, telephone number, email address, dates of attendance, previous institution(s) attended, major fields of study, undergraduate/graduate/full or part time enrollment status, awards, honors, degree(s) conferred (including dates), past and present participation in officially recognized sports and activities, physical factors (height, weight) of athletes, date and place of birth and other similar information.
 6. **Students may restrict the release of “Directory Information”, except to school officials with legitimate educational interests and others as indicated in point #3 above:** To do so, a student must make the request in writing to the Registrar’s Office, Johnson College, 3427 North Main Avenue, Scranton, PA 18508. Once filed, this request becomes a permanent part of the student’s record until the student instructs the University, in writing, to have the request removed.

Release of Directory Information

Johnson College may disclose appropriately designated “directory information” without written consent, unless the student has advised the College to the contrary by signing a Request to Prevent Disclosure of Directory Information. The form is available in the Student Portal.

“Directory information” is defined as a student’s name, address, telephone number, enrollment status, e-mail address, program of study, dates of attendance, participation in activities and sports, honors attained, degrees awarded and dates of awarding.

Johnson College assumes the failure on the part of any student to specifically request the withholding of “directory information” indicates individual approval for the disclosure.

Carl D. Perkins Vocational and Applied Technology Act

The Perkins Grant program is a federal grant that enables Johnson College to provide support services to students who qualify within the program's guidelines. The program includes a comprehensive system of supporting students attending Johnson College Programs.

Any action taken by Johnson College in implementing the Perkins Grant program may be appealed by current students, parents of current students, teachers employed by Johnson College, or local area residents, in writing, to the Director of the Perkins Grant at the address listed below. The appeal must be received in the office of the Director of the Perkins Grant within ninety (90) calendar days from the date the action is taken or announced, whichever occurs first.

The Director of the Perkins Grant will present the written appeal to the Perkins Committee of Johnson College at a session convened within fourteen (14) calendar days from the receipt of the appeal. The Perkins Committee will review the appeal and determine if further action is necessary. The Committee will notify the person(s) in writing within ten (10) days of the Committee's decision.

If the Committee's decision is adverse to the person(s) filing the appeal, the written appeal will be presented to the full Perkins Advisory Board at its next regularly scheduled session. The Board will vote on the action to be taken. A majority of the full Advisory Board will be necessary to reverse the decision recommended by the Executive Committee.

The Director of the Perkins Grant will notify the person(s) of the full Advisory Board's decision in writing within ten (10) calendar days. The next level of appeal is the Commissioner of Post-Secondary Education, Bureau of Post-Secondary Services, Division of Program Services, Pennsylvania Department of Education, 333 Market Street, Harrisburg, PA 17126-0333.

A copy of this procedure will be provided to faculty and staff.

Petitions may be sent to:

Director of the Perkins Grant
Johnson College
3427 North Main Ave
Scranton, PA 18508

Johnson College is an Equal Opportunity / Affirmative Action College.

OFFICE OF ACADEMICS

Length of Programs

The academic year consists of two 15-week semesters (fall and spring) and 3 five-week sessions during winter (intersession) and summer (summer I and II). Programs of degree-based education generally start in the fall semester and run 24 months in length (four semesters totaling 60 weeks) except those which may require summer internships or practicums. Total credit hours and schedule of program may vary by department, including summer session or spring semester starts.

The Building and Property Maintenance Technology, the Diesel Preventative Maintenance Technology, the Industrial Technology, and the Welding Technology certificate programs are 9 months in length.

Student Academic Course Load

A student is considered full-time when registered for a minimum of 12 credits per semester. A student is considered part-time when registered for fewer than 12 credits. A student typically carries 12 to 20 credits in both the fall and spring semesters. An academic overload occurs when a student attempts to register for more than 20 credits in a semester. Students who wish to register for more than 20 credits must have the permission of a Senior Director within the Office of Academics. Students who are granted permission for an academic overload are subject to additional tuition charges.

Credit Hours

The U.S. Department of Education, in 34 CFR Section 600.2, defines “credit hour” as: “...an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates not less than:

- (1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or,
- (2) at least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution, including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.”

The Pennsylvania regulation states, in part, “A semester credit hour represents a unit of curricular material that normally can be taught in a minimum of 14 hours of classroom instruction, plus appropriate outside preparation or the equivalent as determined by the faculty. A quarter credit hour represents a unit of curricular material that normally can be

taught in a minimum of 10 hours or classroom instruction, plus appropriate outside preparation or the equivalent as determined by the faculty.” 22 Pa. Code Section 31.21(b).u

Each course has a credit-hour value based upon the required number of hours per week in the classroom, laboratory, or program area as well as the appropriate number of additional outside work clock hours that support the didactic component of the class.

clock hour = 50 minute period

15 hours of lecture + 30 clock hours of additional outside work = 1 credit

30 hours of lab +15 clock hours of additional outside work = 1 credit

45 hours of internship = 1 credit

Clinical hours = See programmatic handbook

Grading System

Course achievement level, grade point average (GPA), and cumulative grade point average (CGPA) are provided on semester transcripts using the following system:

<u>Letter Grade</u>		<u>Numerical Relationship</u>	<u>Quality Points</u>
A		96-100	4.0
A-		92-95	3.67
B+		88-91	3.33
B		84-87	3.0
B-		80-83	2.67
C+		76-79	2.33
C		72-75	2.0
C-		68-71	1.67
D+		64-67	1.33
D		60-63	1.0
F		0-59	0.0
I*	Incomplete	P	Pass
W	Withdrawal	F	Fail
SA**	Stopped Attending	R	Repeat
NA	Never Attended	SR	Stop Attend Repeat

* A grade of “Incomplete” will be awarded only in exceptional circumstances. A grade of “Incomplete” must be resolved within 10 academic school days of the following fall/ spring term. If the grade is still “Incomplete” beyond this period, the grade will be listed as an “F”.

**A grade of “Stopped Attending” will be assigned when a student does not attend a course for 2 consecutive academic calendar weeks. An SA is calculated into the GPA and CGPA in the same manner as an “F”.

Cumulative Grade Point Average is computed using the following formula:

$$\text{Cumulative GPA} = \frac{\text{total quality points earned per semester(s)}}{\text{total credit hours attempted per semester(s)}}$$

Repeated Courses

Students who earn an SA, F, or withdraw (W) from a course must successfully repeat the respective course if it is a requirement for graduation. The original grade will be replaced with an “R” or “SR” and only the new grade will be used in calculating the student’s GPA and CGPA. A course may be repeated no more than two times for a total of 3 attempts.

Students who earn a grade of SA, F, or withdraw (W) from a course may elect to take the course at another institution and transfer the credit to Johnson College. In this event, the original grade will be replaced with an “R” or “SR” and will be used only in calculating the total number of credits required for graduation. Transfer credit is not used in the calculation of a student’s CGPA. *Students must receive prior approval from the respective program director for all coursework taken at other institutions.* Please refer to the Approval for Off-Campus Study transfer information in the Office of the Registrar section of this catalog for more information.

Students who earn a grade of SA, F, or withdraw (W) from either the lecture or lab component of a concurrent course offering may be required to audit the course component (lecture or lab) they completed successfully.

Criminal Background Check / Drug and Alcohol Screening

All academic programs of study, clinical practicums and internships, as well as potential employers, may require students to complete a criminal background check, child abuse clearance, fingerprinting and/or drug screening. Johnson College is not responsible for the decisions or actions of other institutions or organizations that may result from a student’s failure of a drug screening or background check. Students who fail to report the results of these incidents to the College may be subject to disciplinary action.

The results of a criminal background check will not necessarily preclude admission to Johnson College, however students may not be able to complete their chosen academic program.

Attendance Policy (In-person and online)

While each college develops its own methods for tracking class attendance and defining conditions for excused absences, Johnson College adheres to federal regulations that require verification of class attendance for all students receiving federal financial aid and veteran beneficiaries. These regulations dictate that a student **MUST** attend the classes

for which the student is awarded financial aid. Financial aid may be reduced or cancelled based on student attendance information.

Federal regulations require institutions to report attendance information for students who have stopped attending class or those who never attended. The registrar will be notified by the course instructor through the student portal of any student who has stopped attending class or never attended. Students will be notified via their Johnson College email account when they have been reported as having stopped attending class or never attended. A student who is reported to have never attended class will be removed from the course and the course will be deleted from their transcript. A student who is confirmed to have stopped attending class will be assigned a grade of (SA) for each course they stopped attending.

Students are responsible for understanding and adhering to the following attendance policy:

- Students are required to be present for scheduled instruction whether in a face-to-face or online environment.
- An online student will be considered in attendance if the student submitted at least one graded activity per week (quiz, discussion, or dropbox assignment, etc.).
- Students are required to participate in in-person and online classes.

Students with extenuating circumstances should contact their instructors immediately to discuss their individual situation. Possible excused absences include, but may not be limited to:

- military service,
- bereavement,
- extended illness,
- participation in school function,
- jury duty

Any student missing the equivalent of two consecutive weeks of class may be administratively withdrawn from the course by the Registrar’s Office. The course instructor will initiate the SA process through the Student Portal. Students who are in danger of being assigned an SA grade will be notified by their academic advisor. Students can return to the course, but will be automatically assigned an SA for a second occurrence of two consecutively absent weeks.

class meets	3 times/ week	2 times/ week	once/ week	online
consecutive absences allowed	6	4	2	2 weeks

Students who are administratively withdrawn (assigned an SA) from a class must repeat the class in a subsequent semester in order to meet degree requirements.

Class Cancellation

Except in unusual circumstances, instructors are expected to conduct all classes on the days and times assigned and to teach for the fully-allotted time. If the instructor does not arrive within the first 15 minutes of class time, then class is cancelled.

Weather / Emergency Notifications

When in-person classes are delayed or cancelled because of inclement weather or other emergencies, information can be obtained from the Johnson College website (www.johnson.edu) or by calling the main office line at 570-342-6404 and following the prompts. It is also prudent to watch the local television channels. You also can elect to be notified by text message to your cell phone. For this service, please go to www.johnson.edu/campus-alerts or by texting “essential” to 79516. (Scranton Campus Alerts)

Faculty may require regularly scheduled in-person class meetings and coursework to be completed online when in-person classes are cancelled. Students should communicate with faculty in order to ensure course requirements are completed.

In the event there are multiple cancellations of in-person classes during a semester, the academic calendar may need to be adjusted to add instructional days. Online classes will not be cancelled due to inclement weather. All online coursework will retain their deadlines regardless of weather conditions.

If a technological emergency results in the Desire2Learn server being down, students will be notified through an announcement on the College’s website (www.johnson.edu). Students may sign up for text and/or email notifications at <https://www.johnson.edu/campus-alerts/>. Please note, Desire2Learn is not housed on the Johnson College campus; emergencies on campus will have little to no effect on distance education courses.

Make-up Work

When students are absent or are unable to complete coursework on schedule, they may be permitted to make up lost time and/or missed work in their academic and/or major courses. It is the responsibility of the student to request consideration for make-up work from the instructor.

Late Assignment Policy

Without prior arrangement, late assignments will be accepted with the following conditions:

- a. The final grade of the assignment will be reduced by 10% (e.g.- 10 points out of 100) for each calendar day the assignment is submitted late.
- b. Late work will not be accepted more than 4 days after the due date and will receive a score of 0.

	On Time	1 Day Late	2 Days Late	3 Days Late	4 Days Late	≥ 5 Days Late
Maximum Score	100%	90%	80%	70%	60%	0%

ACADEMIC STANDING

Good Academic Standing

When a student's CGPA and most recent semester GPA are 2.0 or better, that student is in good academic standing. If either the cumulative or current G.P.A. falls below 2.0, the student will be placed on academic probation.

Academic Probation

At the end of each semester, the Office of Academics and the Office of the Registrar will review students' term Grade Point Average (GPA) and cumulative GPA (CGPA) to determine academic status within the College. Students who earn a term GPA or CGPA <2.0 will be placed on academic probation for the following semester.

Students on academic probation must meet with their advisor to discuss their probation prior to the next semester to review and sign their individual Student Probation Action Plan. If needed, a meeting with the student's Program Director will be held to further discuss the student's academic probation. Failure to read and sign the document may result in being held from attending class the next academic term.

At the conclusion of the probation semester, the Registrar and the Advising Team will review the student's progress and determine how to proceed based on:

- 1) academic performance
- 2) adherence to the Student Probation Action Plan

An inability to meet the minimum GPA and CGPA requirements specified above may result in academic termination.

*Health Science (PTA, RAD, & VET) probation policies can be found in programmatic handbooks.

Students who are in danger of not meeting the CGPA requirement are advised to meet first with their academic advisor, then with Financial Aid, and then with the Office of the Registrar to discuss options. Students on financial aid who fail to meet the completion rate (67% of registered courses) and GPA requirements and/or fail to complete their degree within 150% of the program timeframe may jeopardize their financial aid packages. Please refer to Unsatisfactory Academic Progress statuses in the Financial Aid section of this catalog for more information.

Academic Integrity

The faculty and administration of Johnson College have a high regard for the integrity of the educational process; therefore, the college wishes to recognize students not only for their academic skills and dedication, but also according to a code of ethical academic behavior.

Ethical academic behavior includes, but is not limited to:

1. Acting at all times with honesty, integrity, and being trustworthy
2. Accepting responsibility for one's work
3. Identifying contributing members of a group, where group work is authorized
4. Citing references, where reference use is required
5. Submitting work that is the sole creation of the student
6. Never contributing to the academic dishonesty of others

Academic dishonesty refers to the commission of, or contribution to, dishonest acts by those engaged in teaching, learning, research, or related academic activities. Academic dishonesty in any form will not be tolerated. Academic dishonesty includes, but is not limited to:

1. Cheating- When a student attempts to gain an advantage, or get academic credit, in a way that is dishonest, disrespectful, irresponsible, untrustworthy or unfair. Includes copying from another student's work, unapproved collaboration or group work to complete coursework, taking an exam for another student or asking another student to take an exam for you, or using an answer key to complete coursework.
2. Plagiarism- Occurs when you use another person's words, ideas, assertions, data, or figures without acknowledgement of their work. Includes copying and pasting directly from sources (webpages, Wikipedia, blog posts, journal articles or textbooks, Chat GPT or other artificial intelligence tools), quoting a source without appropriate citation, or not paraphrasing and/or citing a source properly.
3. Submitting work which does not cite contributing members of group when working in courses where group work is required
4. Sharing of digital work (flash drives, googledocs, etc.)
5. Facilitating acts of academic dishonesty by others
6. Tampering with the academic work of others

Acts of academic dishonesty will result in any or all of the following penalties:

First Offense: An "F" for the assignment

Second Offense: Automatic failure of the course

Third Offense: Referral to judicial authorities. Penalties imposed by the Office of Academics may include dismissal from the college.

Final Grade Appeals

If a student wishes to question or appeal a final course grade, the student must do so prior to the start of the following fall or spring semester. Communication during the grade appeals process will be made using the Johnson College email system. Students wishing to appeal a grade must complete the following procedure:

1. Contact the instructor for an explanation of the grade determination within 1 week of the final grade being posted. The instructor of the course will review how the grade was determined. If a grade change is warranted, the instructor will complete and submit a grade change form.
2. If not satisfied with the grade and explanation, the student will then appeal to the program director within 1 week after being notified of the instructor's decision. The program director will review the grade determination with the course instructor, then meet with the student to explain the outcome of the appeal.
3. A student who remains unsatisfied with the results of the appeal must, within 1 week after being notified of the Program Director's decision, submit a letter of appeal to the Chief Academic Officer. The letter must include a summary of the meetings with the instructor and the appeal results, as well as a rationale for the appeal. After discussing the appeal with all parties, the Chief Academic Officer will meet with the student to explain the final decision.

Academic Dismissal

Johnson College makes every effort to assist students in achieving their academic goals; however, the College reserves the right to dismiss students due to poor academic performance or violation of academic code of conduct. An inability to meet the minimum CGPA requirement for two consecutive semester may result in dismissal from the college.

In such cases, the Office of Academics will notify students of their dismissal via:

- Letter of dismissal from the Chief Academic Officer

Dismissed students will still be held responsible for all financial obligations.

Academic Dismissal from a Program of Study

The Physical Therapist Assistant, Radiologic Technology, and Veterinary Nursing programs have specific Grade Point Average (GPA) requirements for their major courses. Specific dismissal policies for Physical Therapist Assistant, Radiologic Technology and Veterinary Nursing students can be found in their respective Programmatic Handbooks.

Student Grievance Policy

Johnson College makes every effort to resolve student complaints internally. It is expected that students will fully utilize any and all administrative procedures to address concerns and/or complaints in as timely a manner as possible. The College defines a

grievance as an issue related to a perceived academic or non-academic injustice, whereby a student believes they have been dealt with indiscriminately, unfairly, or in a way that violates established laws, rules, or policies, by an employee of the College.

- **Informal complaint:** Academic and non-academic issue with faculty, staff, administrator, department, program or any other reason.
 - Attempt should be made to resolve issue with parties involved
 - If resolution could not be made informally, a formal grievance may be submitted
- **Non-Academic Grievance:** Official grievance form submitted because the student believes they were treated indiscriminately, unfairly, or in a way that violates rules, policies or procedures, and or any laws.
- **Academic Grievance:** Official grievance form submitted because the student feels they have been harmed by being treated indiscriminately or unfairly within the context of the course.

Informal complaint process

Non-Academic: Initial efforts to resolve the issue with whomever the issue arose with must take place first, if possible (this does not apply to alleged sexual harassment, sexual misconduct, or discrimination). If an informal discussion with the persons involved cannot solve the complaint, a student may submit a formal grievance (online form) no later than thirty (30) business days after the alleged incident. A designated staff/faculty member, as appropriate for the complaint incident, will make every effort to resolve the matter and report the decision, in writing, to the complainant(s) and respond via their Johnson College email address within fourteen (14) business days after receiving the complaint.

Academic: All academic related complaints must be submitted to the instructor/faculty member involved. If an informal resolution cannot be made, the student may submit a formal grievance within thirty (30) days of when the alleged incident occurred. The designated faculty or administrative staff member will make every effort to resolve the matter and report the decision, in writing, to the complainant(s) Johnson College email address within fourteen (14) business days of receiving the complaint.

Formal Grievance

In the event that a complaint cannot be resolved informally, the student may continue the process and submit a formal grievance by completing the Formal Grievance Form, located on the Johnson College website.

Prior to submitting a formal grievance, the complainant(s) must attempt to obtain a resolution through the informal process. A formal grievance must be submitted no later than thirty (30) business days after the decision of informal resolution has been made.

Staff or faculty who have been assigned the Formal Grievance has fourteen (14) business days after receiving the grievance form to report the decision in writing to the complainant(s) email address.

[Submit a formal grievance here.](#)

Appeal

A student may appeal the formal grievance decision within ten (10) business days by submitting a formal appeal in writing, along with the written decision to the **Johnson College Grievance Committee** at grievance@johnson.edu

The following information must be included in the student's email to the Grievance Committee:

- 1) Name and contact information of complainant(s)
- 2) Detailed description of the appeal
- 3) A copy of any documents relating to the complaint, including previous decisions and supporting documents
- 4) Specific reason for the appeal
- 5) Desired outcome
- 6) Date grievance submitted

The committee will have fourteen (14) business days to review the information and notify the complainant(s) of the Committee's decision, in writing, to their Johnson College email address.

All decisions made by the Johnson College Grievance Committee are final. There is no further appeal within the Student Grievance Procedure Policy.

The college is committed to addressing student complaints timely and effectively, in accordance with student complaint/grievance procedures. If a student believes their concerns have not been sufficiently addressed, they may also file external complaints with the agencies identified below.

Student Complaints to the Pennsylvania Department of Education

Students may file a complaint with the [Pennsylvania Department of Education:](#)
Pennsylvania Department of Education – Postsecondary and Adult Education
333 Market Street, 12th Floor
Harrisburg, PA 17126-0333
Phone: 717.783.6788

Student Complaints to the Middle States Commission on Higher Education

Students may file a complaint with the [Middle States Commission on Higher Education,](#) accrediting agency.

Middle States Commission on Higher Education
Telephone: 267-284-5000

Programmatic Complaint Process

[Complaint form for Physical Therapist Assistant](#)

[Process for Reporting Allegations against a JCERT Program](#)

[Process for Reporting Complaints for the Veterinary Technology Program](#)

[Submit a formal grievance here.](#)

Graduation Requirements

Students must meet the following requirements in order to be eligible to graduate from Associate Degree programs:

- Successful completion of First-Year Experience (SSS 101)
- Successful completion of course curriculum as stated in entry to programs, minimum of 60 credits
- Successful completion of a minimum of 30 credits at Johnson College
- Successful completion of clinical/internship for students in the Biomedical Equipment Technology, Physical Therapist Assistant, Radiologic Technology and Veterinary Technology programs
- Refer to the retention section in the respective program areas for Physical Therapist Assistant, Radiologic Technology and Veterinary Technology
- Full payment or satisfactory arrangement to fulfill all financial obligations
- Submission of a completed Graduation Application form by the stated deadline

Students must meet the following requirements in order to be eligible to graduate from a certificate program:

- Successful completion of First-Year Experience (SSS 101)
- Successful completion of course curriculum as stated in entry to programs, minimum of 30 credits
- Completion of a minimum of 15 credits at Johnson College
- Achievement of a cumulative grade point average (CGPA) of 2.00.
- Full payment or satisfactory arrangement to fulfill all financial obligations
- Submission of a completed Graduation Application form by the stated deadline

Students within six (6) credits of completion of their degree may have the opportunity to participate (walk) in commencement ceremony activities. An exception can be made; however, students must register or prove they have registered for the remaining courses necessary to complete their program.

Academic Honors and Recognition

The President's List

The President's List is published at the end of each semester citing students who achieved a minimum 3.90 GPA, while carrying a minimum of 12 Johnson College credits and matriculating toward a degree. Students who receive a grade of "W, F, SA, or I" on their transcript for the semester will not qualify for the President's List.

Honors upon Graduation

Graduating students are eligible for recognition based upon scholastic merit. Highest Honors Awards are conferred on graduates with the highest cumulative GPAs among the candidates for the Associate in Applied Science and the Associate in Science degrees. Students with a minimum CGPA of a 3.0 for credits earned at Johnson College will be eligible for departmental honors.

Citations conferred by the College for exceptional academic achievement and completion of a challenging curriculum are:

- *Summa Cum Laude* \geq 3.9 cumulative GPA with a minimum of 45 credits
- *Magna Cum Laude* \geq 3.8 cumulative GPA with a minimum of 45 credits
- *Cum Laude* \geq 3.7 cumulative GPA with a minimum of 45 credits

Graduation honors are calculated based on grades achieved at the end of the fall semester preceding the May graduation date.

National Honor Societies

Alpha Beta Kappa

Alpha Beta Kappa is a national honor society open to students who attain a cumulative GPA of 3.50 or higher by the beginning of their last semester at Johnson College and who have participated in a student group/organization for at least one semester during their time on campus. Eligible groups/organizations include Student Government Association, and/or serving as a peer tutor, or Ambassador. Peer tutors must tutor a minimum of once a week for at least one semester. Students are inducted into the Omega of Pennsylvania chapter during a ceremony at Awards Night.

National Technical Honor Society

The National Technical Honor Society believes in advocating for all skilled career paths and empowering students in seeking skills, building their careers, and the global workforce. To be considered for membership, students must demonstrate how they went above and beyond to contribute to the Johnson College community outside the classroom. Students are required to have a cumulative grade point average of 3.0 at the end of the semester prior to graduation. Candidates must also demonstrate integrity and leadership by participating in activities around campus and volunteering in campus wide events.

Military Students

Johnson College is a Gold rated Military Friendly school. A Military Friendly rating is given to a School or Organization that has a commitment, effort and success in creating a beneficial environment for the military community. As part of this rating, Johnson College offers priority registration, a private study room, and resources, among other benefits, for Military students. Military students are recognized at Awards Night with an honor stole in representation of their Military Service.

Second Degree

Students who wish to obtain a second degree may do so if they fulfill the following requirements:

- Students are recommended to complete all the requirements of their first degree before starting their second degree program requirements.
- Students must apply for and be admitted into the major program in which the second degree is desired by the Enrollment Department.
- Students must meet all of the curriculum requirements of the first and second degree for both major and required courses.
- Students must meet with their advisor and/or the appropriate faculty member(s) of the second degree program to determine the minimum number of credits that need to be completed for the second degree in addition to the credits taken in the first degree program.

Transfer of Credit to Baccalaureate Institutions

Johnson College has program-specific articulation agreements with the following baccalaureate awarding institutions:

Articulation Agreement	Johnson College Program	Articulated Program	Website
Bloomsburg University	A.A.S Electronic Engineering Technology	B.S. Electrical Engineering	https://www.bloomu.edu/
Keystone College	A.A.S Logistics and Supply Chain Management	B.S. Business Administration	https://www.keystone.edu/
Keystone College	A.S. Computer Information Technology	B.S. Computer Science	https://www.keystone.edu/
Kutztown University	A.S. Computer Information Technology	B.S. Information Technology	https://www.kutztown.edu/
Lackawanna College	A.A.S Logistics and Supply Chain Management	B.S. Business Administration	https://www.lackawanna.edu/

Marywood University	A.S. Computer Information Technology	B.S. Computer Science	http://www.marywood.edu/
Marywood University	A.S. Computer Information Technology	B.S. Information Security	http://www.marywood.edu/
Marywood University	A.S. Veterinary Technology	B.S. Biology	http://www.marywood.edu/
Mount Aloysius College	A.S. Radiologic Technology	B.S. Leadership in Healthcare or Medical Imaging	https://www.mtaloy.edu/
Mount Aloysius College	A.S. Physical Therapist Assistant	B.S. Leadership in Healthcare	https://www.mtaloy.edu/
Pennsylvania College of Technology	A.S. Computer Information Technology	Information Assurance and Cybersecurity	https://www.pct.edu/
Pennsylvania College of Technology	A.S. Radiologic Technology and A.S. Physical Therapist Assistant	Applied Health Studies	https://www.pct.edu/
Pennsylvania College of Technology	A.A.S. Electrical Construction and Maintenance Technology	Building Automation Technology	https://www.pct.edu/
Pennsylvania College of Technology	A.A.S. Carpentry and Cabinetmaking Technology	Residential Construction Technology and Management	https://www.pct.edu/
Pennsylvania College of Technology	A.A.S. Carpentry and Cabinetmaking Technology	Building Science and Sustainable Design	https://www.pct.edu/
Pennsylvania College of Technology	A.A.S. Architectural Drafting and Design Technology	Building Science and Sustainable Design	https://www.pct.edu/
St. Matthew's University	A.S. Veterinary Technology	Doctor of Veterinary Medicine	https://www.stmatthews.edu/

University of
Missouri

A.S. Veterinary
Nursing

B.S.
Veterinary
Technology

<https://missouri.edu/>

GENERAL EDUCATION CURRICULUM

In support of our mission, Johnson College provides every student with an industry-focused educational experience grounded in a general education curriculum that supports critical thinking, makes connections across disciplines, and fosters engagement in the world around them.

The mission of the General Education Curriculum at Johnson College is to provide students with skills needed in the real world to develop professional competency through critical thinking and problem solving, written and oral communication, scientific and quantitative reasoning, technological competency and information literacy, and equity and inclusion.

Johnson College is required to provide general education coursework as part of our associate degree program curricular content. General education requirements are completed as part of core career coursework, which may include courses in the student's major program of study.

Johnson College has identified 10 areas for general education curricular content that must be completed as part of all associate degree programs.

Arts (ART)

Critical analysis and reasoning (CAR)

Humanities (HUM)

Information literacy (IL)

Mathematics (MAT)

Oral and written communication (COM)

Science & scientific and quantitative reasoning (SCI, SQR)

Social sciences (SOC)

Technology & technological competency (TECH, TC)

Values, ethics, and diverse perspectives (VED)

General Education Curriculum Overview

General Education strives to cultivate students' abilities to make an honorable living and become contributing members of society. As an integral part of the entire college experience, General Education provides students with skills, knowledge, and cultural awareness that enable students to succeed in their program courses and their careers.

General Education Curriculum Learning Goals

Learning Goal #1: Critical Thinking and Problem Solving - Graduates will think logically and critically by employing reasoning and analysis.

- Graduates will demonstrate the ability to examine opposing sides of arguments and respectfully present one side of the argument as stronger through the use of facts.

- Graduates will evaluate information and ideas in an organized fashion.
- Graduates will develop new ideas, perspectives, and approaches.
- Graduates will utilize information to react to unintended results professionally in order to achieve the desired outcomes.

Learning Goal #2: Written and Oral Communication - Graduates will develop effective written and oral communication skills.

- Graduates will be able to create items that have introductions, bodies, and conclusions.
- Graduates will be able to create thesis statements and topic sentences.
- Graduates will demonstrate the ability to use the appropriate citation formats when necessary.
- Graduates will be able to utilize speaking skills effectively when presenting information to others.

Learning Goal #3: Scientific and Quantitative Reasoning - Graduates will be able to understand and apply fundamental scientific and mathematical principles.

- Graduates will be able apply the scientific method to examine behavior, cognition, or social influences.
- Graduates will be able to utilize scientific inquiry in their fields.
- Graduates will be able to calculate and interpret different types of data.
- Graduates will solve problems using appropriate formulas.

Learning Goal #4: Technological Competency and Information Literacy - Graduates will be able to utilize information technologies to gather information.

- Graduates will be able to operate various functions of course-related software.
- Graduates will be able to utilize various electronic sources to enhance knowledge.
- Graduates will be able to demonstrate ethical use of sources.

Learning Goal #5: Equity and Inclusion - Graduates will demonstrate an understanding of inclusion, ethical standards, and the impact of culture on society.

- Graduates will be able to discuss the basic characteristics of the humanities (including literature, art, music, theater, and cinema) in industry.
- Graduates will be able to explain the nature and impact of social inequality, diversity, and inclusion.
- Graduates will be able to examine how biological, cultural, and environmental interactions influence human behavior and cognition.

GENERAL EDUCATION CURRICULUM

Course Descriptions

Course No.	Course Title	Credits
ART 101	Blueprint Reading for Welders	2
	This course provides detailed information to help the students gain the skills that are required to read prints that are most common in the welding industry. Basic lines and view, dimensions, bill of materials and structural shapes are emphasized in this course. Accuracy of measurements and attention to detail will be stressed in the course. (ART)	
ART 103	Introduction to Print Reading and Shop Drawings	1
	This course is designed to introduce the students to the basics of print reading and interpretation. The areas of focus include the lines types, symbols, views, title blocks, that are encountered when dealing with cabinetmaking and industrial prints. Sketching, materials, and finishes are also discussed. The course is intended to give the students an understanding of industrial prints and how their information is conveyed in both diagrammatic and sentential forms. (ART)	
ART 105	Blueprint / Schematic Reading	3
	This course conveys to the students an understanding of the procedures for reading and interpreting industrial prints. The course includes related peripheral information that will enhance the students' understanding of the diversity that is characteristic of industrial prints. Many types of industrial prints and their applications will be covered during this course. (ART)	
ART 110	Contract Drawings	3
	This course will introduce students to reading and understanding Contract Drawings for residential and commercial construction. This course will cover the composition of different industry drawings such as Residential House Plans, Commercial Architectural Plans, Civil Plans, Structural Plans, Plumbing Plans, HVAC Plans and Electrical drawings. Students will be instructed on what type of information these drawings contain and what purpose these drawings serve. (ART)	
ART 115	Web Programming, Client Side Scripting	2
	The focus of this course includes but is not limited to the knowledge and techniques necessary to author industry standard web pages using HTML, XML, CSS, and Java script. Students will discover problems and develop solutions for a typical company web page, as well as the web page's installation, and will learn how to properly support both Windows Internet Information Server and Linux Apache Web Server platforms. Students will also learn about basic principles and methods used to work with databases. (ART, TECH CAR, TC)	

ART 116	Web Programming, Client Side Scripting Lab	1
	The focus of this lab includes but is not limited to the knowledge and techniques necessary to author industry standard web pages using HTML, XML, CSS, and Java script. Students will utilize web-programming languages to design and develop projects that can be debugged/executed in Internet browsers and via private server setups. Students will also utilize debugging tools to solve problems and implement solutions for a typical company web page, as well as the web pages installation and support on both Windows Internet Information Server and Linux Apache Web Server platforms. Students will also utilize basic techniques used to debug database issues. (ART, TECH CAR, TC)	
ART 125	Art in Industry	2
	This course introduces students of various divisions of study to 3D printing in an Art & Design setting. The students will be exposed to how the various industries represented at the college use 3D printing. Lecture topics will include adapting designs for the 3D printing process, creation of an iterative design, designing with texture, modification of primitive polyhedral shapes, and learning rules of 3D design. Students will be exposed to a variety of techniques, processes, materials, and technology commonly used in 3D printing. The students will create and print using a variety of 3D printers and learn post-processing techniques for how to achieve a desired finish on their projects. (ART, TECH CAR, SQR, TC)	
ART 126	Art in Industry Lab	1
	This course is designed to accompany ART 125 Art in Industry. Students will create and print using a variety of 3D printers and learn post-processing techniques for how to achieve a desired finish on their projects. (ART, TECH CAR, SQR, TC)	
ART 127	Computer Aided Design	3
	This course covers various aspects of computer-aided design may include but not limited to: how to read and produce engineer drawings, 2D sketches, extrusion (straight, tapered, revolved, and loft), creating patterns, threads, fillets and chamfers, high-resolution renderings, and simulation studies. (ART, TECH TC)	
ART 129	Introduction to Woodcraft and Design	2
	The course involves the theoretical and practical knowledge in designing and fabrication of wooden products. Topics will include the fundamentals of functional design, basic woodworking skills, and safe use of hand and power tools. This course will explore different wood materials and assembly methods while focusing on conservation of natural resources. (ART VED)	
ART 130	Introduction to Woodcraft and Design Lab	1

This lab course complements the lecture portion of ART 129 Introduction to Woodcraft and Design and will focus on the hands-on practice of design, basic woodworking skills, and safe use of hand and power tools. (ART | VED)

ART 131 Prosthetics Design 3

This course covers the use of digital technology to design and fabricate prosthetics, splints, and supports. Topics of biomimicry, kinematics, computer-aided design, materials, and fabrication will be addressed. Students will design and create functioning prosthetics and splints in the class. (ART, TECH | TC, VED)

AVT 101 Fundamentals of Electricity and Electronics 3

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. The General curriculum subject included in this course and required by FAA-S-ACS-1 is General Subject A. Fundamentals of Electricity and Electronics; Sections AM.I.A.K1 thru AM.I.A.K27. (Co-requisite: AVT 102) (SCI, TECH | CAR, SQR, TC)

AVT 102 Electronics Lab 2

This laboratory course incorporates the skills needed to apply information presented in AVT 101. 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. The General curriculum subject included in this course and required by FAA-S-ACS-1 is General Subject A. Fundamentals of Electricity and Electronics; Sections AM.I.A.R1 thru

AM.I.A.R4 and AM.I.A.S1 thru AM.I.A.S14. (Co-requisite: AVT 102)
(SCI, TECH | CAR, SQR, TC)

- BIO 105** **Physiology and Anatomy** **3**
The structure and functions of the human body as related to biomedical instrumentation are the subject matter covered in this course. Major body systems are discussed, followed by correlations to the physiological variables to be measured and the basic principles of instrumentation that could be used. (SCI | CAR, SQR)
- BIO 107** **Human Anatomy and Physiology I** **3**
This course is the first semester of a medically-oriented study of the structure and function of the human body. It is designed for students specializing in health-related and science programs. Topics include basic biochemistry; basic genetics; cells; tissues; and the integumentary, skeletal, muscular, endocrine and nervous systems. Successful completion of recent high school biology and chemistry courses is highly recommended. (SCI)
- BIO 108** **Human Anatomy & Physiology I Lab** **1**
This lab is designed to enhance and reinforce topics covered in BIO107 lecture. Topics will include body organization, cell anatomy, histology and tissues organization, the integumentary system, the skeletal system, the muscular system, and the nervous system. In addition to the lab manual, this course will utilize McGraw Hill's Anatomy and Physiology Revealed (APR) which is a computerized system that enables students to explore the human anatomy and physiology through the use of a virtual dissection, histological review, and self-paced quizzing. (SCI, TECH | TC)
- BIO 109** **Human Anatomy and Physiology II** **3**
This course is the second semester of a medically-oriented study of the structure and function of the human body. Topics include digestive, cardiovascular, respiratory, lymphatic, immune, urinary, reproductive systems and the inclusion of anatomical topography and transverse anatomy. (*Prerequisite:* BIO 107,108) (SCI)
- BIO 110** **Human Anatomy & Physiology II Lab** **1**
This lab is designed to enhance and reinforce topics covered in BIO109 lecture. Topics will include the blood and circulation, the cardiovascular system, the lymphatic system and immunity, the respiratory system, the urinary system, the reproductive system, the digestive system, and the endocrine system, as well as human development and genetics and metabolic function and nutrition. In addition to the lab manual, this course will utilize McGraw Hill's Anatomy and Physiology Revealed (APR) which is a computerized system that enables students to explore the human anatomy and physiology through the use of a virtual dissection,

histological review, and self-paced quizzing. (*Prerequisite:* BIO 107,108)
(SCI, TECH | TC)

- BUS 101 Introduction to Business 3**
This course includes a survey of current business practices with an examination of the topics of management, ethics, organization, finance, marketing, and human resources function. Particular attention will be paid to examining the current economic environment. Students will also learn about basic personal income, household money management and financial planning skills as well as basic economic decision-making skills. (SOC | IL, VED)
- BUS 105 Electric Commerce (E-commerce) 3**
Provides a history of the Internet and the online technology resources for ecommerce infrastructure, and strategies used by businesses to incorporate Internet marketing and distribute dynamic advertising opportunities in a global electronic market. This course will also cover the legal issues, economical influences, and practices, and define an online society utilizing e-commerce technology for a vast choice of transactions. Students will be required to complete case exercises that present business examples to associate real-world experience and understanding. Requirements to complete this course include students to develop e-commerce strategies, informative tutorials, and create e-commerce technologies for supported materials such as: advertisements, marketing concepts, ecommerce market analyses, and business services on the Internet. (SOC, TECH | IL, TC)
- BUS 110 Business Research & Reporting 3**
This course focuses on the skills and techniques required to research, write and format professional business reports. Topics include locating technical specification, evaluating information, writing specifications, communicating specifications to others, formatting and presenting information. (COM, SOC | COMM, IL, TECH, TL)
- CHM 101 Fundamentals of Chemistry 3**
This course emphasizes the fundamentals of basic chemistry. Students will learn the concept of atoms, molecules and compounds. Students will then apply this knowledge to the concepts including arrangement of the periodic table; chemical equations; stoichiometry; states of matter, concentrations, solutions, and pH (including acids and bases). (SCI | CAR, SQR)
- CHM 102 Fundamentals of Chemistry Lab 1**
This course emphasizes the fundamentals of basic chemistry through the practical experimentation. Students will learn the concept of atoms, molecules and compounds. Students will then apply this knowledge to the concepts including arrangement of the periodic table; chemical equations and reactions; Stoichiometry; the gas laws, concentrations, solutions, and

pH (including acids and bases). (Co-requisite: CHM101) (SCI | CAR, SQR)

- COM 111 Communication Theory 3**
This course addresses specialized communication that helps readers and/or listeners respond to the challenges of corporate culture while being ethically and legally responsible. Class content focuses on acquiring the tools/strategies needed for effective workplace communication and creating effective workplace documents based on the understanding that different customers and audiences affect how information is conveyed. Students cannot take ENG 105 if they complete COM 111. (Prerequisite: ENG 101) (COM, HUM | COMM, VED)
- COM 112 Public Speaking 3**
Stressed in this course is the importance of oral communication for understanding, evaluating, and explaining various occupationally-related conditions. The course content includes theory and practice in the organization, preparation, delivery, and evaluation of extemporaneous discourse. Each student completes a variety of types of speeches. (COM | COMM)
- CPT 101 Microcomputer I 3**
This course is to provide a basic overview of microcomputer fundamentals and applications, including a study of word processing using Microsoft Word, spreadsheet applications using Microsoft Excel, presentations using PowerPoint, email using Outlook, as well as the integration of all the applications. The student is also exposed to basic computer operations, managing files, and a brief introduction to Sway, Edge, Office Mix, and OneNote. (TECH | TC)
- CPT 210 Microcomputer II 3**
This course provides an overview of advanced Microsoft Suite applications, including Microsoft Word, Microsoft Excel, and Microsoft Access. The course will increase business and personal productivity through the use of microcomputer applications. (Prerequisite: CPT 101) (TECH | TC)
- CSM 105 Customer Service and Our World 3**
This course explores the today's business landscape and the forces influencing culture and consumers including media, art, religion, socioeconomics, geopolitics, and literature. It provides a solid foundation for understanding customers and the philosophy of customer service from the perspective of several different industries. Students will utilize and observe service-first verbal and nonverbal communication skills while engaging in role play, case studies, and activities that will stress the importance of customer satisfaction. (COM, HUM, SOC | COMM, VED)

ECO 101	Principles of Economics	3
	This course covers the basic concepts of economics. Topics may include supply and demand, optimizing economic behavior, prices and wages, monetary system, interest rates, banking system, unemployment, inflation, taxes, government spending and international trade. Upon completion, students should be able to explain alternative solutions for economic problems faced by private and government sectors. (SOC CAR, IL)	
EET 161	DC Electricity and Instrumentation	2
	This course introduces the student to the theory and operation of basic DC circuits, circuit construction, operation and troubleshooting. Basic alternative energy technologies are introduced. The student will also receive instruction on soldering, digital multi-meter usage, and Ohm's Law applications for testing and troubleshooting electric circuits. Elements of proper disposal of batteries and other circuit components considered to be hazardous waste are included. (<i>Co-requisite:</i> EET 162) (SCI, TECH CAR, SQR)	
EET 162	DC Electricity and Instrumentation Lab	1
	This course applies the theory taught in EET 161 through hands on building and testing of basic electric circuits. The student will also gain practical experience in soldering, digital multi-meter usage, and Ohm's Law applications for testing and troubleshooting the electric circuits they build. Elements of proper disposal of batteries and other circuit components considered hazardous waste are emphasized throughout this course. (<i>Co-requisite:</i> EET 161) (SCI, TECH CAR, SQR)	
EET 163	Alternating Current and Passive Devices	2
	This course introduces the student to circuitry basic to AC electrical theory. It identifies the fundamental differences between AC and DC energy sources and circuit components. It also introduces oscilloscope usage, AC units, nomenclature and electromagnetism. The course will also cover inductors, transformers, and capacitors and their effects in AC circuits. Work place energy efficiency and conservation habits are included. The concepts of RCL circuits and their use as passive filters will be covered. (<i>Co-requisite:</i> EET 164) (SCI, TECH CAR, SQR)	
EET 164	Alternating Current and Passive Devices Lab	1
	This course applies the theory taught in EET 163 through hands on building and testing of basic AC circuits. The student will use oscilloscopes and digital meters to measure amplitude, frequency and phase of an AC signal. As the student progresses through the course, test equipment will be used to test transformers, inductive circuits, capacitive circuits, and passive filters. The student will also be introduced to troubleshooting techniques and have time to practice those techniques on circuits they build. (<i>Co-requisite:</i> EET 163) (SCI, TECH CAR, SQR)	

ENG 101	English Composition I 3 This course develops writing competency through the students' construction of essays and an academic research paper. Outlining, mechanics, syntax, and format are stressed in all writing assignments. (COM COMM, IL)
ENG 105	Industry Communication 3 This course addresses the written and oral communication required every day in industry and corporate culture regarding customers, peers, supervisors, and employees. Students learn how to express purpose, workplace ethics, and psychological empathy, among other concepts, in workplace communication pieces such as proper email etiquette, memos, and various types of letters. Students cannot take COM 111 if they complete ENG 105. (COM, HUM COMM, VED)
ENT 101	Entrepreneurship I 3 This course acquaints the student with a realistic approach to the problems and concerns of starting a small business. An understanding of the economic and social environment within which the small business functions will be developed. The student will be familiarized with the writing of a business plan. (HUM, SOC CAR, IL, VED)
HMN 101	Introduction to Humanities 3 This course creates an appreciation for cultural values and differences as portrayed in music, painting, architecture, video and literature. When possible, examples that include multiple arts are studied. Diversity is stressed in all examples. (HUM VED)
INT 299	Internship 4 This course is designed to provide students with the opportunity to apply the knowledge and skills learned in previous coursework in an authentic industry setting. Students will further develop and enhance their career-readiness through supervised training in their discipline of interest. (CAR, VED)
MAT 100	Applied Mathematics for Welders 3 This course is an examination of basic arithmetic, (adding, subtracting, multiplying, and dividing whole numbers, decimals and fractions) as well as percentages. This course also covers metric system measurements, computation of geometric measure and shapes, angular development and measurement, and including bends, stretch outs, economical layout and takeoffs. (MAT CAR, SQR)
MAT 101	College Algebra I and Trigonometry 3 This course covers linear equations and inequalities, ratio and proportions, basic operations involving algebraic, polynomial and rational expressions, exponent rules and factoring, an introduction to geometry, including

perimeter, area and volume, right triangle trigonometry and radian measure. (MAT | CAR, SQR)

MAT 103	Technical Math 3 Applied Technical Mathematics is designed to develop a student's math ability, by focusing on math skills that apply in today's work environment. Practical math skills are emphasized, as well as their connection to real world application. (MAT CAR, SQR)
MAT 105	Math for Transportation Division 3 This course provides a review of basic arithmetic concepts (addition, subtraction, multiplication, and division) as well as decimals, fraction, and formulas. Proper measurement and analyzing specifications are also covered. The course then moves into practical application of these math skills to real-world vehicle procedures, data, and specifications. (MAT CAR, SQR)
MAT 110	Trigonometry 3 This course investigates angles triangles, trigonometric functions and equations, radian and degree measurements, circular functions, graphs, identities, vectors, complex numbers, polar coordinates, parametric equations, and applications. (<i>Prerequisite:</i> MAT 101) (MAT CAR, SQR)
MAT 121	Introduction to Statistics 3 This course is intended to introduce students to the basic concepts of data collection, data analysis and statistical inference. Topics include an overview of observational and experimental study designs, graphical and numerical descriptive statistics, probability distributions for simple experiments and random variables, sampling distributions, confidence intervals and hypothesis testing for the mean and proportion in the one sample case. The emphasis is on developing statistical reasoning skills and concepts. (MAT CAR, SQR)
MAT 123	Math for Carpenters 1 This course is an examination of basic arithmetic, (adding, subtracting, multiplying, and dividing whole numbers, decimals and fractions) as well as percent, formulas as it applies to the carpentry courses. This will also include costs, conversion of units, linear, square, cubic, and board measures. (MAT CAR, SQR)
MAT 201	College Algebra II and Trigonometry 3 This course covers systems of equations, solutions to quadratic and higher degree equations, roots and radicals, and oblique triangles. (<i>Prerequisite:</i> MAT 101) (MAT CAR, SQR)
MAT 202	Pre-calculus 3

The course investigates fundamentals of plane analytical geometry, conic sections, complex numbers and polynomial, rational, exponential, logarithmic, and trigonometric functions. (*Prerequisite:* MAT 201) (MAT | CAR, SQR)

- MAT 205 Medicine and Mathematics 2**
The course is designed to help students with an interest in medicine learn how medications dosages are properly determined for a patient. This course can help students interested in medicine or health professions improve the skills needed for their future careers or goals. The course will explore concepts of drug dosing and calculations for the use of fractions, percentages, ratios, proportions and conversions as they relate to the medical world. Units within the apothecary and household systems will also be compared and issues with our interpretation of each system will be discussed. (*Prerequisite:* MAT 101) (MAT | CAR, SQR)
- MTR 100 Medical Terminology 1**
This course is a survey of the terminology used routinely in the medical environment. It will begin with a learning of the common root words used in constructing medical terms and integrate commonly used medical acronyms and abbreviations. The information will be presented according to anatomical systems. The student will be responsible for knowing the written and auditory recognition of the terminology reviewed. (SCI)
- PHY 101 Introductory Physics 3**
This course covers the fundamentals of basic physics. Students will examine the concepts of technical measurement, kinematics (one-dimensional and two-dimensional), force, Newton's Laws of Motion and their applications, work, energy, linear momentum, statics, temperature, heat transfer, thermodynamics, and electromagnetism (including light). Theory and computations will both be emphasized. (*Prerequisite:* MAT 101) (SCI | CAR, SQR)
- PHY 120 Physical Science 3**
This course is a survey course of several of the fundamental scientific principles of chemistry, material science, and physics. The course will integrate atomic structure, chemical reactions, molecular composition and properties of materials (including metals), material strength testing, and application of forces, energy, heat, and gases. Demonstrations and hands-on labs will be used to illustrate concepts related to lecture materials. (*Prerequisite:* MAT 101 or MAT105)(SCI | CAR,SQR)
- PSY 101 General Psychology 3**
This course introduces terms and concepts dealing with basic psychological research methods, human and animal behavior, life-span development, states of consciousness, learning, memory, intelligence, motivation, personality structure, stress and coping, behavior disorders,

social pressures and cultures. Students are encouraged to apply critical thinking strategies through their participation in various discussions of psychological theories and concepts throughout this course. (SOC | CAR, VED)

PSY 105 Industrial and Organizational Psychology 3

This course is designed to introduce students to major areas relevant to the behavior of corporate culture from the time they enter the labor force until retirement. This course focuses both on understanding the psychological bases of work behavior and on the organizational practices used to create a good fit between people's characteristics and work's demands. The goal of this course is to understand how businesses can be designed so that both efficiency and the quality of employee life are improved. Topics will include the history of Industrial and Organizational psychology, job analysis, psychological assessments, personal decisions, training and development, organizational change, teamwork, motivation, job satisfaction, leadership, work-family balance, work stress and health. (HUM, SOC | CAR, VED)

SCI 120 Energy, the Environment, and Everyday Life 3

This course will introduce students to energy and thermodynamics and explore various sources of the energy we consume daily, including fossil fuels, renewable energy, and nuclear energy. Attention will be given to the pros and cons of these different energy types, and consideration of environmental impacts will be made. This course will require students to examine scientific data and think critically about energy use, participate in class discussions, and explore the impacts of energy on the local environment and culture. (HUM, SCI, SOC | CAR, VED)

SCI 150 How It Works 3

This course will familiarize students with some basic principles of physics through their applications to selected everyday phenomena and technology. Students will conduct experiments with everyday objects and toys to illustrate topics. Topics include kinematics (motion), mechanics (forces), thermodynamics (heat), and electromagnetism. In learning the basic physics responsible for ordinary occurrences, students will develop a deeper understanding of how the physical world works and gain a new appreciation of everyday phenomena that are ordinarily taken for granted. This course is designed for non-science students with an interest in the natural world (SCI | CAR, SQR)

SCI 160 Sustainability Design 3

This course will explain what "sustainability" is, the construction materials and methods used in sustainability design, how it relates to building design, and how culture impacts these materials and methods. Students also will examine how energy usage, energy conservation, and

sustainability concepts are applied to practical construction methods and details used in drafting and design. (HUM, SCI | CAR, SQR, VED)

SCI 201	Statics & Strength of Materials	3
	This course is an examination of coplanar force systems, analysis of trusses, axial stress and strain, material properties, centroids, moment of inertia, stresses in beams, beam design, and torsion. (SCI CAR, SQR)	
SOC 101	Introduction to Sociology	3
	Sociology is a way to understand the world. This course is designed to introduce students to the basic principles of sociological inquiry. It includes analysis of social structures and social behavior, including culture and socialization, social institutions, race, class, gender, deviance and social change. Students will be exposed to the basic theoretical and methodological approaches of the discipline. An introduction to sociology will assist students in developing an approach that will allow them to think about and evaluate social situations and issues, thus, acquiring the sociological perspective. (SOC CAR, VED)	
SSS 101	First-Year Experience	1
	This course is designed to help first-year students transition to the college environment, reflect on their personal and academic goals, develop a better understanding of the learning process, and acquire essential skills for success in college and beyond. Topics include campus resources, academic and career planning, time management, personal finances, and current topics in health and wellness. Successful completion of SSS 101 is a graduation requirement for all 1- and 2-year students.	
VMR 151	Introduction to Vehicle Maintenance & Repair Technology	2
	This course covers information on hand tools, machines, and equipment common to the vehicle maintenance field, general service procedures, lubricants, reference manuals, pre-delivery inspection of new and used vehicles and preventive maintenance procedures. This course is designed to prepare students to work properly with all of the for mentioned topics along with building safe and thorough work habits. (TECH IL, TC)	

PROGRAMS OF STUDY

Major Programs

Descriptions of major programs on the following pages include program mission/objective, student learning objectives, a course sequence, and course descriptions. The sequence is designed to satisfy prerequisite requirements, to ensure access to courses that are not available every semester, and to ensure the completion of course requirements. Students are encouraged to adhere to the sequence as much as possible in order to complete the program in the traditional time frame.

The sequence of the programs are designed for students starting the program in the fall semester. Johnson College recognizes that not all students are able to progress through the course sequence as presented. Students admitted into and beginning their coursework at the College in the spring or summer semesters should consult their academic advisor and/or the appropriate program director for further information.

Students who are not able to adhere to the sequence are encouraged to consult with their academic advisor and program director in order to ensure completion of graduation requirements. It is the student's responsibility to follow the curriculum guides as reflected on their advising sheet.

Building Trades and Technology Division – Architectural Drafting & Design Technology (AAS)

Program Objective

The Architectural Drafting & Design Technology program prepares students as entry-level technicians in computer-assisted drafting (CAD) and Building Information Modeling (BIM) for residential and commercial construction. Students will work and learn in all areas of Architectural design and drafting. Instruction and hands-on learning includes all phases of building design drafting, print reading, cost estimating, specifications writing and sustainability concepts.

Career Opportunities

Graduates work as designers, computer drafting technicians, construction estimators, architects' representatives, engineering technicians, facility management technicians and field construction inspectors.

Typical employers in the architectural career field are residential, commercial, and industrial contractors and land developers; architectural design firms, civil design firms, and structural engineering companies; modular and mobile home builders; facilities management companies; real estate developers; and government design agencies.

Program Learning Goals:

Goal 1: Graduates will acquire the skills necessary to obtain an entry-level position in the design field.

Student Learning Outcomes - Students will:

- Accurately draw architectural drawings
- Interpret architectural drawings and sketches
- Coordinate design skills to complete projects

Goal 2: Graduates will demonstrate professional behavior and ethics in order to meet the challenges of work within their field.

Student Learning Outcomes - Students will:

- Work in a team environment
- Be willing to learn new skills

Goal 3: Graduates will acquire critical thinking and decision making skills.

Student Learning Outcomes - Students will:

- Make project decisions based on design skills, codes and ordinances
- Organize and prioritize projects

Architectural Drafting & Design Technology

Major Courses

ADT 151	Introduction to Computer Assisted Drafting (CAD)	2
ADT 152	Introduction to Computer Assisted Drafting (CAD) Lab	2
ADT 153	Residential Planning	2
ADT 154	Residential Planning Lab	2
ADT 155	Residential Cost Estimating	3
ADT 251	Building Information Modeling, Residential	2
ADT 252	Building Information Modeling, Residential Lab	2
ADT 253	Codes and Ordinances	3
ADT 255	Specifications	3
ADT 257	Building Information Modeling, Commercial	2
ADT 258	Building Information Modeling, Commercial Lab	2
ADT 259	Commercial Cost Estimating	3
ADT 263	Architectural History	3
SCI 160	Sustainability Design	3
or INT 299	Internship	4
BTT ##	Building Trades Elective	3
BUS 110	Business Research and Report Writing	3
MAT 110	Trigonometry	3

Core Career Courses

ART 110	Contract Drawings	3
BUS 101	Introduction to Business	3
or CSM 105	Customer Service and Our World	
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
COM 112	Public Speaking	3
MAT 101	College Algebra I and Trigonometry	3
SCI 201	Statics & Strength of Materials	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate	65/66
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Architectural Drafting & Design Technology
Associate in Applied Science (AAS)
Semester Program Outline

Semester 1		Credits
ADT 151	Introduction to Computer Assisted Drafting (CAD)	2
ADT 152	Introduction to Computer Assisted Drafting (CAD) Lab	2
ART 110	Contract Drawings	3
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
SSS 101	First-Year Experience	1
		17
Semester 2		
ADT 153	Residential Planning	2
ADT 154	Residential Planning Lab	2
ADT 155	Residential Cost Estimating	3
BUS 101	Introduction to Business	3
or CSM 105	Customer Service and Our World	
COM 112	Public Speaking	3
MAT 110	Trigonometry	3
		16
Semester 3		
ADT 251	Building Information Modeling, Residential	2
ADT 252	Building Information Modeling, Residential Lab	2
ADT 253	Codes and Ordinances	3
ADT 255	Specifications	3
BTT ##	Building Trades Elective	3
SCI 201	Statics & Strength of Materials	3
		16
Semester 4		
ADT 257	Building Information Modeling, Commercial	2
ADT 258	Building Information Modeling, Commercial Lab	2
ADT 259	Commercial Cost Estimating	3
ADT 263	Architectural History	3
SCI 160	Sustainability Design	3
or INT 299	Internship	4
BUS 110	Business Research and Report Writing	3
		16/17
Minimum Credits to Graduate		65/66

Architectural Drafting & Design Technology

Course Descriptions

Course No.	Course Title	Credits
ADT 151	Introduction to Computer-Assisted Drafting (CAD) This course is an introductory course into Computer-Assisted Drafting. It explains basic CAD commands required to produce working drawings. Students will work with basic lines and editing commands to more complicated concepts in computer drafting. They will produce basic Floor Plans, Elevations, Sections and Details required in the residential drafting field.	2
ADT 152	Introduction to Computer-Assisted Drafting Lab This lab session aligns with ADT151 and enhances the lecture session with practical Computer-Assisted drafting experiences. Students will practice their skills and techniques with the AutoCad Program creating contract drawings to industry standards. (<i>Co-requisite:</i> ADT 151)	2
ADT 153	Residential Planning This course will provide hands on Computer-Assisted Drafting (CAD) to create Residential Floor Plans, Residential Elevations, Site Layouts, Structural Framing Plans, Plumbing Plans and Electrical drawings. It will explain in detail what is required on a Residential Set of drawings for permitting purposes and will introduce students to basic Sustainability concepts and procedures. (<i>Prerequisite:</i> ADT 151, ADT 152)	2
ADT 154	Residential Planning Lab This lab session aligns with ADT153 and enhances the lecture session with practical Computer-Assisted drafting experiences. Students will practice their skills and techniques with the AutoCAD Program creating contract drawings to industry standards. (<i>Prerequisite:</i> ADT 151, ADT 152; <i>Co-requisite:</i> ADT 153)	2
ADT 155	Residential Cost Estimating This course will train students to use Residential Drawings to calculate areas, volumes and other material quantities in order to estimate material costs. It will introduce students to gathering information from various types of drawings such as Site Plans, Floor Plans, Structural Plans, building systems plans and use that information to estimate construction costs for the projects. (<i>Prerequisite:</i> ART 110)	3
ADT 251	Building Information Modeling, Residential This course expands computer skills to include Building Information Modeling (BIM) for residential construction. This course includes basic Residential building modeling and presentation of the projects in multi-views. It contains sustainability concepts such as site orientation studies for sustainability design.	2
ADT 252	Building Information Modeling, Residential Lab This lab session aligns with ADT251 and enhances the lecture session with practical Building Information Modeling (BIM) drafting experiences. Students will practice their skills and techniques with the Autodesk Revit Program creating contract drawings to industry standards. (<i>Co-requisite:</i> ADT 251)	2

ADT 253	Codes and Ordinances This course introduces students to the many regulatory agencies that govern over the drafting and design field. It emphasizes the preparation of permit information for residential projects along with commercial building regulations for the protection of public health, safety and welfare. This course explains in further detail what it means to be sustainable and what practices can be used in “Green Building” Technology.	3
ADT 255	Specifications This course explores building project materials and product specifications from the CSI format and how these materials and products relate to the drafting and design process. Students will research and write basic building material specifications and sketching necessary to define the scope of work, construction materials, methods and quality control.	3
ADT 257	Building Information Modeling, Commercial This course expands BIM skills to include Commercial Building Projects and the use of features such as structural steel, multi-levels, curtain walls and store fronts. Students will expand the use of Building Information Modeling by using more advanced program features to implement commercial design into the projects.	2
ADT 258	Building Information Modeling, Commercial Lab This lab session aligns with ADT 257 and enhances the lecture session with practical Building Information Modeling (BIM) drafting experiences. Students will practice their skills and techniques with the Autodesk Revit Program creating contract drawings to industry standards. (<i>Co-requisite: ADT 257</i>)	2
ADT 259	Commercial Cost Estimating This course will teach basic estimating calculations and train students to use Commercial Building Plans to calculate materials and bring a new dimension to estimating. It will include estimates on commercial building methods such as site work, architectural work, structural steel systems and commercial building products. (<i>Prerequisite: ART 110</i>)	3
ADT 263	Architectural History	3

Building Trades and Technology- Civil Design Technology (AAS)

Program Objective

The Civil Design Technology program prepares students as entry-level technicians in the field of civil engineering. This program provides the foundation for applying basic engineering principles and technical skills in support of civil engineers engaged in designing and executing public works projects such as highways, dams, bridges, tunnels and other facilities. The program also emphasizes professional interpersonal skills.

Career Opportunities

Graduates work as civil designers, CAD technicians, survey technicians, design engineering technicians, or similar roles in the civil engineering industry. Typical employers in the civil design career field are civil design and engineering firms, structural engineering companies, environmental engineering firms, surveyors, consulting firms, construction companies, and government design agencies.

Program Learning Goals:

Goal 1: Graduates will acquire the skills necessary to obtain an entry-level position in the civil design field.

Student Learning Outcomes - Students will:

- Demonstrate proficiency with design software such as AutoCAD, Advance Steel, GIS, and Civil 3D
- Interpret maps and surveys
- Calculate storm water hydrology and structural analysis/design
- Create civil engineering plans and details
- Have skills needed to be engaged with industries or government agencies that design, construct, and maintain civil engineering structures.

Goal 2: Graduates will demonstrate professional behavior and ethics in order to meet the challenges of work within their field.

Student Learning Outcomes - Students will:

- Work in a team environment
- Acknowledge diversity as a benefit to all organizations
- Practice professionalism through consideration and respect for others

Goal 3: Graduates will acquire critical thinking and decision-making skills.

Student Learning Outcomes - Students will:

- Analyze various components of project requirements to develop design solutions
- Make project decisions based on design skills and knowledge of environmental inputs
- Effectively use software to help solve industry challenges

Civil Design Technology Major Courses

BTT/ CDT	Elective	3
ADT 151	Introduction to Computer Assisted Drafting (CAD)	2
ADT 152	Introduction to Computer Assisted Drafting (CAD) Lab	2
CDT 101	Introduction to Civil Design	3
CDT 121	Civil 3D I	2
CDT 122	Civil 3D I Lab	2
CDT 123	Surveying and Mapping	3
CDT 124	Construction Materials and Management	3
CDT 201	Advanced Steel I	2
CDT 202	Advanced Steel I Lab	2
CDT 203	Introduction to Structural Analysis	3
CDT 205	Hydraulics and Hydrology	2
CDT 206	Hydraulics and Hydrology Lab	1
CDT 207	Erosion and Sediment Control	3
CDT 221	Civil 3D II	2
CDT 222	Civil 3D II Lab	2
or CDT 223	Introduction to Geographic Information Systems (GIS)	
CDT 224	Introduction to Geographic Information Systems (GIS) Lab	
INT 299	Internship	4
MAT 110	Trigonometry	3
SCI 201	Statics & Strength of Materials	3
Core Career Courses		
ART 110	Contract Drawings	3
SS Elec.	Social Science Elective	3
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industrial Communication	
COM 112	Public Speaking	3
MAT 101	College Algebra I and Trigonometry	3
PHY 101	Introductory Physics	3
SSS 101	First-Year Experience	1
Minimum Credits to Graduate		69

Civil Design Technology
Associate in Applied Science (AAS)
Semester Program Outline

Semester 1		Credits
BTT/ CDT	Elective	3
ADT 151	Introduction to Computer Assisted Drafting (CAD)	2
ADT 152	Introduction to Computer Assisted Drafting (CAD) Lab	2
ART 110	Contract Drawings	3
CDT 101	Introduction to Civil Design	3
CPT 101	Microcomputer I	3
MAT 101	College Algebra I and Trigonometry	3
SSS 101	First-Year Experience	1
		20
Semester 2		
ENG 101	English Composition I	3
or ENG 105	Industrial Communication	
MAT 110	Trigonometry	3
CDT 123	Surveying and Mapping	3
CDT 207	Erosion and Sediment Control	3
CDT 121	Civil 3D	2
CDT 122	Civil 3D Lab	2
		16
Semester 3		
CDT 201	Advanced Steel I	2
CDT 202	Advanced Steel I Lab	2
CDT 203	Introduction to Structural Analysis	3
CDT 205	Hydraulics and Hydrology	2
CDT 206	Hydraulics and Hydrology Lab	1
SOC ###	Social Science Elective	3
CDT 124	Construction Materials and Mangement	3
PHY101	Introductory Physics	3
		19
Semester 4		
CDT 221	Civil 3D II	2
CDT 222	Civil 3D II Lab	2
or		
CDT 223	Introduction to Geographic Information Systems (GIS)	2
CDT 224	Introduction to Geographic Information Systems (GIS) Lab	2
SCI 201	Statics & Strength of Materials	3
COM 112	Public Speaking	3
INT 299	Internship	4
		14
Minimum Credits to Graduate		69

Civil Design Technology Course Descriptions

Course No.	Course Title	Credits
ADT 151	Introduction to Computer-Assisted Drafting (CAD) This course is an introductory course into Computer-Assisted Drafting. It explains basic CAD commands required to produce working drawings. Students will work with basic lines and editing commands to more complicated concepts in computer drafting. They will produce basic Floor Plans, Elevations, Sections and Details required in the residential drafting field.	2
ADT 152	Introduction to Computer-Assisted Drafting Lab This lab session aligns with ADT151 and enhances the lecture session with practical Computer-Assisted drafting experiences. Students will practice their skills and techniques with the AutoCad Program creating contract drawings to industry standards. (<i>Co-requisite:</i> ADT 151)	2
CDT 101	Introduction to Civil Design This course introduces students to the theory, tools, and techniques of engineering design and creative problem-solving, as well as design issues and practices in civil engineering. The course also exposes the students to issues related to engineering practice such as working in teams, scheduling, evaluating risk and making ethical decisions.	3
CDT 105	Drones for Industry Prepare for an exciting career as a Drone Pilot. This course prepares you to learn about FAA regulations around drone technology. Gain hands-on experience flying a variety of drones, including the DJI Inspire, in real world scenarios. Students will also train on software and applications to manipulate photos, video and data captured by the drones.	3
CDT 121	Civil 3D I In this course, students will learn to design civil infrastructure using AutoCAD Civil 3D. Students will create topographic surveys by importing field-generated data, develop site parcels using survey data, create site profiles and also learn to use surface and point manipulation tools to reflect existing and future site conditions. Students will also design and create corridors, intersections, and a pressure network and construct underground utilities.	2
CDT 122	Civil 3D I Lab This lab session aligns with CDT 121 and enhances the lecture session with practical Computer-Assisted drafting experiences. Students will practice their skills and techniques with the AutoCAD Civil 3D Program creating drawings to industry standards.	2
CDT 123	Surveying and Mapping This course provides an introduction to theory and practice of geomatics including measurement and computations of distances, angles, and directions. Students will also	3

learn traverse procedures, electronic data collection, calculations, and accuracy standards.

CDT 124	Construction Materials and Management This course provides an introduction to prepares students for a challenging and rewarding career in management within the construction industry. This option provides students with additional knowledge to organize and manage people, materials, and processes of construction, utilizing the latest technologies within the industry.	3
CDT 201	Advanced Steel I This course will introduce students to Autodesk's Advanced Steel software and its use in modeling for steel detailing and fabrication. Students will learn modeling and detailing in the following areas: connectors, special parts, stairs and railings, project management, multi-user, management tools, plateworks, and customer connections.	2
CDT 202	Advanced Steel I Lab This lab session aligns with CDT 201 and enhances lecture sessions with practical application of the Advanced Steel software. Students will practice their skills through project-driven application as commonly found in industry.	2
CDT 203	Introduction to Structural Analysis This course provides an introduction to structural analysis, and focuses on the classification of structural elements; analysis of statically determinate trusses, beams, and frames; deflections in elementary structures; and load calculations.	3
CDT 205	Hydraulics and Hydrology Principles of hydraulics and hydrology applicable to civil engineering. Topics include hydrologic cycle; measurement and estimation of precipitation; storm water runoff calculations; stream flow measurement; erosion and sedimentation control measures; hydraulic structure design, including channels, culverts, pipes, inlets, and detention basins; design of sedimentation control devices; current environmental regulations and permits; and computer applications.	2
CDT 206	Hydraulics and Hydrology Lab This lab aligns with CDT 205. Students will apply to apply the principles of hydraulics and hydrology, practicing the concepts in a lab environment.	1
CDT 207	Erosion and Sediment Control This course introduces students to the fundamentals of soil erosion and sediment control. Students will also learn planning and design processes, maintenance requirements, and compliance with local, state, and federal regulations.	3
CDT 221	Civil 3D II In this course, students will learn advanced techniques in the AutoCAD Civil 3D modeling software. Students learn advanced roadway modeling, advanced grading, and customization features. Students will become proficient in interchange design, storm water and sewer design, and platform grading and pond design.	2

CDT 222	Civil 3D II Lab	2
	This lab session aligns with CDT 221 and enhances the lecture session with practical Computer-Assisted drafting experiences. Students will practice their skills and techniques with the AutoCAD Civil 3D Program creating drawings to industry standards.	
CDT 223	Introduction to Geographic Information Systems	2
	This course introduces the principles of the structure and function of Geographic Information Systems. This includes raster and vector data structures, coordinate systems, and projections and geo-referencing, data capture and editing, creation and management of attribute data, basic and advanced spatial analysis, accuracy and availability of geospatial data, dissemination of output as maps, reports and over the Internet and hardware, software and technology integration issues.	
CDT 224	Introduction to Geographic Information Systems Lab	2
	This lab session aligns with CDT 223 and enhances lecture sessions with practical application of the GIS software. GIS application lab covers a wide variety of areas such as local governments, urban infrastructure management, natural resource management, geologic analysis, marketing will be explored	

Building Trades and Technology -

Carpentry & Cabinetmaking Technology (AAS)

Program Objective

The Carpentry & Cabinetmaking Technology program prepares students as entry-level trades people in the layout, estimation, and construction of residential construction including the installation of trim, furniture, stairs and cabinets. The skill set would also include weatherization installers and technicians and conservation retrofitters. Leadership and management skills are stressed. Students work with industry standard tools and equipment such as table saws, jointers, power tools, hand tools, pneumatic nailers, and laser levels.

Career Opportunities

Graduates work as rough and finish carpenters, cabinetmakers, mill workers, building product representatives, and custom woodworkers. Typical employers in the carpentry and cabinetmaking career field are residential, commercial, and industrial construction companies; remodeling contractors; cabinet and showcase manufacturers; mill-work companies and lumber yards; wholesale and retail building product suppliers; modular home manufacturers; large institutional, business, and industrial complexes; and architectural engineering firms.

Program Learning Goals:

Goal 1: The carpentry and cabinet making program will prepare the student for entry level employment in a variety of fields of construction.

Student Learning Outcomes – Students will:

- Identify different construction materials
- Select and use appropriate power tools for specific project
- Produce and interpret cabinet shop drawings
- Become familiar with reading a tape measure.
- Learn the importance of being on time and ready to work.
- Have the opportunity to participate in an internship to gain real-world experience.

Goal 2: The program will cover residential construction from the “ground to the clouds” and does so with an emphasis on safety first.

Student Learning Outcomes – Students will:

- Observe job site, shop safety and tool safety practices.
- Safely work with scaffolding and ladders.
- Repair tools and power cords to keep the jobsite safe.
- Demonstrate the ability to frame walls, floors and roofs.

Goal 3: The graduate can examine the pre-planning phases of construction through project completion and apply sound customer relation practices.

Student Learning Outcomes – Students will:

- Accurately provide residential estimates
- Propose and interpret appropriate plans based on building site layouts
- Learn basic communication skills to help with customer relations.

Goal 4: The program will teach students the proper construction of kitchen cabinets.

Student Learning Outcomes – Students will:

- Students will learn how to construct cabinet doors.
- Students will layout and cut material for faceframes.
- Students will construct cabinet carcasses and attach faceframes.

Carpentry and Cabinetmaking Technology

Major Courses

ADT 155	Residential Cost Estimating	3
ART 103	Introduction to Print Reading and Shop Drawings	1
CCM 153	Woodworking Hand and Power Tools	2
CCM 154	Woodworking Hand and Powertools Lab	4
CCM 169	Cabinet and Component Construction	2
CCM 170	Cabinet and Component Construction Lab	4
CCM 231	Site Layout, Foundations and Framing Principles	2
CCM 232	Site Layout, Foundations and Framing Principles Lab	4
CCM 233	Interior/Exterior Finishes	2
CCM 234	Interior/Exterior Finishes Lab	4
CCM 235	Roof Framing and Stair Building	2
CCM 236	Roof Framing and Stair Building Lab	4
MAT 110	Trigonometry	3
MAT 123	Math for Carpenters	1
BTT ###	Construction Elective	3
or		
INT299	Internship	4

Core Career Courses

ART 110	Contract Drawings	3
BUS 101	Introduction to Business	3
or CSM 105	Customer Service and Our World	
COM ###	Communication Elective	3
CPT 101	Microcomputers I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
SCI ###	Science Elective	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate	63/64
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Carpentry & Cabinetmaking Technology

Associate in Applied Science (AAS)

Semester Program Outline

Semester 1		Credits
CCM 153	Woodworking Hand and power tools	2
CCM 154	Woodworking Hand and power tools Lab	4
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 123	Math for Carpenters	1
SSS 101	First-Year Experience	1
		14
Semester 2		
ART 103	Introduction to Print Reading and Shop Drawings	1
CCM 169	Cabinet and Component Construction	2
CCM 170	Cabinet and Component Construction Lab	4
BUS 101	Introduction to Business	3
or CSM 105	Customer Service and Our World	
MAT 101	College Algebra I and Trigonometry	3
SCI ###	Science Elective	3
		16
Semester 3		
ART 110	Contract Drawings	3
CCM 231	Site Layout, Foundations, and Framing Principles	2
CCM 232	Site Layout, Foundations, and Framing Principles Lab	4
CCM 233	Interior/Exterior Finishes	2
CCM 234	Interior/Exterior Finishes Lab	4
MAT 110	Trigonometry	3
		18
Semester 4		
ADT 155	Residential Cost Estimating	3
BTT ###	Construction Elective	3
or		
INT 299	Internship	4
CCM 235	Roof Framing and Stair Building	2
CCM 236	Roof Framing and Stair Building Lab	4
COM ###	Communication Elective	3
		15/16
Minimum Credits to Graduate		63/64

Carpentry & Cabinetmaking Technology Course Descriptions

Course No.	Course Title	Credits
ADT 155	Residential Cost Estimating This course will train students to use Residential Drawings to calculate areas, volumes and other material quantities in order to estimate material costs. It will introduce students to gathering information from various types of drawings such as Site Plans, Floor Plans, Structural Plans, building systems plans and use that information to estimate construction costs for the projects. (<i>Prerequisite:</i> ART 110)	3
CCM 133	Fundamentals of Carpentry This course is the study and practice of the common materials and procedures used in residential construction and remodeling. The course provides practical lessons in basic wall framing, drywall application and finish. Students will be exposed to the safe use of equipment and materials common to the construction industry. Students will be required to demonstrate knowledge of different materials, tools and applications in the construction industry.	1
CCM 134	Fundamentals of Carpentry Lab Fundamentals of Carpentry Lab provides students the opportunity to apply theory to practice in a lab or live-lab environment. Students will select common materials and use building procedures appropriate for residential construction. Students will practice the safe use and maintenance of construction tools and equipment. (<i>Co-requisite:</i> CCM 133)	2
CCM 153	Woodworking Hand and Power Tools Identifying safe operations of stationary woodworking equipment are the core elements of this course. Through demonstration, the student will be introduced to the safe use of the table saw, the radial arm saw, the band saw, the planer, the jointer, the overhead router, the drill press, the shaper, and the tenoner.	2
CCM 154	Woodworking Hand and Power Tools Lab The safe operations of stationary woodworking equipment are the core elements of this course. Through demonstration and guided application the student will be introduced to the safe use of sanding machines, the table saw, the radial arm saw, the band saw, the planer, the jointer, the overarm router, the drill press, the shaper, and the mortiser. (<i>Co-requisite:</i> CCM 153)	4
CCM 169	Cabinet and Component Construction The focus of this course is the components and construction of cabinets, face frames, doors and drawers common to the cabinetmaking industry. The special operations required on specific wood working machinery and the assembly of these cabinets' components is practiced in this course. Hinges, pulls, slides and similar door and drawer hardware are also studied as are the properties of wood and the fasteners used in the carpentry/cabinetmaking field. The student will continue to learn the safe use of sanding machines, table saw, radial arm saw, band saw, planer, jointer, overarm router, drill press, shaper, and the tenoner. (<i>Co-requisite:</i> CCM 170)	2

CCM 170	Cabinet and Component Construction Lab	4
	This course provides the opportunity for students to apply the theory and concepts of CCM 169 Cabinet and Component Construction. Students will practice cutting components and construction of cabinets, face frames, doors and drawers common to the cabinetmaking industry. Students will design, cut, assemble, and finish cabinets and various other woodworking projects. (<i>Co-requisite</i> : CCM 169)	
CCM 231	Site Layout, Foundations and Framing Principles	2
	This course covers footing and foundation, the use of the structure, soil and climate conditions, methods of construction, and placement of the structure on the lot. Site layout procedures and the use of common leveling instruments are studied. Elements of the building codes and zoning laws that apply to site layout procedures are also examined in this course. This course also covers the construction terminology, materials, methods and practical lessons in the various types of floor and wall framing principles found in the construction industry today. Construction terminology, materials estimating, and proper construction techniques give the student a broad knowledge of modern construction practices. (<i>Prerequisite</i> : CCM 169, CCM 170)	
CCM 232	Site Layout, Foundations and Framing Principles Lab	4
	This course provides the opportunity for students to apply the theory and concepts of CCM 231 Site Layout, Foundations, and Framing Principles. Students will practice site layout procedures and use common leveling instruments. Students will also practice floor and wall framing. (<i>Prerequisite</i> : CCM 169, CCM 170; <i>Co-requisite</i> : CCM 232)	
CCM 233	Interior/Exterior Finishes	2
	Interior and Exterior Finishes is the study of common materials and procedures used for finishing the interior and exterior of a building. Students will be exposed to skills in the safe use of equipment and materials common to the construction industry.	
CCM 234	Interior/Exterior Finishes Lab	4
	This course provides the opportunity for students to apply the theory and concepts of CCM 233 Interior and Exterior Finishes. Students will practice skills in the safe use of equipment and materials common to the construction industry. (<i>Co-requisite</i> : CCM 233)	
CCM 235	Roof Framing and Stair Building	2
	This course includes the study of gable roofs, hip roofs, intersecting roofs, and special roof systems. Students will study the applicable building codes, solve for rafter lengths, estimate materials, and other operations required for roof framing. Students will also learn the basics of stair construction including design and configuration of stairs and methods of layout and construction.	
CCM 236	Roof Framing and Stair Building Lab	4
	This course provides the opportunity for students to apply the theory and concepts of CCM 235 Roof Framing and Stair Building. Students will practice design, layout, and construction of roofing systems and stairs. (<i>Co-requisite</i> : CCM 235)	

Building Trades and Technology – Electrical Construction Technology (AAS)

Program Objective:

The Electrical Construction Technology program prepares students as entry-level technicians for the operation, inspection, installation, calibration, repair, maintenance and safety of residential and commercial electrical equipment.

Career Opportunities:

Graduates work as residential and commercial electricians, industrial engineering technicians in production environments. Graduates will also be prepared as quality assurance technicians, linemen or technicians for the power industry. Typical employers in the electrical field are telecommunications companies, utilities, Union and Non-union electrical companies and manufacturing companies.

Program Learning Goals:

Goal 1: The graduate will be prepared as an entry-level technician in the electrical construction and maintenance industry

Student Learning Outcomes - Students will:

- Install cables and raceways
- Read and understand electrical prints
- Be proficient in meter usage

Goal 2: Graduates will demonstrate safe electrical practices and understand how important they are in the electrical environment.

Student Learning Outcomes - Students will:

- Properly demonstrate lock out / tag out practices
- Perform tasks in accordance with OSHA guidelines
- Demonstrate proper usage of personal protective equipment (PPE)

Goal 3: Graduates will acquire a foundation of education and skills for career advancement and lifelong learning.

Student Learning Outcomes - Students will:

- Perform in a professional manner
- Understand the National Electrical Code (NEC)
- Demonstrate proper installation and worksite housekeeping

Electrical Construction Technology Major Courses

BTT ###	Construction Elective	3
BTT 103	Introduction to Pipefitting	2
BTT 105	Introduction to Electricity for the Trades	1
BTT 106	Introduction to Electricity for the Trades Lab	2
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
BTT 251	Motors and Controls	2
BTT 252	Motors and Controls Lab	4
ECM 161	Residential Wiring	2
ECM 162	Residential Wiring Lab	4
MEC 245	Programmable Logic Controllers I	2
MEC 246	Programmable Logic Controllers I Lab	2
ECM 271	Electrical Grounding, Bonding, & Service Installation	1
ECM 272	Electrical Grounding, Bonding, & Service Installation Lab	2
ECM 273	National Electric Code Interpretation	1
ECM 275	Commercial Wiring	1
ECM 276	Commercial Wiring Lab	2
ECM 277	Industrial Maintenance and Mechanics	1
ECM 278	Industrial Maintenance and Mechanics Lab	2
ECM 260	Applied Practice and Special Topics Lab	4
or INT 299	Internship	
Core Career Courses		
ART 110	Contract Drawings	3
BUS 101	Introduction to Business	3
or CSM 105	Customer Service and Our World	
COM ###	Communication Elective	3
CPT 101	Microcomputers I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
SCI ###	Science Elective	3
SSS 101	First-Year Experience	1
Minimum Credits to Graduate		63

Electrical Construction Technology

Associate in Applied Science (AAS)

Semester Program Outline

Semester 1		Credits
BTT 103	Introduction to Pipefitting	2
BTT 105	Introduction to Electricity for the Trades	1
BTT 106	Introduction to Electricity for the Trades Lab 2	
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
SSS 101	First-Year Experience	1
		15
Semester 2		
BTT ###	Construction Elective	3
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
ECM 161	Residential Wiring	2
ECM 162	Residential Wiring Lab	4
BUS 101	Introduction to Business	3
or CSM 105	Customer Service and Our World	
SCI ###	Science Elective	3
		18
Semester 3		
MEC 245	Programmable Logic Controllers I	2
MEC 246	Programmable Logic Controllers I Lab	2
ART 110	Contract Drawings	3
COM ###	Communication Elective	3
ECM 271	Electrical Grounding, Bonding, & Service Installation	1
ECM 272	Electrical Grounding, Bonding, & Service Installation Lab	2
ECM 273	National Electric Code Interpretation	1
ECM 275	Commercial Wiring	1
ECM 276	Commercial Wiring Lab	2
		17
Semester 4		
BTT 251	Motors and Controls	2
BTT 252	Motors and Controls Lab	4
ECM 277	Industrial Maintenance and Mechanics	1
ECM 278	Industrial Maintenance and Mechanics Lab	2
ECM 260	Applied Practice and Special Topics Lab	4
or INT 299	Internship	
		13
Minimum Credits to Graduate		63

Electrical Construction Technology Course Descriptions

Course No.	Course Title	Credits
BTT 103	Introduction to Pipefitting This introductory pipefitting course provides students with a basic understanding of the materials, processes and tools used in residential and light commercial applications. Students will learn safe-work practices, as well as common components and fixtures that are installed in various settings.	2
BTT 105	Introduction to Electricity for the Trades This course provides introductory information and practical experience in installation of basic electrical systems in residential and commercial applications. This course will demonstrate proper usage of both electrical hand tool and power tools. This course will discuss basic electrical theories and codes.	1
BTT 106	Introduction to Electricity for the Trades Lab This course provides introductory information and practical experience in installation of basic electrical systems in residential and commercial applications. This course will demonstrate proper usage of both electrical hand tool and power tools. This course will discuss basic electrical theories and codes. Lab times for this course will be scheduled both on and off campus. (Co-requisite: BTT 105)	2
BTT 151	Fundamentals of Electricity This course covers general safety principles, basic construction guidelines, and laws governing electricity emphasizing theoretical concepts. Fundamentals such as Ohm's Law as it relates to DC and AC circuits will be covered in depth. Electrical components such as resistors, capacitors, and inductors will be examined.	2
BTT 152	Fundamentals of Electricity Lab This course covers general safety principles, basic construction guidelines and laws governing electricity, basic hand tool usage, print reading, electrical safety, circuit construction and operation. This course will also begin to outline use and interpretation of the National Electrical Code (NEC). (Co-requisite: BTT 151)	1
BTT 251	Motor and Controls This course covers the fundamental concepts of motors and motor controls. Topics include ladder diagrams, pilot devices, contactors, motor starters, motors, and other control devices. This course also covers service and repair principles and practices for industrial electrical systems, industrial electronic devices, programmable controllers, welding, boilers, HVAC, mechanical and pneumatic and fluid power systems. Upon completion, students will be able to properly select, connect, and troubleshoot motors and control circuits. (<i>Prerequisite:</i> BTT 151, BTT 152)	2
BTT 252	Motor and Controls Lab This course provides students with the opportunity to apply the theory and concepts covered in BTT 251. Students will practice working with ladder diagrams, pilot devices, contactors, motor starters, motors, and other control devices. They will also work with industrial electrical systems, industrial electronic devices, programmable	4

controllers, welding, boilers, HVAC, mechanical and pneumatic and fluid power systems. Upon completion, students will be able to properly select, connect, and troubleshoot motors and control circuits. (*Prerequisite:* BTT 151, BTT 152; *Co-requisite:* BTT 251)

- | | | |
|----------------|---|----------|
| ECM 161 | Residential Wiring | 2 |
| | This course covers general safety principles, basic construction guidelines and laws governing electricity, basic hand tool usage, print reading, electrical safety, circuit construction and operation. (<i>Prerequisite:</i> BTT 105, BTT 106) | |
| ECM 162 | Residential Wiring Lab | 4 |
| | This provides the opportunity to practice the concepts of Residential Wiring. Students will apply general safety principles, basic construction guidelines and laws governing electricity, basic hand tool usage, print reading, electrical safety, circuit construction and operation. Lab times for this course will be scheduled both on and off campus. (<i>Prerequisite:</i> BTT 105, BTT 106; <i>Co-requisite:</i> ECM 161) | |
| ECM 260 | Applied Practice and Special Topics Lab | 4 |
| | This comprehensive course allows the student to apply the concepts covered in ECM 259. It is intended to be student project based which will prepare students for an entry-level position.
(<i>Prerequisite:</i> AMT 253, AMT 254, BTT 151, BTT152, ECM 151, ECM152, BTT 251, BTT 252, ECM 161, ECM 162, ECM 271, ECM 272, ECM 273, ECM 276, ECM 277, ECM 278) | |
| ECM 271 | Electrical Grounding, Bonding, & Service Installation | 1 |
| | This course is a continuation of electrical residential wiring. The focus of this course is problem-solving skills in panel board selection, electric service, and overcurrent protection such as fuses and circuit breakers, as well as low voltage lighting and cooling systems. AC circuit theory will continued to be discussed in this course. | |
| ECM 272 | Electrical Grounding, Bonding, & Service Installation Lab | 2 |
| | This provides the opportunity for students to apply the concepts and theories discussed in ECM 271. The focus of this course is problem-solving skills in panel board selection, electric service, and overcurrent protection such as fuses and circuit breakers, as well as low voltage lighting and cooling systems. AC circuit theory will continued to be discussed in this course. (<i>Co-requisite:</i> ECM 171) | |
| ECM 273 | National Electric Code Interpretation | 1 |
| | The purpose of this course is to locate and interpret the sections in the NEC pertaining to electrical installations; calculate the size of conductors, boxes, raceways, and overcurrent protective devices for branch circuits supplying electrical equipment, calculate conductor size, overcurrent protection for service equipment as applied to building services and compute the size of branch circuits, feeders and equipment for motors. | |
| ECM 275 | Commercial Wiring | 1 |
| | This course provides information about the installation of electrical systems for commercial buildings, reading architectural drawings, and branch circuit feeders and installation, as well as appliance and special systems found in commercial buildings. Three phase circuits and inductive loads will be covered in this course. | |

ECM 276	Commercial Wiring Lab	2
	This course provides practical experience in installation of electrical systems for commercial buildings, reading architectural drawings, and branch circuit feeders and installation, as well as appliance and special systems found in commercial buildings. Students receive practical experience in conduit bending. Three phase circuits and inductive loads will be covered in this course. Lab times for this course will be scheduled both on and off campus. (<i>Co-requisite</i> : ECM 275)	
ECM 277	Industrial Maintenance and Mechanics	1
	This course covers the theory and practice of industrial mechanics including calculations, rigging, lifting, ladders, hydraulics, lubrication, flexible belt drive systems, vibration and alignment. This course also covers service and repair principles and practices for industrial electrical systems, industrial electronic devices, programmable controllers, boilers, HVAC, mechanical, pneumatic and fluid power system.	
ECM 278	Industrial Maintenance and Mechanics Lab	2
	This course provides students with the opportunity to apply the knowledge learned in ECM 277. Students will practice of industrial mechanics including calculations, rigging, lifting, ladders, hydraulics, lubrication, flexible belt drive systems, vibration and alignment. Students will also covers service and repair principles and practices for industrial electrical systems, industrial electronic devices, programmable controllers, boilers, HVAC, mechanical, pneumatic and fluid power systems. (<i>Co-requisite</i> : ECM 277)	
MEC 245	Programmable Logic Controllers I	2
	This course is designed to introduce the student to modern programmable logic controllers base on Control Logix and Compact Logix Programmable Automation Controllers (PAC's). The student will investigate the specification, setup, configuration, programming, and implementation of the controller. The course then continues with an examination of the different types of hardware devices that are used in conjunction with PAC's. An emphasis is placed on programming projects throughout the course. (<i>Co-requisite</i> : MEC 246, MEC 243, MEC 244)	
MEC 246	Programmable Logic Controllers I Lab	2
	The student will investigate the setup, configuration, programming, and implementation of the controllers through lab exercises designed to have the student build a system from beginning to end. As the student progresses through this course the experiments will progressively build toward real world applications. (<i>Co-requisite</i> : MEC 245, MEC 243, MEC 244)	

Building Trades and Technology –

Heating, Ventilation, & Air Conditioning Technology (AAS)

Program Objective

The Heating, Ventilation, and Air Conditioning (HVAC) program provides students with the skills needed for entry-level positions in the installing, repairing and troubleshooting of various heating and cooling equipment. Students will work with industrial standard tools associated with equipment such as oil and gas furnaces, refrigeration units, and air conditioning equipment.

Career Opportunities

Employment opportunities consist of HVAC installers, controls technicians, service technicians, maintenance mechanics, plumbers, engineers, programmers, research development, management, sales, and dispatch. But let's be clear - this is an exciting, evolving field that requires hard work, dedication, innovation and creative problem solving.

Program Learning Goals:

Goal 1: Graduates will possess the skills necessary to obtain an entry-level HVAC Technician position.

Student Learning Outcomes - Students will:

- Identify HVAC equipment and system components, their functions, and their correlation within a system.
- Install various heating, air conditioning and refrigeration equipment.
- Demonstrate the required skills for installing and piping in a multi zone hydronic heating system.
- Develop and apply competent wiring skills.
- Demonstrate industry specified soldering and brazing techniques.

Goal 2: Graduates will demonstrate safe HVAC practices and obtain an understanding of the significance of safety procedures in the HVAC environment.

Student Learning Outcomes - Students will:

- Perform tasks in accordance with OSHA guidelines
- Exhibit proper usage of personal protective equipment (PPE)
- Demonstrate safe practices while working with a multimeter.

Goal 3: Graduates will be able to perform entry level troubleshooting and preventative maintenance on various heating, air conditioning and refrigeration systems.

Student Learning Outcomes - Students will:

- Demonstrate entry-level diagnostic and service procedures for residential and light commercial air conditioning systems, such as split systems, ductless systems, and package units.
- Demonstrate entry-level diagnostic and service procedures for residential and light commercial heating systems, such as furnaces, boilers, heat pumps, and roof top units.
- Demonstrate entry-level diagnostic and service procedures for residential and light commercial refrigeration systems, such as walk-in coolers, icemakers, and freezers.

Heating, Ventilation, & Air Conditioning Technology

Major Courses

BTT ###	Construction Elective	3
BTT ###	Construction Elective	3
BTT 103	Introduction to Pipefitting	2
BTT 105	Introduction to Electricity for the Trades	1
BTT 106	Introduction to Electricity for the Trades Lab	2
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
BTT 251	Motors and Controls	2
BTT 252	Motors and Controls Lab	4
HAC 189	Refrigeration	2
HAC 190	Refrigeration Lab	4
HAC 283	Heating System Design & Installation	2
HAC 284	Heating System Design & Installation Lab	4
HAC 285	Air Conditioning Systems	2
HAC 286	Air Conditioning Systems Lab	2
HAC 290	Applied Practice and Special Topics Lab	4
or INT 299	Internship	

Core Career Courses

ART 110	Contract Drawings	3
BUS 101	Introduction to Business	3
or CSM 105	Customer Service and Our World	
COM ###	Communication Elective	3
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
SCI ###	Science Elective	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate	62
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Heating, Ventilation, & Air Conditioning Technology

Associate in Applied Science (A.A.S.)

Semester Program Outline

Semester 1		Credits
BTT 103	Introduction to Pipefitting	2
BTT 105	Introduction to Electricity for the Trades	1
BTT 106	Introduction to Electricity for the Trades Lab	2
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
SSS 101	First-Year Experience	1
		15
Semester 2		
ART 110	Contract Drawings	3
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
HAC 189	Refrigeration	2
HAC 190	Refrigeration Lab	4
SCI ###	Science Elective	3
		15
Semester 3		
BTT ###	Construction Elective	3
COM ###	Communication Elective	3
HAC 283	Heating System Design & Installation	2
HAC 284	Heating System Design & Installation Lab	4
HAC 285	Air Conditioning Systems	2
HAC 286	Air Conditioning Systems Lab	2
		16
Semester 4		
BUS 101	Introduction to Business	3
or CSM 105	Customer Service and Our World	
BTT ###	Construction Elective	3
BTT 251	Motors and Controls	2
BTT 252	Motors and Controls Lab	4
HAC 290	Applied Practice and Special Topics Lab	4
or INT 299	Internship	
		16
Minimum Credits to Graduate		62

Heating, Ventilation, & Air Conditioning Technology

Course Descriptions

Course No.	Course Title	Credits
BTT 103	Introduction to Pipefitting This introductory pipefitting course provides students with a basic understanding of the materials, processes and tools used in residential and light commercial applications. Students will learn safe-work practices, as well as common components and fixtures that are installed in various settings.	2
BTT 105	Introduction to Electricity for the Trades This course provides introductory information and practical experience in installation of basic electrical systems in residential and commercial applications. This course will demonstrate proper usage of both electrical hand tool and power tools. This course will discuss basic electrical theories and codes.	1
BTT 106	Introduction to Electricity for the Trades Lab This course provides introductory information and practical experience in installation of basic electrical systems in residential and commercial applications. This course will demonstrate proper usage of both electrical hand tool and power tools. This course will discuss basic electrical theories and codes. Lab times for this course will be scheduled both on and off campus. (Co-requisite: BTT 105)	2
BTT 151	Fundamentals of Electricity This course covers general safety principles, basic construction guidelines, and laws governing electricity emphasizing theoretical concepts. Fundamentals such as Ohm's Law as it relates to DC and AC circuits will be covered in depth. Electrical components such as resistors, capacitors, and inductors will be examined.	2
BTT 152	Fundamentals of Electricity Lab This course covers general safety principles, basic construction guidelines and laws governing electricity, basic hand tool usage, print reading, electrical safety, circuit construction and operation. This course will also begin to outline use and interpretation of the National Electrical Code (NEC). (Co-requisite: BTT 151)	1
BTT 251	Motor and Controls This course covers the fundamental concepts of motors and motor controls. Topics include ladder diagrams, pilot devices, contactors, motor starters, motors, and other control devices. This course also covers service and repair principles and practices for industrial electrical systems, industrial electronic devices, programmable controllers, welding, boilers, HVAC, mechanical and pneumatic and fluid power systems. Upon completion, students will be able to properly select, connect, and troubleshoot motors and control circuits. (<i>Prerequisite:</i> BTT 151, BTT 152)	2
BTT 252	Motor and Controls Lab This course provides students with the opportunity to apply the theory and concepts covered in BTT 251. Students will practice working with ladder diagrams, pilot devices, contactors, motor starters, motors, and other control devices. They will also work with industrial electrical systems, industrial electronic devices, programmable	4

controllers, welding, boilers, HVAC, mechanical and pneumatic and fluid power systems. Upon completion, students will be able to properly select, connect, and troubleshoot motors and control circuits. (*Prerequisite:* BTT 151, BTT 152; *Co-requisite:* BTT 251)

- | | | |
|----------------|--|----------|
| HAC 189 | Refrigeration | 2 |
| | This course familiarizes the students with safety procedures, tools and materials, principles of operation, and real-world applications relevant to refrigeration. Students will become familiar with the pressure temperature relationship and the refrigeration cycle. This course will cover various refrigeration equipment including items such as household refrigerators, reach- in, walk-in, prep tables and icemakers. Students will also discuss preventative maintenance and troubleshooting techniques on various refrigeration equipment. (<i>Co-requisite:</i> HAC 190) | |
| HAC 190 | Refrigeration Lab | 4 |
| | This course provided the opportunity for students to apply the theory and concepts of HAC 189. Students will practice safety procedures while using tools and materials to apply principles of operation and applications relevant to refrigeration. Students will troubleshoot, maintain and repair various refrigeration units. (<i>Co-requisite:</i> HAC 189) | |
| HAC 283 | Heating System Design & Installation | 2 |
| | This course covers the study of various hydronic and forced air systems. Students will discuss installation, order of operation, startup procedures, combustion analysis, and zoning options. This course also covers the study of natural gas, propane, fuel oil and electric heating systems. Heat loss formulas are studied, and used to determine the heating needs within a variety of climate zones. Students will also discuss preventative maintenance and troubleshooting techniques on various heating systems. (<i>Prerequisites:</i> BTT 103, BTT 151, BTT 152; <i>Co-requisite:</i> HAC 284) | |
| HAC 284 | Heating System Design & Installation Lab | 4 |
| | This course provides the opportunity for students to apply the theory and concepts of HAC 283 Heating System Design & Installation. Students will practice safety procedures while using tools and materials to apply principles of operation and applications relevant to heating systems. Students will install, troubleshoot, maintain, and repair various heating systems. (<i>Prerequisites:</i> BTT 103, BTT 151, BTT 152; <i>Co-requisite:</i> HAC 283) | |
| HAC 285 | Air Conditioning Systems | 2 |
| | This course exposes the students to the design, operation and installation of various Air Conditioning and Heat pump systems. All of the systems' components are studied in relation to their compatibility for ventilation, air handling and climate control. Students will also discuss installation, troubleshooting and preventative maintenance techniques on various systems. (<i>Prerequisites:</i> BTT 151, BTT 152, HAC 189, HAC 190; <i>Co-requisite:</i> HAC 286) | |
| HAC 286 | Air Conditioning Systems Lab | 2 |
| | This course allows the student to apply the concepts covered in HAC 285. Students will design, operate, and install air conditioning systems. Students will calculate the | |

appropriate formulas to meet specifications and to comply with codes. (*Prerequisites:* BTT 151, BTT 152, HAC 189, HAC 190; *Co-requisite:* HAC 285)

HAC 290	Applied Practice and Special Topics Lab	4
	This course allows the student to apply the concepts covered in previous HAC courses. Students will apply diagnostic techniques in all areas of previous study. Students are expected to hone the specific skills to prepare them for entry-level positions upon graduation. (<i>Prerequisites:</i> Must complete the first three semesters of classes)	

Electronic and Industrial Division -

Advanced Manufacturing Technology (AAS)

Program Objective

The Advanced Manufacturing Technology program is designed to prepare students for the modern manufacturing environment of today. This program will prepare students for entry level positions within companies that have implemented team-oriented design, production, quality, and maintenance systems within the manufacturing environment. The technical courses provide the graduate with a solid foundation of advanced manufacturing procedures. The combination of the Core Career courses and technical courses equip the graduates with the communication, mathematics, and problem solving skills necessary to perform in the modern workplace.

Career Opportunities

American manufacturers are becoming increasingly dependent upon the use of high-tech equipment that involves multiple, integrated systems. It is critical that these companies be able to recruit and employ individuals who know how to operate, troubleshoot, and maintain this high-tech equipment.

Program Learning Goals:

Goal 1: Graduates will possess the skills necessary to obtain entry-level technical positions in the manufacturing environment.

Student Learning Outcomes - Students will:

- Demonstrate the knowledge of work environment, behavior and dress
- Demonstrate the ability to properly choose and wear personal protective equipment (PPE)
- Demonstrate correct and safe hand tool use

Goal 2: Graduates will be able to troubleshoot electrical, electronic, and mechanical systems using theoretical principles and measured values to resolve operational issues.

Student Learning Outcomes - Students will:

- Demonstrate competence in digital multimeter use
- Recognize the effects of mechanical malfunctions
- Employ corrective actions to make repairs to systems under test

Goal 3: Graduates will demonstrate the ability to communicate in a professional manner to determine the nature of a problem or to explain repairs.

Student Learning Outcomes - Students will:

- Describe a malfunction found and propose corrective action to remedy the situation
- Provide written communication on work performed

Goal 4: Graduates will demonstrate the proper and safe use of hand tools, measuring equipment and test equipment used during manufacturing or troubleshooting.

Student Learning Outcomes - Students will:

- Demonstrate correct and accurate use of measuring instruments
- Demonstrate correct use of a multimeter to measure voltage, resistance and current in series, parallel and series/parallel circuits.

Goal 5: Graduates will possess the skills necessary to correctly and safely operate machines used in the production of mechanical parts.

Student Learning Outcomes - Students will:

- Demonstrate the ability to safely setup and operate manual lathes, mills and CNC machines

Advanced Manufacturing Technology Major Courses

AMT 151	Fundamentals of Metal Cutting	2
AMT 152	Fundamentals of Metal Cutting Lab	1
AMT 155	Introduction to Electricity	2
AMT 156	Introduction to Electricity Lab	1
AMT 113	Subtractive Manufacturing Lathe	1
AMT 114	Subtractive Manufacturing Lathe Lab	2
AMT 115	Subtractive Manufacturing Milling	1
AMT 116	Subtractive Manufacturing Milling Lab	2
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
MEC 157	Sensors and Systems in Automation	2
MEC 158	Sensors and Systems in Automation Lab	1
WTC 151	Shielded Metal Arc Welding	2
WTC 152	Shielded Metal Arc Welding Lab	4
AMT 215	Computer Numerical Control Machining- Lathe	1
AMT 216	Computer Numerical Control Machining- Lathe Lab	2
AMT 217	Computer Numerical Control Machining- Milling	1
AMT 218	Computer Numerical Control Machining- Milling Lab	2
MEC 245	Programmable Logic Controllers	2
MEC 246	Programmable Logic Controllers Lab	2
AMT 257	Computer Aided Design/Computer Aided Manufacturing	2
AMT 258	Computer Aided Design/Computer Aided Man. Lab	1
AMT 265	Manufacturing Management	1
AMT 266	Manufacturing Management Lab	3
or INT 299	Internship	4
LOG 291	Total Quality Management	3

Core Career Courses

ART 105	Blueprint / Schematic Reading	3
BUS 101	Introduction to Business	3
COM 112	Public Speaking	3
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
MAT 121	Introduction to Statistics	3
PHY 101	Introductory Physics	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate 66

**Advanced Manufacturing Technology
Associate in Applied Science (AAS)
Semester Program Outline**

Semester 1		Credits
AMT 151	Fundamentals of Metal Cutting	2
AMT 152	Fundamentals of Metal Cutting Lab	1
ART 105	Blueprint / Schematic Reading	3
WTC 151	Shielded Metal Arc Welding	2
WTC 152	Shielded Metal Arc Welding Lab	4
MAT 101	College Algebra I and Trigonometry	3
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
SSS 101	First-Year Experience	1
		19
Semester 2		
AMT 113	Subtractive Manufacturing Lathe Work	1
AMT 114	Subtractive Manufacturing Lathe Work Lab	2
AMT 115	Subtractive Manufacturing Milling Work	1
AMT 116	Subtractive Manufacturing Milling Work Lab	2
MEC 157	Sensors and Systems in Automation	2
MEC 158	Sensors and Systems in Automation Lab	1
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
COM 112	Public Speaking	3
		18
Semester 3		
AMT 215	Computer Numerical Control Machining- Lathe	1
AMT 216	Computer Numerical Control Machining- Lathe Lab	2
AMT 217	Computer Numerical Control Machining- Milling	1
AMT 218	Computer Numerical Control Machining- Milling Lab	2
MEC 245	Programmable Logic Controllers	2
MEC 246	Programmable Logic Controllers Lab	2
BUS 101	Introduction to Business	3
MAT 121	Introduction to Statistics	3
		16
Semester 4		
AMT 257	Computer Aided Design / Computer Aided Manufacturing	2
AMT 258	Computer Aided Design / Computer Aided Man. Lab	1
PHY 101	Introductory Physics	3
AMT 265	Manufacturing Management	1
AMT 266	Manufacturing Management Lab	3
or INT 299	Internship	4
LOG 291	Total Quality Management	3
		13
Minimum Credits to Graduate		66

Advanced Manufacturing Technology Course Descriptions

Course No.	Course Title	Credits
AMT 101	Principles for Advanced Manufacturing This course introduced the students to advanced manufacturing and the man areas into which it is incorporated. The focus of the course will be on manufacturing processes, CAD/CAM basics, robotics, sustainable design and manufacturing, and related manufacturing principles. The course is designed to give the students an understanding of advanced manufacturing's main applications, and the many occupational possibilities it presents.	3
AMT 113	Subtractive Manufacturing Lathe Work Safety, cutting speeds, types of lathes, lathe accessories, lathe operation, and measuring instruments are covered in this course. Lathe operations covered include facing, turning, center drilling, reaming, boring, tapering, knurling, and thread chasing. Technical competence in the use of measuring instruments is also stressed. (<i>Prerequisite:</i> AMT 151, AMT 152)	1
AMT 114	Subtractive Manufacturing Lathe Work Lab Safety, cutting speeds, types of lathes, lathe accessories, lathe operation, and measuring instruments are covered in this course. Lathe operations covered include facing, turning, center drilling, reaming, boring, tapering, knurling, and thread chasing. (<i>Co-requisite:</i> AMT 113)	2
AMT 115	Subtractive Manufacturing Millwork Information about safety, types of milling machines, milling machine attachments, milling operations are covered in this course. Milling operations include squaring a piece, locating holes, drilling operations, and milling slots. Technical competence in the use of measuring instruments is also stressed. (<i>Prerequisite:</i> AMT 151, AMT 152)	1
AMT 116	Subtractive Manufacturing Millwork Lab Information about safety, types of milling machines, milling machine attachments, milling operations are covered in this course. Milling operations include squaring a piece, locating holes, drilling operations, and milling slots. Technical competence in the use of measuring instruments is also stressed. (<i>Co-requisite:</i> AMT 115)	2
AMT 151	Fundamentals of Metal Cutting This course covers machine trades theory including safety practices and working concepts of hand tools, bandsaws, belt sanders, pedestal grinders, drill presses, and cutting tools. It explains various material modification applications including hand tools, cutting, deburring, sharpening, grinding, and various cutting tools. Measuring instruments are also stressed throughout this course.	2
AMT 152	Fundamentals of Metal Cutting Lab This course covers machine trades theory including safety practices and working concepts of hand tools, bandsaws, belt sanders, pedestal grinders, drill presses, and cutting tools. It provides practical applications from the lecture via projects. (<i>Co-requisite:</i> AMT 151)	1

AMT 215	Computer Numerical Control Machining- Lathe	1
	This course covers the general information, such as G codes and M codes needed to program CNC lathes. CNC lathe safety procedures, tooling set-up, programming, and operation theory are covered in the course. Tool offsets are also covered in this course. (<i>Prerequisites:</i> AMT 151, AMT 152, AMT 113 AMT 114)	
AMT 216	Computer Numerical Control Machining- Lathe Lab	2
	This course covers the general information, such as G codes and M codes needed to program CNC lathes. CNC lathe and safety procedures, tooling set-up, programming, and operation theory are covered in the course. Touching off tools, entering programs and running programs are practiced in this course. Tool offsets are also covered in this course. (<i>Co-requisite:</i> AMT 252)	
AMT 217	Computer Numerical Control Maching- Milling	1
	This course covers the general information, such as G codes and M codes needed to program CNC Milling machines. CNC Milling machine safety procedures, tooling set-up, programming, and operation theory are covered in the course. Tool offsets are also covered in this course. (<i>Prerequisites:</i> AMT 151, AMT 152, AMT 115, AMT 116).	
AMT 218	Computer Numerical Control Maching- Milling Lab	2
	This course covers the general information, such as G codes and M codes needed to program CNC lathes. CNC lathe and safety procedures, tooling set-up, programming, and operation theory are covered in the course. Touching off tools, entering programs and running programs are practiced in this course. Tool offsets are also covered in this course. (<i>Co-requisite:</i> AMT 217)	
AMT 257	Computer Aided Design/Computer Aided Manufacturing	1
	This course introduces the students to the use of Computer Aided Design (CAD) software to create 2 D geometry. Once the 2D geometry is complete tool paths are created to machine parts, editing tool paths, and downloading appropriate information to CNC and machine. (<i>Prerequisite:</i> AMT 251, AMT 252)	
AMT 258	Computer Aided Design / Manufacturing Lab	2
	This course instructs the student in the application of CAD/CAM with CNC equipment. Students learn to create part models using Solidworks and then write machining code using Mastercam. CNC machines are setup by the students to create the parts. Once parts are completed, students are instructed on inspection and quality control of the parts. (<i>Prerequisite:</i> AMT 251, AMT 252; <i>Co-requisite:</i> AMT 257)	
BTT 151	Fundamentals of Electricity	2
	This course covers general safety principles, basic construction guidelines, and laws governing electricity emphasizing theoretical concepts. Fundamentals such as Ohm's Law as it relates to DC and AC circuits will be covered in depth. Electrical components such as resistors, capacitors, and inductors will be examined.	
BTT 152	Fundamentals of Electricity Lab	1
	This course covers general safety principles, basic construction guidelines and laws governing electricity, basic hand tool usage, print reading, electrical safety, circuit	

construction and operation. This course will also begin to outline use and interpretation of the National Electrical Code (NEC). (Co-requisite: BTT 151)

- | | | |
|----------------|---|----------|
| MEC 157 | Sensors and Systems in Automation | 2 |
| | This course will introduce the students to common types of detection sensors used in automation. The theory of operation, setup in control circuits and troubleshooting will also be covered. The course will also introduce the student to pneumatic and hydraulic systems used in the industrial setting for control of actuators and grippers in an automated system. (<i>Prerequisites:</i> EET 161, EET 162, MEC 155, MEC 156; <i>Co-requisite:</i> MEC 157) | |
| MEC 158 | Sensors and Systems in Automation Lab | 1 |
| | This course will introduce the students to common types of detection devices used in automation through hands on experimentation. The student will set-up, operate and troubleshoot practical problems in a laboratory setting. The course will also introduce the student to pneumatic and hydraulic systems used in the industrial setting for control of actuators and grippers in an automated system. The student will work with hydraulic and pneumatic systems to deal with the concepts of setup and integration of these systems into the larger control scheme of an automated system (<i>Prerequisites:</i> EET 161, EET 162, MEC 155, MEC 156; <i>Co-requisite:</i> MEC 157) | |
| MEC 245 | Programmable Logic Controllers I | 2 |
| | This course is designed to introduce the student to modern programmable logic controllers base on Control Logix and Compact Logix Programmable Automation Controllers (PAC's). The student will investigate the specification, setup, configuration, programming, and implementation of the controller. The course then continues with an examination of the different types of hardware devices that are used in conjunction with PAC's. An emphasis is placed on programming projects throughout the course. (<i>Co-requisite:</i> MEC 246, MEC 243, MEC 244) | |
| MEC 246 | Programmable Logic Controllers I Lab | 2 |
| | The student will investigate the setup, configuration, programming, and implementation of the controllers through lab exercises designed to have the student build a system from beginning to end. As the student progresses through this course the experiments will progressively build toward real world applications. (<i>Co-requisite:</i> MEC 245, MEC 243, MEC 244) | |
| WTC 151 | Shielded Metal Arc Welding | 2 |
| | This course is designed to teach the student the basic safety, principles, practices, and applications of SMAW. This course covers welding trade theory including safety, tool usage, equipment set up and standard terms and definitions. Basic welding and cutting techniques in the flat, horizontal, vertical and overhead position, tank safety and welding safety will be taught. The course also covers basic metallurgy and how to identify weld problems and defects. This course will progress to the most advanced SMAW practices with concentration on vertical and overhead welding techniques conforming to the AWS structural welding code. Weld problems, corrections and specific techniques will be covered in this course. | |

WTC 152**Shielded Metal Arc Welding Lab****4**

This course is designed to allow students to apply the theory and techniques taught in WTC151 Shielded Metal Arc Welding. Student will practice basic safety, principles, practices, and applications of SMAW, basic welding and cutting techniques in various positions. Weld problems, corrections and specific techniques will also be practiced in this course. (*Co-requisite*: WTC 152)

Electronic and Industrial Division -

Biomedical Equipment Technology (AAS)

Program Objective

The Biomedical Equipment Technology program prepares students as entry-level biomedical technicians with skills training that include medical terminology and human physiology principles, as well as the maintenance and support, planning and acquisition, and installation of medical equipment according to standards and guidelines.

Career Opportunities

Graduates work as technicians and sales representatives in the field of Healthcare Technology Management (HTM). Typical employers in this field are hospitals; medical centers; contract maintenance firms; dental, medical, and optical facilities; computer, electronic and medical instrumentation manufacturers.

Program Learning Goals:

Goal 1: Students will achieve, through study and hands-on learning, the skills necessary to obtain an entry-level Biomedical Technician position when they graduate.

Student Learning Outcomes - Students will:

- Demonstrate the professionalism, knowledge, skills and abilities (KSA's) required of a BMET while completing a 200 hour biomedical internship.
- Acquire the broad knowledge necessary for success as a Biomedical Technician in their core (EET and BET) freshman and sophomore studies.
- Demonstrate competency in routine biomedical maintenance tasks by the end of their final semester.

Goal 2: Students will prove their knowledge of and ability to perform many equipment management tasks required in the Healthcare Technology Management (HTM) field prior to graduation.

Student Learning Outcomes - Students will:

- Demonstrate skills in using a computerized medical maintenance software system through successfully completing assigned labs that include inventory, work order generation and completion, and preventative maintenance scheduling
- Demonstrate competence in HTM tasks such as completing acceptance inspections for new equipment, determining preventative maintenance requirements, rating a device's risk level depending on equipment function and location within the healthcare environment, etc.

Goal 3: Students will prove competence with biomedical test equipment and basic testing techniques on common medical devices through hands-on competency tests.

Student Learning Outcomes - Students will:

- Demonstrate skills with specialized biomedical test equipment by passing the Capstone Practical Test with a grade of 80% or higher.
- Demonstrate knowledge and skills required to verify performance per manufacturer's specifications of several selected medical devices by passing the Capstone Practical Test with a grade of 80% or higher.

Special Enrollment Requirements

Prior to the start of the first semester, students must provide proof of a criminal background check and hepatitis B vaccination. Proof of a PPD two-step testing (TB test) is required prior to the start of the student's second year.

Internship

A 200 hour internship at an approved site may be completed after a student has completed 30 credits and receives approval from the Program Director. Students are required to complete an internship, and must satisfy the internship requirements of both Johnson College and the internship provider as a condition of graduation. Students must have a cumulative GPA of 2.00 to meet the minimum qualification for internship through Johnson College. Some internship sites may require students to obtain a higher GPA in their agreement.

Many internship sites require proof of current health care coverage, criminal, child abuse and FBI background checks, and/or drug and nicotine tests. Internship sites may bar students from an internship if a criminal record exists or a drug/nicotine test has a positive result. Johnson College cannot guarantee internship placement. Costs for travel to and from an internship site are the responsibility of the student. The schedule for meeting the requirements of this experience will be arranged between the student, faculty member and internship site.

Biomedical Equipment Technology Major Courses

EET 161	DC Electricity and Instrumentation	2
EET 162	DC Electricity and Instrumentation Lab	1
EET 163	Alternating Current and Passive Devices	2
EET 164	Alternating Current and Passive Devices Lab	1
EET 165	Digital Electronics	2
EET 166	Digital Electronics Lab	2
EET 167	Introduction to Semiconductors	2
EET 168	Introduction to Semiconductors Lab	1
EET 169	Integrated Circuits & Thyristors	2
EET 170	Integrated Circuits & Thyristors Lab	1
BET 231	Medical Equipment Standards and Testing	2
BET 232	Medical Equipment Standards and Testing Lab	2
BET 233	Physiological Monitoring Devices	2
BET 234	Physiological Monitoring Devices Lab	2
BET 235	Life Support Systems	2
BET 236	Life Support Systems Lab	2
BET 237	Specialized Medical Systems	2
BET 238	Specialized Medical Systems Lab	1
BET 299	Internship	4
BIO 105	Physiology and Anatomy	3
CIT 183	Network Architectures, Principles, and Protocols	2
CIT 184	Network Architectures, Principles, and Protocols Lab	1
PHY 101	Introductory Physics	3

Core Career Courses

ART ###	Art Elective	3
CHM 101	Fundamentals of Chemistry	3
CHM 102	Fundamentals of Chemistry Lab	1
COM 112	Public Speaking	3
CPT 101	Microcomputer I	3
CSM 105	Customer Service and Our World	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 110	Trigonometry	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate **67**

Biomedical Equipment Technology

Associate in Applied Science (AAS)

Semester Program Outline

Semester 1		Credits
EET 161	DC Electricity and Instrumentation	2
EET 162	DC Electricity and Instrumentation Lab	1
EET 163	Alternating Current and Passive Devices	2
EET 164	Alternating Current and Passive Devices Lab	1
EET 165	Digital Electronics	2
EET 166	Digital Electronics Lab	2
CHM 101	Fundamentals of Chemistry	3
CHM 102	Fundamentals of Chemistry Lab	1
MAT 110	Trigonometry	3
SSS 101	First-Year Experience	1
		18
Semester 2		
EET 167	Introduction to Semiconductors	2
EET 168	Introduction to Semiconductors Lab	1
EET 169	Integrated Circuits & Thyristors	2
EET 170	Integrated Circuits & Thyristors Lab	1
BIO 105	Physiology and Anatomy	3
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
PHY 101	Introductory Physics	3
		18
Semester 3		
BET 231	Medical Equipment Standards and Testing	2
BET 232	Medical Equipment Standards and Testing Lab	2
BET 233	Physiological Monitoring Devices	2
BET 234	Physiological Monitoring Devices Lab	2
CIT 183	Network Architectures, Principles, and Protocols	2
CIT 184	Network Architectures, Principles, and Protocols Lab	1
CSM 105	Customer Service and Our World	3
		14
Semester 4		
BET 235	Life Support Systems	2
BET 236	Life Support Systems Lab	2
BET 237	Specialized Medical Systems	2
BET 238	Specialized Medical Systems Lab	1
COM 112	Public Speaking	3
ART ###	Art Elective	3
		13
Semester 5		
BET 299	Internship	4
Minimum Credits to Graduate		67

Biomedical Equipment Technology Course Descriptions

Course No.	Course Title	Credits
BET 231	Medical Equipment Standards and Testing The student learns the requirements and methods of testing medical equipment for conformance with current standards of the Biomedical industry, also known as Healthcare Technology Management (HTM). Students learn the hierarchy of statutes, regulations, standards including accreditation standards, and hospital policies for healthcare equipment management and safety. Students learn principles of electrical safety testing, HTM and medical ethics as they pertain to the Biomedical Technician. Equipment management principles that maximize life span and minimize life-cycle costs are stressed. Sustainable practices to minimize resource and chemical use are also emphasized. (<i>Prerequisite:</i> EET165, EET 166)	2
BET 232	Medical Equipment Standards and Testing Lab Students perform extensive equipment testing to verify conformance with national standards and manufacturer's specifications. Students learn standard practices for electrical safety testing, and conformance with industry standards, manufacturer's specifications as they pertain to the HTM field. Extensive testing of medical devices including centrifuges, IV pumps and physical therapy devices is practiced with students proving their skills in performance tests. Equipment management software inventory and work order entry are practiced to prepare the student with entry-level HTM skills. (<i>Prerequisite:</i> EET 165, EET 166) (<i>Co-requisite:</i> BET 231)	2
BET 233	Physiological Monitoring Devices This course explains many hazards encountered in the hospital environment and the role of the BMET in controlling them. It continues by discussing the different types of transducers and electrodes used with biomedical equipment. The cardiovascular system is prominent as the student learns the principles of electrocardiography and blood pressure measurement. The course concludes by examining ECG and pressure monitors, as well as the principles of other bedside monitoring parameters, and the types of specialized test equipment used in HTM to test and verify accuracy of these medical devices. (<i>Prerequisite:</i> EET 165, EET 166)	2
BET 234	Physiological Monitoring Devices Lab The course concludes by examining ECG and pressure monitors, concentrating on the test equipment used to test and verify accuracy. Specialized test equipment is used in hands-on training. Extensive testing of medical devices such as ECG, blood pressure, pulse oximetry and capnography is stressed with students proving their skills in performance tests. Equipment management software inventory and work order entry are practiced to prepare the student with entry-level HTM skills. (<i>Prerequisite:</i> EET 165, EET 166; <i>Co-requisite:</i> BET 234)	2
BET 235	Life Support Systems This course is an overview of the types of medical equipment needed to support patients who have life threatening problems. Examples of such equipment are defibrillators, pacemakers, ventilators and hemodialysis units. The function of each type of equipment is discussed. Some pieces of equipment are examined thoroughly	2

in relation to functional testing, preventive maintenance, parts identification, and description of circuits. A mock certification exam is the capstone of this course. (*Prerequisite:* EET 165, EET 166)

- BET 236 Life Support Systems Lab 2**
Extensive testing of medical devices including defibrillators, external pacers, ventilators, and electrosurgical units is practiced with students proving their skills in performance tests. Specialized test equipment is used in hands-on training. Equipment management software inventory and work order entry are practiced to prepare the student with entry-level HTM database skills. (*Prerequisite:* EET 165, EET 166; *Co-requisite:* BET 235)
- BET 237 Specialized Medical Systems 2**
This course describes the different types of specialized medical equipment found in the hospital environment. Lasers, x-ray, ultrasound imaging and nuclear imaging equipment are examples of the modalities covered. The basic theory and function of each system is explained with emphasis on quality control, patient and personal safety. (*Prerequisite:* EET 165, EET 166)
- BET 238 Specialized Medical Systems Lab 1**
Lab experiments include video system setup and testing, diagnostic ultrasound familiarization and quality control checks, x-ray system familiarization and quality control checks and video display quality control checks. Equipment management software inventory and work order entry are practiced to prepare the student with entry-level HTM skills. Students prove acquired skills in hands-on performance tests. (*Prerequisite:* EET 165, EET 166; *Co-requisite:* BET 237)
- BET 299 Internship 4**
Students work for 200 hours in a health care facility or medical equipment repair facility after completing 50 credit hours, having a cumulative GPA of 2.00, and meeting all other program prerequisites and academic requirements prior to their final spring semester. The internship offers students applied healthcare technology management and service experience. In the internship, the student performs preventive maintenance, safety analysis, and minor repairs on selected pieces of medical equipment. Students are expected to adhere to all policies and regulations associated with their internship facility. The schedule for meeting the requirement of this experience will be arranged between the student, faculty member and internship site. (*200 hours*)
- CIT 183 Network Architectures, Principles, and Protocols 2**
Introduces software and hardware requirements needed to perform technical support, diagnostics, and application of solutions so that communication can be achieved across a constructed network. Students will learn about various network architectures, topologies considered in the field, the principles of network communication and data transferring over a network, and the necessary protocols to provide understanding on how a network functions based on operations. In addition, students will be learn about media access techniques, network mediums, cable assessment, and conduct mechanics toward Internet Protocol (IP) addressing. The course will help prepare students with theoretical information from texts, presentations, and test builders for the CompTIA Network+ certification examination.

CIT 184	Network Architectures, Principles, and Protocols Lab	1
	The lab provides students with practices not limited to vendor-neutral hands-on tasks necessary to mock-up, design, and develop network implementations. This includes, design, installation, and technical support to modern network systems. Additionally, the lab prepares students to construct network medium, and conduct testing for signal assurance. The course will also demonstrate safety procedures, and environmental skills to support problem solving, communication, and professionalism in handling real-world experience problems experienced in computer network settings. The lab will help prepare students with hands-on practices and resources providing information from referential sources significantly correlating to the CompTIA Network+ certification examination.	
EET 161	DC Electricity and Instrumentation	2
	This course introduces the student to the theory and operation of basic DC circuits, circuit construction, operation and troubleshooting. Basic alternative energy technologies are introduced. The student will also receive instruction on soldering, digital multi-meter usage, and Ohm's Law applications for testing and troubleshooting electric circuits. Elements of proper disposal of batteries and other circuit components considered to be hazardous waste are included. (<i>Co-requisite:</i> EET 162)	
EET 162	DC Electricity and Instrumentation Lab	1
	This course applies the theory taught in EET 161 through hands on building and testing of basic electric circuits. The student will also gain practical experience in soldering, digital multi-meter usage, and Ohm's Law applications for testing and troubleshooting the electric circuits they build. Elements of proper disposal of batteries and other circuit components considered hazardous waste are emphasized throughout this course. (<i>Co-requisite:</i> EET 161)	
EET 163	Alternating Current and Passive Devices	2
	This course introduces the student to circuitry basic to AC electrical theory. It identifies the fundamental differences between AC and DC energy sources and circuit components. It also introduces oscilloscope usage, AC units, nomenclature and electromagnetism. The course will also cover inductors, transformers, and capacitors and their effects in AC circuits. Work place energy efficiency and conservation habits are included. The concepts of RCL circuits and their use as passive filters will be covered. (<i>Co-requisite:</i> EET 164)	
EET 164	Alternating Current and Passive Devices Lab	1
	This course applies the theory taught in EET 163 through hands on building and testing of basic AC circuits. The student will use oscilloscopes and digital meters to measure amplitude, frequency and phase of an AC signal. As the student progresses through the course, test equipment will be used to test transformers, inductive circuits, capacitive circuits, and passive filters. The student will also be introduced to troubleshooting techniques and have time to practice those techniques on circuits they build. (<i>Co-requisite:</i> EET 163)	
EET 165	Digital Electronics	2
	This course begins by familiarizing the student with the fundamental gates, numbering systems and simplification techniques used for the implementation of digital circuitry. It continues by introducing the student to the different digital codes, seven segment displays and flip-flops with emphasis placed on schematic interpretation,	

nomenclature and troubleshooting. This course continues with the investigation of the circuits used for counters, registers, arithmetic logic circuits and digital to analog interfacing. It examines the circuitry of each section with emphasis on circuit timing, characteristic waveforms and troubleshooting. (*Co-requisite*: EET 166)

- | | | |
|----------------|--|----------|
| EET 166 | Digital Electronics Lab | 2 |
| | This course is designed to provide the student with hands on testing and troubleshooting of the digital circuits discussed in EET 169. The circuits investigated will begin with basic logic gates and continue through flip-flops, counters, and shift registers. The student will be expected to use test equipment, such as the oscilloscope, digital meter and logic probe, to test and troubleshoot the circuits built throughout this course. (<i>Co-requisite</i> : EET 165) | |
| EET 167 | Introduction to Semiconductors | 2 |
| | This course provides an introduction to semiconductor theory, the different types of semiconductor components, their symbols, characteristics, and uses. Basic power supplies, small signal amplifiers, large signal amplifiers and coupling techniques are covered. This course will concentrate on characteristic waveforms, theory and troubleshooting. Practice is provided regarding diodes, transistors and circuit applications. Sustainable practices to minimize resources and chemical use are an integral part of the course. (<i>Prerequisites</i> : EET 161, EET 162, EET 163, EET 164; <i>Co-requisite</i> : EET 168) | |
| EET 168 | Introduction to Semiconductors Lab | 1 |
| | This course provides the student with the opportunity to apply the theoretical concepts from EET 165 to real world circuits. The student will use various pieces of test equipment to verify circuit operation and to troubleshoot circuits that are faulty. At all times safety will be emphasized throughout this course. Some of the circuits included in this course are rectifiers, voltage multipliers, amplifiers from the bipolar junction transistor and the field effect transistor families. The student will use digital meters and oscilloscopes to evaluate the operational performance of the circuits used in this course. (<i>Prerequisites</i> : EET 161, EET 162, EET 163, EET 164; <i>Co-requisite</i> : EET 167) | |
| EET 169 | Integrated Circuits and Thyristors | 2 |
| | This course provides an introduction to integrated circuits through the operational amplifier, its characteristics and configurations. Amplifier troubleshooting is included, highlighting methods of determining causes of failures and locating problems. This study of integrated circuits will continue by investigating the operation of integrated voltage regulators and the 555 universal timer. The thyristors family of electronic components is introduced through lecture to identify the characteristics, circuitry, and methods of troubleshooting this family of components. (<i>Prerequisites</i> : EET 161, EET 162, EET 163, EET 164; <i>Co-requisite</i> : EET 170) | |
| EET 170 | Integrated Circuits and Thyristors Lab | 1 |
| | This course will provide the student the opportunity to work with operational amplifiers integrated voltage regulators and 555 universal timers. These devices and others will be used to build and troubleshoot amplifiers, active filters and power supply circuits. The thyristors family of electronic components is also investigated through experimentation, testing and troubleshooting. (<i>Prerequisites</i> : EET 161, EET 162, EET 163, EET 164; <i>Co-requisite</i> : EET 169) | |

Electronic and Industrial Division -

Computer Information Technology (AS)

Program Objective

The Computer Information Technology Program prepares students as entry-level technicians for the maintenance, repair, and troubleshooting of the hardware and software used in today's local and wide area computer networking and information systems.

Career Opportunities

Typical employers are any business or industry using information technology today. Some examples of these are banks, hospitals, educational institutions, government facilities, mail order facilities, retail chains, school districts, and manufacturing facilities. Students work with current industry standard computers, and computer networks.

Program Learning Goals:

Goal 1: Graduates will possess the appropriate skills needed for entering the Computer Information Technology field.

Student Learning Outcomes - Students will:

- Assemble, performance test, troubleshoot, repair, maintain and secure personal computers and servers.
- Design, install, performance test, troubleshoot, repair and maintain Local and Wide area networks.

Goal 2: Graduates will learn the importance of good communications skills with all areas of a project.

Student Learning Outcomes - Students will:

- Interpret measures used to resolve a computer related problem and translate them into Layman's terms for the service report.
- Interpret inter-team communications in order to help build a customer network.
- Organize and manage team meetings in order to develop an IP address design for new networks.

Goal 3: Graduates will develop critical thinking skills for troubleshooting various hardware and software issues.

Student Learning Outcomes - Students will:

- Recognize the importance of safe work habits and conditions
- Interpret customer needs and create a network based on those needs
- Investigate operating system malfunctions, recognize the cause, and develop a plan to resolve the malfunction.

Computer Information Technology Major Courses

CIT 181	Computer Hardware and Operating Systems	2
CIT 182	Computer Hardware and Operating Systems Lab	2
CIT 183	Network Architectures, Principles, and Protocols	2
CIT 184	Network Architectures, Principles, and Protocols Lab	1
CIT 185	TCP/IP Network Design Configuration, Maintenance	2
CIT 186	TCP/IP Network Design Configuration, Maintenance Lab	1
CIT 187	Linux Networking Service and Support	2
CIT 188	Linux Networking Service and Support Lab	1
CIT 189	Information System Security Design, Administration	2
CIT 190	Information System Security Design, Administration Lab	1
CIT 281	LAN/WAN Design and Maintenance Principles	2
CIT 282	LAN/WAN Design and Maintenance Principles Lab	1
CIT 283	Server and Network Operating System Principles	2
CIT 284	Server and Network Operating System Principles Lab	1
CIT 285	Advanced Network Operating System Principles	2
CIT 286	Advanced Network Operating System Principles Lab	1
CIT 289	Web Programming, Server Side Scripting	2
CIT 290	Web Programming, Server Side Scripting Lab	1
CIT 291	AWS Cloud Technologies	3
or INT 299	Internship	4
DAT 201	Database: Principles & Applications	3
DAT 203	Database Management Systems	3
MAT 201	College Algebra II and Trigonometry	3
PRG 101	Programming for the Enterprise	3
PRG 103	C Sharp	3
PRG 205	Programming with Scripting Languages	3

Core Career Courses

ART 115	Web Programming, Client Side Scripting	2
ART 116	Web Programming, Client Side Scripting Lab	1
BUS 105	E-commerce	3
COM 112	Public Speaking	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
SCI ###	Science Elective	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate

68/69

Computer Information Technology

Associate in Science (AS)

Semester Program Outline

Semester 1		Credits
CIT 181	Computer Hardware and Operating Systems	2
CIT 182	Computer Hardware and Operating Systems Lab	2
CIT 183	Network Architectures, Principles, and Protocols	2
CIT 184	Network Architectures, Principles, and Protocols Lab	1
PRG 101	Programming for the Enterprise	3
BUS 105	E-commerce	3
PRG 103	C Sharp	3
SSS 101	First-Year Experience	1
		17
Semester 2		
CIT 185	TCP/IP Network Design Configuration and Maintenance	2
CIT 186	TCP/IP Network Design Configuration and Maintenance Lab	1
CIT 187	Linux Networking Service and Support	2
CIT 188	Linux Networking Service and Support Lab	1
CIT 189	Information System Security Design and Administration	2
CIT 190	Information System Security Design and Administration Lab	1
DAT 201	Database: Principles & Applications	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
		18
Semester 3		
CIT 281	LAN/WAN Design and Maintenance Principles	2
CIT 282	LAN/WAN Design and Maintenance Principles Lab	1
CIT 283	Server and Network Operating System Principles	2
CIT 284	Server and Network Operating System Principles Lab	1
DAT 203	Database Management Systems	3
MAT 201	College Algebra II and Trigonometry	3
PRG 205	Programming with Scripting Languages	3
		15
Semester 4		
ART 115	Web Programming, Client Side Scripting	2
ART 116	Web Programming, Client Side Scripting Lab	1
CIT 285	Advanced Network Operating System Principles	2
CIT 286	Advanced Network Operating System Principles Lab	1
CIT 289	Web Programming, Server-Side Scripting	2
CIT 290	Web Programming, Server-Side Scripting Lab	1
CIT 291	AWS Cloud Technologies	3
or INT 299	Internship	4
COM 112	Public Speaking	3
SCI ###	Science Elective	3
		18/19
Minimum Credits to Graduate		68/69

Computer Information Technology Course Descriptions

Course No.	Course Title	Credits
CIT 181	Computer Hardware and Operating Systems Provides an introduction with computer information technology concepts that include necessary procedures to conduct repairs, troubleshoot, conduct problem-solving techniques, and perform diagnostics to enhance technology maintenance. This includes repairing hardware, analyzing compatibility specifications, providing upgrades to computing devices, establishing network connections, testing device-port accessibility, troubleshooting errors and problems with malfunctioned computing devices, and maintaining the operations of computer operating systems. The course also provides students with information on safety and environmental issues pertaining to communication and professionalism in handling technology assistance in the field. The knowledge gained in this course will also prepare students to take their CompTIA A+ Essentials and Practical Application certification examinations.	2
CIT 182	Computer Hardware and Operating Systems Lab The lab provides fundamental practices and is not limited to essential hands-on skills needed to assemble, disassemble, configure, repair, upgrade, optimize, establish diagnostics and perform preventive maintenance on computer hardware, software, and operating systems. This course will also provide topics in safety and environmental issues as well as communication and professionalism in handling technology support which will help prepare students for CompTIA A+ Essentials and Practical Application certification examinations.	2
CIT 183	Network Architectures, Principles, and Protocols Introduces software and hardware requirements needed to perform technical support, diagnostics, and application of solutions so that communication can be achieved across a constructed network. Students will learn about various network architectures, topologies considered in the field, the principles of network communication and data transferring over a network, and the necessary protocols to provide understanding on how a network functions based on operations. In addition, students will be learn about media access techniques, network mediums, cable assessment, and conduct mechanics toward Internet Protocol (IP) addressing. The course will help prepare students with theoretical information from texts, presentations, and test builders for the CompTIA Network+ certification examination.	2
CIT 184	Network Architectures, Principles, and Protocols Lab The lab provides students with practices not limited to vendor-neutral hands-on tasks necessary to mock-up, design, and develop network implementations. This includes, design, installation, and technical support to modern network systems. Additionally, the lab prepares students to construct network medium, and conduct testing for signal assurance. The course will also demonstrate safety procedures, and environmental skills to support problem solving, communication, and professionalism in handling real-world experience problems experienced in computer network settings. The lab will help prepare students with hands-on practices and resources providing information from referential sources significantly correlating to the CompTIA Network+ certification examination.	1

CIT 185	TCP/IP Network Design Configuration and Maintenance 2 Provides students with a focus on basic and advanced concepts of computer device and network addressing. This course requires students to understand configuration and troubleshooting techniques to enhance performance in Internetworks. Students will be required to understand the TCP/IP model to enhance skills in network design, configuration, and maintenance to expand on implementations, problem-solving, support, and application of solutions. This course will provide fundamental concepts and practices in subnetting to help construct IPv4 and IPv6 based networks. Knowledge gained in this course will prepare students to study for the CompTIA Network+ certification examination.
CIT 186	TCP/IP Network Design Configuration and Maintenance Lab 1 The lab provides students with hands-on practices and experience to understand basic network design, management, maintenance, and support. This lab also helps students enhance design and development skills in network construction to determine IP mechanics and addressing resolution following the TCP/IP model/protocol suite. In addition, students will learn to configure and support important TCP/IP implementations on Microsoft, Linux, and other network operating system based networks. The students will install and support TCP/IP applications and services to construct a successful computer network device to function on a full-scale network. Additionally, the lab practices and information learned in this course will prepare students for CompTIA Network+ certification examinations.
CIT 187	Linux Networking Service and Support 2 Provides an exploration of the theory behind tools, techniques, procedures, and utilities necessary to design and implement a Linux/UNIX-based network. The course includes comprehensive details about potential areas of network and system configuration, cross-platform configuration, troubleshooting, performance monitoring, and debugging. In addition, the course will provide students with practices in writing shell scripts to perform more advanced techniques and performance monitoring while troubleshooting in a Linux/UNIX environment. Knowledge gained in this course will help students prepare and study for the CompTIA Linux+ certification examination.
CIT 188	Linux Networking Service and Support Lab 1 The lab provides and includes the hands-on exploration of tools, techniques, procedures and utilities necessary to design implement and support a Linux-based Local Area Network. The lab work includes but is not limited to comprehensive details of network and system configuration, troubleshooting, performance monitoring, and debugging. Students will write shell scripts for the purpose of performance monitoring and troubleshooting in a Linux environment. “Hands-on” experience gained in this course will help prepare students for the CompTIA Linux + certification examination.
CIT 189	Information System Security Design and Administration 2 Focuses and provides environment utilization of information technology, and the implementation of security practices. The focus of this course includes theory and hands-on experience necessary to pass the Certified Information Systems Security Professional (CISSP) certification examination. Students will learn to design and

implement a secure and reliable Local Area Network environment. The course will help students learn about the principles of information security on which managerial strategy can be formulated and how information security solutions need to be available to personnel in the field. This course provides materials and resources to help understand ethics, laws, policies, and recovery programs needed in information technology and, as well as drafting many relevant IT security policy statements. In addition, physical security aspects will be covered to understand external prevention. Students will prepare a Disaster Recovery plan for a sustainable & secure network environment; students will use this to begin building their own unique case definition. Knowledge and hands-on experience gained in this course will help prepare students for the CompTIA Security+ certification examinations, as well as introductory Cisco certification examinations.

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|----------------|---|
| CIT 190 | <p>Information System Security Design and Administration Lab 1</p> <p>The lab includes hands-on experience necessary to pass the CompTIA Security+ certification examination. Students will learn to design and implement secure standards, policies, and network implementations to a reliable computer network environment. Administration of both Windows and Linux systems will be referenced so that students can learn cross-platforms and understand the user and groups with permissions within a network. In addition, students will be drafting policies and documentation to enforce information security practices and procedures in the professional field of computer networks and sciences. Physical security enforcement and implementations will be considered in projects to enhance network environments. Disaster recovery and planning procedures will be designed and developed as a major part of the course to conclude how a business's/organizations function and operate after a disruptive scenario occurs. Students designing a Disaster Recovery Plan will begin portfolio building and project demonstration.</p> |
| CIT 281 | <p>LAN/WAN Design and Maintenance Principles 2</p> <p>This lab includes exploration of exercises essential to designing, securing, and constructing affected routed LAN and WAN networks. Students will also gain hands-on experiences in creating virtual networks and using trunk ports. Additionally, students will work with packet analysis and IP addressing in larger scale network utilizing skill-based assessment and presentation. The hands-on experience and materials will help prepare students for Cisco CCNA ICNDI examination.</p> |
| CIT 282 | <p>LAN/WAN Design and Maintenance Principles Lab 1</p> <p>The focus of this lab includes the exploration of lab exercises essential to designing, securing, and building an effective routed Local and Wide Area Networks. Students will also gain “hands-on” experience creating VLANs and trunk ports. “Hands-on” experience gained in this course will help prepare students for the Cisco CCNA ICND1 examination. (<i>Prerequisites:</i> CIT 185/CIT 186)</p> |
| CIT 283 | <p>Server and Network Operating System Principles 2</p> <p>Provides students the related theory of installation and configuration with Windows Servers operating systems. This course will provide skill necessary to configure, conduct support for client operating systems on computer networks. Additionally, an in-depth, hands-on training on network operating systems will prepare the students for expected industry situations. The course is not limited to both the theory of on-site and remote services in supporting network servers. The theory covered in this course includes interconnections of multiple servers. Students will learn to utilize Active</p> |

Directory, Event Viewer, and other network services to demonstrate operating systems and server management practices. Students successfully completing this course will gain knowledge to prepare them for Microsoft MCSA certifications.

- CIT 284 Server and Network Operating System Principles Lab 1**
This lab focuses on hands-on experience related to support, maintenance, and information retrieval of operating system performances pertaining to network management. This includes on-site and remote connection to a server based network in supporting network activity. The hands-on practices include installation, implementation of network devices, inspection of network mediums, local and remote management, file storage capabilities over a network, Active Directory, Event Viewer, system logs, group policies, and services pertaining to TCP/IP and Hyper-V. Students successfully completing this lab will gain hands-on practices and knowledge to prepare them for Microsoft MCSA certifications.
- CIT 285 Advanced Network Operating System Principles**
The focus of this course provides students with advanced theory and principles related to industry standard server Network Operating System platform and server virtualization. Theory of Installation, configuration and remote administration of both Host Network Operating Systems and Guest Network Operating System network services and Active Directory will be covered in detail. Theory relating to service and support of both Microsoft and Linux based server platforms, as well as Microsoft Internet Information Server will be explored.
- CIT 286 Advanced Network Operating System Principles Lab 1**
The focus of this lab includes “hands-on” experience related to Microsoft’s newest server platform and features. The scope of the “hands-on” experience in this lab includes but is not limited to Storage Space Direct, Nano Server, and Windows Containers, and Hyper-V virtualization. Installation, configuration and remote administration of both Host Network Operating Systems and Guest Network Operating Systems. Students successfully completing this lab will gain “hands-on” knowledge required to obtain the Microsoft MCSA, as well as the Cloud Platform and Infrastructure certification.
- CIT 289 Web Programming, Server Side Scripting 2**
Provides and introduces scripting technologies, and additional platforms to obtain and host web content. Technologies will also be used to develop websites into user-interactive applications. PHP will be utilized minimally, but allow students to work with programming arrays, logics, and event modeling to produce dynamic content via server resources. In addition, students will also learn how to create and manage web content by utilizing cascading style sheets, JavaScript, and extensible markup language (XML). The final project of the course is to design a fully functional website that will be hosted via a web server, and present a final web portfolio. (*Prerequisites:* CIT 283, CIT 284, DAT 201, PRG 101)
- CIT 290 Web Programming, Server Side Scripting Lab 2**
This lab focuses on the introduction of server-side scripting and web data access using a currently popular server side application platform and relational database. Additionally, the use of scripting languages will help student’s program organizational websites and applications, cover object orient programming in web environments, and

produce content via server resources. (*Prerequisites:* CIT 283, CIT 284, DAT 201, PRG 101)

- CIT 291 AWS Cloud Technologies 3**
The focus of this lab includes, but is not limited to an introduction to server-side scripting and web data access using a currently popular server side application platform and relational database. (*Prerequisites:* CIT 281, CIT 282, CIT 283, CIT 284)
- DAT 201 Database: Principles & Applications 3**
This course provides an introduction to databases for information systems, businesses, or CIS programs. Topics will include Access, QBE, SQL, normalization, design methodology, DBMS functions, database administration, and other database management approaches such as distributed databases, data warehouses, and XML. This course helps student to learn about data management, file organization, and data structures involved in the design, implementation, and use of a database management system. This course provides an introduction on SQL scripting. At the completion of this course, students should be able to understand a user's database requirements and translate requirements into a valid database design. (*Prerequisite:* PRG 101)
- DAT 203 Database Management Systems 3**
This course is a continuation of DAT201, with advanced topics of design, implementation, and use of database management systems. Involves skills in the design and development of information systems and their application and combines form and report components into a single integrated system. Students will learn to construct advanced query components and apply managerial tasks to report data finding for analytical use. The operation of functional dependence and configuration of hosted platforms to support a database project will be instructed in this course. (*Prerequisite:* DAT 201)
- PRG 101 Programming for the Enterprise 3**
This introductory programming course is required for Computer Information Technology students. Topics include introductory programming concepts, procedures, functions, and object-oriented programming design with implementation. This course involves problem solving-skills to assess cases and projects. The course focuses on Python language, Visual Basic, and Hypertext Markup Language (HTML) in a lab environment.
- PRG 103 C Sharp 3**
The introduction of JAVA is presented in this course so that students can design and develop dynamic object oriented programming projects. Some of the topics include inheritance, decision structures, arrays, and creation of classes using data objects. The languages used to implement object oriented contents are C# and C++. In addition this course helps to demonstrate strategies and prepare models which can be used as a project foundation so that the use of advanced tools can be further applied to construct application software contents.
- PRG 205 Programming with Scripting Languages 3**
The introduction of JAVA is presented in this course so that students can design and develop dynamic object oriented programming projects. Some of the topics include inheritance, decision structures, arrays, and creation of classes using data objects. The languages used to implement object oriented contents are C# and C++. In addition this

course helps to demonstrate strategies and prepare models which can be used as a project foundation so that the use of advanced tools can be further applied to construct application software contents.
(*Prerequisite: PRG 103*)

Electronic and Industrial Division -

Electronic Engineering Technology (AAS)

Program Objective

The Electronic Engineering Technology program prepares graduates as entry-level technicians. Students will become proficient in the theoretical and practical applications associated with electronic devices, instrumentation controls, and systems.

Career Opportunities

Graduates work as technicians and sales representatives in the field of electronic instrumentation and computer repair. Typical employers in the electronic career are machine, tool, and instrumentation manufacturers; electronic service companies; communication industries; electronic media; and electronic sales.

Program Learning Goals:

Goal 1: Graduates will be able to troubleshoot electronic circuits and systems using theoretical principles and measured values to resolve operational issues.

Student Learning Outcomes - Students will:

- Demonstrate competence with circuit identification
- Demonstrate competence in using various pieces of test equipment to gather information about a circuit or systems operation
- Employ corrective actions to make repair to systems under test

Goal 2: Graduates will demonstrate the ability to communicate with a customer, team member or supervisor in a professional manner to determine the nature of a problem or to explain repairs.

Student Learning Outcomes - Students will:

- Explain the defect found in circuits or systems and the solution to rectify the problem
- Produce written reports outlining work performed

Goal 3: Graduates will be able to use hand tools and test equipment in a safe manner.

Student Learning Outcomes - Students will:

- Demonstrate the safe use of a multimeter while making measurements in live circuits
- Demonstrate the safe use of oscilloscopes and other lab equipment to make measurements or apply signals.

Electronic Engineering Technology Major Courses

CIT 183	Network Architectures, Principles, and Protocols	2
CIT 184	Network Architectures, Principles, and Protocols Lab	1
EET 165	Digital Electronics	2
EET 166	Digital Electronics Lab	2
EET 167	Introduction to Semiconductors	2
EET 168	Introduction to Semiconductors Lab	1
EET 169	Integrated Circuits & Thyristors	2
EET 170	Integrated Circuits & Thyristors Lab	1
MEC 157	Sensors and Systems in Automation	2
MEC 158	Sensors and Systems in Automation Lab	1
EET 261	Communication Electronics	2
EET 262	Communication Electronics Lab	1
EET 265	Applied Electronics Principles & Applications	2
EET 266	Applied Electronics Principles & Applications Lab	2
or INT 299	Internship	4
MEC 243	Automation and Robotics I	2
MEC 244	Automation and Robotics I Lab	2
MEC 245	Programmable Logic Controllers I	2
MEC 246	Programmable Logic Controllers I Lab	2
MEC 253	Automation and Robotics II	2
MEC 254	Automation and Robotics II Lab	2
MEC 255	Programmable Logic Controllers II	2
MEC 256	Programmable Logic Controllers II Lab	2
MAT 201	College Algebra II and Trigonometry	3

Core Career Courses

EET 161	DC Electricity and Instrumentation	2
EET 162	DC Electricity and Instrumentation Lab	1
EET 163	Alternating Current and Passive Devices	2
EET 164	Alternating Current and Passive Devices Lab	1
ART 127	Computer Aided Design	3
BUS 101	Introduction to Business	3
COM 112	Public Speaking	3
MAT 101	College Algebra I and Trigonometry	3
HUM elective (ENG 105, PSY 105, COM 111, CSM 105)		3
SSS 101	First-year Experience	1

Minimum Credits to Graduate **61/64**

Electronic Engineering Technology

Associate in Applied Science (AAS)

Semester Program Outline

Semester 1		Credits
EET 161	DC Electricity and Instrumentation	2
EET 162	DC Electricity and Instrumentation Lab	1
EET 163	Alternating Current and Passive Devices	2
EET 164	Alternating Current and Passive Devices Lab	1
EET 165	Digital Electronics	2
EET 166	Digital Electronics Lab	2
ART 127	Computer Aided Design	3
MAT 101	College Algebra I and Trigonometry	3
SSS 101	First-year Experience	1
		14-17
Semester 2		
EET 167	Introduction to Semiconductors	2
EET 168	Introduction to Semiconductors Lab	1
EET 169	Integrated Circuits & Thyristors	2
EET 170	Integrated Circuits & Thyristors Lab	1
MEC 157	Sensors and Systems in Automation	2
MEC 158	Sensors and Systems in Automation Lab	1
HUM elective		3
MAT 201	College Algebra II and Trigonometry	3
		15
Semester 3		
EET 261	Communication Electronics	2
EET 262	Communication Electronics Lab	1
MEC 243	Automation and Robotics I	2
MEC 244	Automation and Robotics I Lab	2
MEC 245	Programmable Logic Controllers I	2
MEC 246	Programmable Logic Controllers I Lab	2
COM 112	Public Speaking	3
BUS 101	Introduction to Business	3
		17
Semester 4		
MEC 253	Automation and Robotics II	2
MEC 254	Automation and Robotics II Lab	2
MEC 255	Programmable Logic Controllers II	2
MEC 256	Programmable Logic Controllers II Lab	2
CIT 183	Network Architectures, Principles, and Protocols	2
CIT 184	Network Architectures, Principles, and Protocols Lab	1
EET 265	Applied Electronics Principles & Applications	2
EET 266	Applied Electronics Principles & Applications Lab	2
or INT 299	Internship	4
		15
Minimum Credits to Graduate		61/64

Electronic Engineering Technology Course Descriptions

Course No.	Course Title	Credits
CIT 183	Network Architectures, Principles, and Protocols Introduces software and hardware requirements needed to perform technical support, diagnostics, and application of solutions so that communication can be achieved across a constructed network. Students will learn about various network architectures, topologies considered in the field, the principles of network communication and data transferring over a network, and the necessary protocols to provide understanding on how a network functions based on operations. In addition, students will learn about media access techniques, network mediums, cable assessment, and conduct mechanics toward Internet Protocol (IP) addressing. The course will help prepare students with theoretical information from texts, presentations, and test builders for the CompTIA Network+ certification examination.	2
CIT 184	Network Architectures, Principles, and Protocols Lab The lab provides students with practices not limited to vendor-neutral hands-on tasks necessary to mock-up, design, and develop network implementations. This includes, design, installation, and technical support to modern network systems. Additionally, the lab prepares students to construct network medium, and conduct testing for signal assurance. The course will also demonstrate safety procedures, and environmental skills to support problem solving, communication, and professionalism in handling real-world experience problems experienced in computer network settings. The lab will help prepare students with hands-on practices and resources providing information from referential sources significantly correlating to the CompTIA Network+ certification examination.	1
EET 161	DC Electricity and Instrumentation This course introduces the student to the theory and operation of basic DC circuits, circuit construction, operation and troubleshooting. Basic alternative energy technologies are introduced. The student will also receive instruction on soldering, digital multi-meter usage, and Ohm's Law applications for testing and troubleshooting electric circuits. Elements of proper disposal of batteries and other circuit components considered to be hazardous waste are included. (<i>Co-requisite:</i> EET 162)	2
EET 162	DC Electricity and Instrumentation Lab This course applies the theory taught in EET 161 through hands on building and testing of basic electric circuits. The student will also gain practical experience in soldering, digital multi-meter usage, and Ohm's Law applications for testing and troubleshooting the electric circuits they build. Elements of proper disposal of batteries and other circuit components considered hazardous waste are emphasized throughout this course. (<i>Co-requisite:</i> EET 161)	1
EET 163	Alternating Current and Passive Devices This course introduces the student to circuitry basic to AC electrical theory. It identifies the fundamental differences between AC and DC energy sources and circuit components. It also introduces oscilloscope usage, AC units, nomenclature and electromagnetism. The course will also cover inductors, transformers, and capacitors	2

and their effects in AC circuits. Work place energy efficiency and conservation habits are included. The concepts of RCL circuits and their use as passive filters will be covered. (*Co-requisite*: EET 164)

- EET 164 Alternating Current and Passive Devices Lab 1**
This course applies the theory taught in EET 163 through hands on building and testing of basic AC circuits. The student will use oscilloscopes and digital meters to measure amplitude, frequency and phase of an AC signal. As the student progresses through the course, test equipment will be used to test transformers, inductive circuits, capacitive circuits, and passive filters. The student will also be introduced to troubleshooting techniques and have time to practice those techniques on circuits they build.
(*Co-requisite*: EET 163)
- EET 165 Digital Electronics 2**
This course begins by familiarizing the student with the fundamental gates, numbering systems and simplification techniques used for the implementation of digital circuitry. It continues by introducing the student to the different digital codes, seven segment displays and flip-flops with emphasis placed on schematic interpretation, nomenclature and troubleshooting. This course continues with the investigation of the circuits used for counters, registers, arithmetic logic circuits and digital to analog interfacing. It examines the circuitry of each section with emphasis on circuit timing, characteristic waveforms and troubleshooting. (*Co-requisite*: EET 166)
- EET 166 Digital Electronics Lab 2**
This course is designed to provide the student with hands on testing and troubleshooting of the digital circuits discussed in EET 169. The circuits investigated will begin with basic logic gates and continue through flip-flops, counters, and shift registers. The student will be expected to use test equipment, such as the oscilloscope, digital meter and logic probe, to test and troubleshoot the circuits built throughout this course. (*Co-requisite*: EET 165)
- EET 167 Introduction to Semiconductors 2**
This course provides an introduction to semiconductor theory, the different types of semiconductor components, their symbols, characteristics, and uses. Basic power supplies, small signal amplifiers, large signal amplifiers and coupling techniques are covered. This course will concentrate on characteristic waveforms, theory and troubleshooting. Practice is provided regarding diodes, transistors and circuit applications. Sustainable practices to minimize resources and chemical use are an integral part of the course. (*Prerequisites*: EET 161, EET 162, EET 163, EET 164; *Co-requisite*: EET 168)
- EET 168 Introduction to Semiconductors Lab 1**
This course provides the student with the opportunity to apply the theoretical concepts from EET 165 to real world circuits. The student will use various pieces of test equipment to verify circuit operation and to troubleshoot circuits that are faulty. At all times safety will be emphasized throughout this course. Some of the circuits included in this course are rectifiers, voltage multipliers, amplifiers from the bipolar junction transistor and the field effect transistor families. The student will use digital meters and oscilloscopes to evaluate the operational performance of the circuits used

in this course. (*Prerequisites:* EET 161, EET 162, EET 163, EET 164; *Co-requisite:* EET 167)

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| EET 169 | Integrated Circuits and Thyristors | 2 |
| | This course provides an introduction to integrated circuits through the operational amplifier, its characteristics and configurations. Amplifier troubleshooting is included, highlighting methods of determining causes of failures and locating problems. This study of integrated circuits will continue by investigating the operation of integrated voltage regulators and the 555 universal timer. The thyristors family of electronic components is introduced through lecture to identify the characteristics, circuitry, and methods of troubleshooting this family of components. (<i>Prerequisites:</i> EET 161, EET 162, EET 163, EET 164; <i>Co-requisite:</i> EET 170) | |
| EET 170 | Integrated Circuits and Thyristors Lab | 1 |
| | This course will provide the student the opportunity to work with operational amplifiers integrated voltage regulators and 555 universal timers. These devices and others will be used to build and troubleshoot amplifiers, active filters and power supply circuits. The thyristors family of electronic components is also investigated through experimentation, testing and troubleshooting. (<i>Prerequisites:</i> EET 161, EET 162, EET 163, EET 164; <i>Co-requisite:</i> EET 169) | |
| EET 261 | Communication Electronics | 2 |
| | This course begins by familiarizing the student with the fundamental theory, safety, circuits and test equipment used in communications. The course continues to cover modulation techniques, transmitters, receivers, transmission lines and antennas. The topics of safety and testing of communication circuits are an integral part of this course. (<i>Prerequisites:</i> EET 163, EET 164 EET 165, EET 166, EET 169, EET 170; <i>Co-requisite:</i> EET 262) | |
| EET 262 | Communication Electronics Lab | 1 |
| | This course has the student work with test equipment used to design and evaluate circuits common to the communications industry. Students in this course will work with oscilloscopes, spectrum analyzers, digital meters, RF meters, ELVIS and LabVIEW testing environments. Construction, safety and testing of communication circuits are an integral part of this course. (<i>Prerequisites:</i> EET 163, EET 165, EET 166, EET 169, EET 170; <i>Co-requisite:</i> EET 261) | |
| EET 265 | Applied Electronics Principles & Applications | 2 |
| | This course is intended to provide practical electronic projects and procedures to principles and theories learned over the previous courses. Students will be expected to hone their practical skills to better prepare them for an entry-level position upon graduation. Associate theory will be discussed to enhance the student's practical abilities. (<i>Prerequisites:</i> EET 263, EET 264, AMT 253, AMT 254 & ART 105; <i>Co-requisite:</i> EET 266) | |
| EET 266 | Applied Electronics Principles & Applications Lab | 2 |
| | In this course students will evaluate pieces of test equipment to hone their skills in measurement and troubleshooting in various scenarios. The students will be expected to work with oscilloscopes, digital meters, spectrum analyzers, soldering equipment, other pieces of test equipment, and time management in practical settings. | |

(Prerequisites: EET 263, EET 264, AMT 253, AMT 254 & ART 105; Co-requisite: EET 265)

- MEC 157 Sensors and Systems in Automation 2**
This course will introduce the students to common types of detection sensors used in automation. The theory of operation, setup in control circuits and troubleshooting will also be covered. The course will also introduce the student to pneumatic and hydraulic systems used in the industrial setting for control of actuators and grippers in an automated system. (Prerequisites: EET 161, EET 162, MEC 155, MEC 156; Co-requisite: MEC 157)
- MEC 158 Sensors and Systems in Automation Lab 1**
This course will introduce the students to common types of detection devices used in automation through hands on experimentation. The student will set-up, operate and troubleshoot practical problems in a laboratory setting. The course will also introduce the student to pneumatic and hydraulic systems used in the industrial setting for control of actuators and grippers in an automated system. The student will work with hydraulic and pneumatic systems to deal with the concepts of setup and integration of these systems into the larger control scheme of an automated system (Prerequisites: EET 161, EET 162, MEC 155, MEC 156; Co-requisite: MEC 157)
- MEC 243 Automation and Robotics I 2**
This course begins with a study of the terminology for automated and robotic systems. Then the students will work with the classifications, coordinate systems, and physical makeup of a robotic system. This course continues with an examination of the power systems, lifting capacities and applications for automation and robots. An investigation of sensors, vision, artificial intelligence, the principles and techniques involved in working with robotics. (Co-requisite: MEC 244, MEC 245, MEC 246)
- MEC 244 Automation and Robotics I Lab 2**
This course is designed to work in parallel with AMT 259. The student will work with a FANUC industrial robot and design programs to guide the robot through movement paths. An emphasis is placed on safety at all time. Projects will range from linear and circular motion to palletizing applications. (Co-requisite: MEC 243, MEC 245, MEC 246)
- MEC 245 Programmable Logic Controllers I 2**
This course is designed to introduce the student to modern programmable logic controllers base on Control Logix and Compact Logix Programmable Automation Controllers (PAC's). The student will investigate the specification, setup, configuration, programming, and implementation of the controller. The course then continues with an examination of the different types of hardware devices that are used in conjunction with PAC's. An emphasis is placed on programming projects throughout the course. (Co-requisite: MEC 246, MEC 243, MEC 244)
- MEC 246 Programmable Logic Controllers I Lab 2**
The student will investigate the setup, configuration, programming, and implementation of the controllers through lab exercises designed to have the student build a system from beginning to end. As the student progresses through this course the experiments will progressively build toward real world applications. (Co-requisite: MEC 245, MEC 243,

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| MEC 253 | <p>Automation & Robotics 2 2</p> <p>This course continues the study of robotics and automated systems started in the first robotics course. The integration of the robot with other automated systems is investigated. Techniques for handshaking, task passing, and sequencing events will be studied. The student will design integration projects based on the criteria provided in the lecture. Safety concerns when dealing with integration projects will be emphasized throughout the course. (<i>Prerequisites:</i> MEC 243, MEC 244; <i>Co-requisites:</i> MEC 254, MEC 255, MEC 256)</p> |
| MEC 254 | <p>Automation & Robotics 2 Lab 2</p> <p>This course continues the study of robotics and automated systems started in the first robotics course through hands-on projects. The integration of the robot with other automated systems will be investigated. Techniques for handshaking, task passing, and sequencing events will be studied. The student will implement integration projects based on the criteria provided in the lab. Safety concerns when dealing with integration projects will be emphasized throughout the course. (<i>Prerequisites:</i> MEC 243, MEC 244; <i>Co-requisite:</i> MEC 253, MEC 255, MEC 256)</p> |
| MEC 255 | <p>Programmable Logic Controllers II 2</p> <p>This course continues the investigation into the modern programmable logic controllers(PLCs) using the CompactLogix Programmable Automation Controllers (PACs) and Human Machine Interfaces (HMIs). The student will use the PACs to work through exercises designed to implement control systems from beginning to end. This process will also have the student work through the setup, configuration, programming, and implementation of HMIs to provide an operator with a usable and well thought out touch screen to interact with a process under PAC control. (<i>Prerequisites:</i> MEC 245, MEC 246; <i>Co-requisite:</i> MEC 256, MEC 253, MEC 254)</p> |
| MEC 256 | <p>Programmable Logic Controllers II Lab 2</p> <p>This course is designed to continue the investigation into the modern programmable logic controllers(PLCs) through hands-on experiments using the CompactLogix Programmable Automation Controllers (PACs) and Human Machine Interfaces (HMIs). The student will use the PACs to work through exercises designed to implement control systems from beginning to end. This process will also have the student work through the setup, configuration, programming, and implementation of HMIs to provide an operator with a usable and well thought out touch screen to interact with a process under PAC control. An emphasis is placed on programming projects throughout the course. (<i>Prerequisites:</i> MEC 245, MEC 246; <i>Co-requisites:</i> MEC 255, MEC 253, MEC 254)</p> |

Electronic and Industrial Division -

Mechatronics Technology (AAS)

Program Objective

The Mechatronics Technology program prepares graduates as entry-level technicians. Students will become proficient in the theoretical and practical applications associated with electronic devices, fabrication technologies, electro-mechanical systems, and industry 4.0.

Career Opportunities

Electro-mechanical technicians have the ability to work in many industrial environments, including energy, plastics, computer and communications equipment manufacturing, and aerospace. They often work both at production sites and in offices.

Program Learning Goals:

Goal 1: Graduates will possess the skills needed to obtain an entry-level technician position in the mechatronics field.

Student Learning Outcomes - Students will:

- Demonstrate knowledge of the work environment, behavior, and dress
- Demonstrate the ability to safely setup and operate electronic equipment
- Demonstrate safe setup and operation of various electro-mechanical, digital fabrication, and kinematic systems

Goal 2: Graduates will be able to troubleshoot electrical, electronic, and mechanical systems using theoretical principles and measured values to resolve operational issues.

Student Learning Outcomes - Students will:

- Demonstrate competence with circuit identification and print reading
- Demonstrate competence in using various pieces of test equipment to gather information about a circuit or systems operation
- Employ corrective actions to effect repairs to systems

Goal 3: Graduates will demonstrate the ability to communicate with a customer, team member, or supervisor in a professional manner to determine the nature of a problem or to explain repairs.

Student Learning Outcomes - Students will:

- Explain the defect found in circuits or systems and the solution to rectify the problem
- Produce written reports outlining work performed

Goal 4: Graduates will demonstrate the proper and safe use of hand tools, measuring equipment, and test equipment used during fabrication or troubleshooting.

Student Learning Outcomes - Students will:

- Demonstrate correct and accurate use of measuring instrument
- Demonstrate correct use of hand tools, power tools, and safety equipment (PPE)

Mechatronics Technology

Major Courses

EET 161	DC Electricity and Instrumentation	2
EET 162	DC Electricity and Instrumentation Lab	1
EET 163	Alternating Current and Passive Devices	2
EET 164	Alternating Current and Passive Devices Lab	1
MEC 101	Principals of Mechatronics	2
MEC 151	Hand Fabrication	1
MEC 152	Hand Fabrication Lab	2
MEC 155	Additive Manufacturing	1
MEC 156	Additive Manufacturing	2
MEC 157	Sensors and Systems in Automation	2
MEC 158	Sensors and Systems in Automation Lab	1
MEC 161	Microcontrollers & Applications	1
MEC 162	Microcontrollers & Applications Lab	2
MEC 243	Automation and Robotics I	2
MEC 244	Automation and Robotics I Lab	2
MEC 245	Programmable Logic Controllers I	2
MEC 246	Programmable Logic Controllers I Lab	2
MEC 251	Industry 4.0	1
MEC 252	Industry 4.0 Lab	3
MEC 253	Automation and Robotics II	2
MEC 254	Automation and Robotics II Lab	2
MEC 255	Programmable Logic Controllers II	2
MEC 256	Programmable Logic Controllers II Lab	2
MEC 257	Production & Assembly	1
MEC 258	Production & Assembly Lab	3
MEC 259	Capstone Project	1
MEC 260	Capstone Project Lab	3
or INT 299	Internship	4

Core Career Courses

ART 127	Computer-Aided Design	3
MAT 110	Trigonometry	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
CPT 101	Microcomputer I	3
PHY 101	Introductory Physics	3
COM 112	Public Speaking	3
CSM 105	Customer Service of World	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate **71**

Mechatronics Technology
Associate in Applied Science (AAS)
Semester Program Outline

Semester 1		Credits
EET 161	DC Electricity and Instrumentation	2
EET 162	DC Electricity and Instrumentation Lab	1
EET 163	Alternating Current and Passive Devices	2
EET 164	Alternating Current and Passive Devices Lab	1
MEC 101	Principles of Mechatronics Technology	2
MEC 151	Hand Fabrication	1
MEC 152	Hand Fabrication Lab	2
ART 127	Computer-Aided Design	3
MAT 110	Trigonometry	3
SSS 101	First-Year Experience	1
		18
Semester 2		
MEC 157	Sensors and Systems in Automation	2
MEC 158	Sensors and Systems in Automation Lab	1
MEC 155	Additive Manufacturing	1
MEC 156	Additive Manufacturing Lab	2
MEC 161	Microcontrollers & Applications	1
MEC 162	Microcontrollers & Applications Lab	2
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
PHY 101	Introductory Physics	3
		18
Semester 3		
MEC 243	Automation and Robotics I	2
MEC 244	Automation and Robotics I Lab	2
MEC 245	Programmable Logic Controllers I	2
MEC 246	Programmable Logic Controllers I Lab	2
MEC 251	Industry 4.0	1
MEC 252	Industry 4.0 Lab	3
COM 112	Public Speaking	3
CSM 105	Customer Service and Our World	3
		18
Semester 4		
MEC 253	Automation & Robotics II	2
MEC 254	Automation & Robotics II Lab	2
MEC 255	Programmable Logic Controllers II	2
MEC 256	Programmable Logic Controllers II Lab	2
MEC 257	Production & Assembly	2
MEC 258	Production & Assembly Lab	3
MEC 259	Capstone Project	1
MEC 260	Capstone Project Lab	3
or INT 299	Internship	4
		17
Minimum Credits to Graduate		71

Mechatronics Technology (AAS)

Course Descriptions

EET 162	DC Electricity and Instrumentation Lab This course applies the theory taught in EET 161 through hands on building and testing of basic electric circuits. The student will also gain practical experience in soldering, digital multi-meter usage, and Ohm's Law applications for testing and troubleshooting the electric circuits they build. Elements of proper disposal of batteries and other circuit components considered hazardous waste are emphasized throughout this course. (<i>Co-requisite:</i> EET 161)	1
EET 163	Alternating Current and Passive Devices This course introduces the student to circuitry basic to AC electrical theory. It identifies the fundamental differences between AC and DC energy sources and circuit components. It also introduces oscilloscope usage, AC units, nomenclature and electromagnetism. The course will also cover inductors, transformers, and capacitors and their effects in AC circuits. Work place energy efficiency and conservation habits are included. The concepts of RCL circuits and their use as passive filters will be covered. (<i>Co-requisite:</i> EET 164)	2
EET 164	Alternating Current and Passive Devices Lab This course applies the theory taught in EET 163 through hands on building and testing of basic AC circuits. The student will use oscilloscopes and digital meters to measure amplitude, frequency and phase of an AC signal. As the student progresses through the course, test equipment will be used to test transformers, inductive circuits, capacitive circuits, and passive filters. The student will also be introduced to troubleshooting techniques and have time to practice those techniques on circuits they build. (<i>Co-requisite:</i> EET 163)	1
MEC 101	Principles of Mechatronics Technology This course introduces students to mechatronics and the many areas into which it is incorporated. The focus of the course will be on fabrication processes, materials, robotics, sustainable design and manufacturing, and related mechatronics principles. The course is designed to give the students an understanding of mechatronics' many applications, and the many ways all of the different aspects work in synergy.	2
MEC 151	Hand Fabrication This course covers standard hand and power tool fabrication technologies, safety practices, working concepts of hand tools, bandsaws, belt sanders, pedestal grinders, drill presses, and cutting tools. This course will also cover safety data sheets and material specifications.	1
MEC 152	Hand Fabrication Lab This course covers the use of fabrication technologies, safety practices, working concepts of hand tools, bandsaws, belt sanders, pedestal grinders, drill presses, and cutting tools. It will serve to reinforce how various materials and fabrication techniques work together.	2
MEC 155	Additive Manufacturing	1

This course introduces the students in the design of 3D watertight meshes to create physical parts utilizing a 3D printer. Topics covered include the history of additive manufacturing, types of printing technologies, design for additive manufacturing, materials used, and corporate application of this process.

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| MEC 156 | Additive Manufacturing Lab | 2 |
| | This course instructs the students in the use of various software packages to design and create the code required use a 3D printer. Software packages taught include; Catalyst, Cura, Tinker CAD, Solidworks, Fusion360, and Meshmixer. After creation of parts using the CAD software students then setup the part to be printed. When finished printing, students are then instructed in cleaning the part of support material and checking for accuracy and functionality. (<i>Co-requisite</i> : AMT 255) | |
| MEC 157 | Sensors and Systems in Automation | 2 |
| | This course will introduce the students to common types of detection sensors used in automation. The theory of operation, setup in control circuits and troubleshooting will also be covered. The course will also introduce the student to pneumatic and hydraulic systems used in the industrial setting for control of actuators and grippers in an automated system. (<i>Prerequisites</i> : EET 161, EET 162, MEC 155, MEC 156; <i>Co-requisite</i> : MEC 157) | |
| MEC 158 | Sensors and Systems in Automation Lab | 1 |
| | This course will introduce the students to common types of detection devices used in automation through hands on experimentation. The student will set-up, operate and troubleshoot practical problems in a laboratory setting. The course will also introduce the student to pneumatic and hydraulic systems used in the industrial setting for control of actuators and grippers in an automated system. The student will work with hydraulic and pneumatic systems to deal with the concepts of setup and integration of these systems into the larger control scheme of an automated system (<i>Prerequisites</i> : EET 161, EET 162, MEC 155, MEC 156; <i>Co-requisite</i> : MEC 157) | |
| MEC 161 | Microcontrollers & Applications | 1 |
| | This course introduces students to microcontrollers and the ways they are used in various environments. The course will focus on the who, what, when, where, and why of employing microcontrollers and various case studies of implementation. | |
| MEC 162 | Microcontrollers & Applications Lab | 2 |
| | This course will cover various scenarios and implementation of microcontrollers. The students will be instructed in various components that include but are not limited to: LEDs, Photoresistors, DIP switches, potentiometers, Servos, DC Motors, and Stepper Motors. The students will be programming their builds and utilizing real-world scenarios that will be introduced to generate solutions. | |
| MEC 243 | Automation and Robotics I | 2 |
| | This course begins with a study of the terminology for automated and robotic systems. Then the students will work with the classifications, coordinate systems, and physical makeup of a robotic system. This course continues with an examination of the power systems, lifting capacities and applications for automation and robots. An investigation of sensors, vision, artificial intelligence, the principles and techniques involved in working with robotics. (<i>Co-requisite</i> : MEC 244, MEC 245, MEC 246) | |

MEC 244	Automation and Robotics I Lab	2
	This course is designed to work in parallel with AMT 259. The student will work with a FANUC industrial robot and design programs to guide the robot through movement paths. An emphasis is placed on safety at all time. Projects will range from linear and circular motion to palletizing applications. (<i>Co-requisite</i> : MEC 243, MEC 245, MEC 246)	
MEC 245	Programmable Logic Controllers I	2
	This course is designed to introduce the student to modern programmable logic controllers base on Control Logix and Compact Logix Programmable Automation Controllers (PAC's). The student will investigate the specification, setup, configuration, programming, and implementation of the controller. The course then continues with an examination of the different types of hardware devices that are used in conjunction with PAC's. An emphasis is placed on programming projects throughout the course. (<i>Co-requisite</i> : MEC 246, MEC 243, MEC 244)	
MEC 246	Programmable Logic Controllers I Lab	2
	The student will investigate the setup, configuration, programming, and implementation of the controllers through lab exercises designed to have the student build a system from beginning to end. As the student progresses through this course the experiments will progressively build toward real world applications. (<i>Co-requisite</i> : MEC 245, MEC 243, MEC 244)	
MEC 251	Industry 4.0	1
	This course will cover the usage cases and implementation of Internet of Things (IoT) devices and digital fabrication technologies. The students will research applications/case studies, sensors, and data logging. They will also look at methods of evaluating, organizing, and storing the data collected. The intersection of IoT and digital fabrication will be discussed.	
MEC 252	Industry 4.0 Lab	3
	This course will instruct students in the implementation, fabrication, and programming of Internet of Things (IoT) devices augmented and enables with digital fabrication techniques. The students will use real-world applications/case studies to inform their design and use of sensors to generate information and data logs for evaluation. They will implement methods of evaluating, organizing, and storing the data collected.	
MEC 253	Automation & Robotics 2	2
	This course continues the study of robotics and automated systems started in the first robotics course. The integration of the robot with other automated systems is investigated. Techniques for handshaking, task passing, and sequencing events will be studied. The student will design integration projects based on the criteria provided in the lecture. Safety concerns when dealing with integration projects will be emphasized throughout the course. (<i>Prerequisites</i> : MEC 243, MEC 244; <i>Co-requisites</i> : MEC 254, MEC 255, MEC 256)	
MEC 254	Automation & Robotics 2 Lab	2
	This course continues the study of robotics and automated systems started in the first robotics course through hands-on projects. The integration of the robot with other automated systems will be investigated. Techniques for handshaking, task passing,	

and sequencing events will be studied. The student will implement integration projects based on the criteria provided in the lab. Safety concerns when dealing with integration projects will be emphasized throughout the course. (*Prerequisites:* MEC 243, MEC 244; *Co-requisite:* MEC 253, MEC 255, MEC 256)

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| MEC 255 | <p>Programmable Logic Controllers II 2</p> <p>This course continues the investigation into the modern programmable logic controllers(PLCs) using the CompactLogix Programmable Automation Controllers (PACs) and Human Machine Interfaces (HMIs). The student will use the PACs to work through exercises designed to implement control systems from beginning to end. This process will also have the student work through the setup, configuration, programming, and implementation of HMIs to provide an operator with a usable and well thought out touch screen to interact with a process under PAC control. (<i>Prerequisites:</i> MEC 245, MEC 246; <i>Co-requisite:</i> MEC 256, MEC 253, MEC 254)</p> |
| MEC 256 | <p>Programmable Logic Controllers II Lab 2</p> <p>This course is designed to continue the investigation into the modern programmable logic controllers(PLCs) through hands-on experiments using the CompactLogix Programmable Automation Controllers (PACs) and Human Machine Interfaces (HMIs). The student will use the PACs to work through exercises designed to implement control systems from beginning to end. This process will also have the student work through the setup, configuration, programming, and implementation of HMIs to provide an operator with a usable and well thought out touch screen to interact with a process under PAC control. An emphasis is placed on programming projects throughout the course. (<i>Prerequisites:</i> MEC 245, MEC 246; <i>Co-requisites:</i> MEC 255, MEC 253, MEC 254)</p> |
| MEC 257 | <p>Production & Assembly 2</p> <p>This course introduces students to the full production of an end-user grade product from raw materials. The course will focus on the steps needed to produce a product that needs fabrication (parts and electronics), and assembly. The students will do research, cost evaluations, and analysis of both the final product and its lifecycle.</p> |
| MEC 258 | <p>Production & Assembly Lab 3</p> <p>In this course, students will produce a small production run of an end-user grade product. The course will focus on the design, fabrication, production, and assembly of a full manufacturing run of a single product. The students will decide on a product, iterate designs, test, evaluate, and fabricate the final product.</p> |
| MEC 259 - | <p>Capstone Project 1</p> <p>In this course, the students will work on research for an open-ended research project to advance the lab space. Projects will be cycled based on the group's interests. Elements from each of their previous courses will be used and needed to complete this course successfully. The objective of this course is to research the implementation of upgrades to the lab.</p> |
| MEC 260 | <p>Capstone Project Lab 3</p> <p>In this course, the students will work to implement research on an open-ended research project to advance the lab space. Projects will be cycled based on the group's interests. Elements from each of their previous courses will be used and needed to complete this</p> |

course successfully. The objective of this course is to implement research of upgrades to the lab.

EET 161

DC Electricity and Instrumentation

2

This course introduces the student to the theory and operation of basic DC circuits, circuit construction, operation and troubleshooting. Basic alternative energy technologies are introduced. The student will also receive instruction on soldering, digital multi-meter usage, and Ohm's Law applications for testing and troubleshooting electric circuits. Elements of proper disposal of batteries and other circuit components considered to be hazardous waste are included. (*Co-requisite: EET 162*)

Electronic and Industrial Division -

Welding Fabrication and Manufacturing Technology (AAS)

Program Objective

The Associate of Applied Science in Welding Fabrication and Manufacturing Technology builds on the certificate program in which students learn about safety, hand tools, oxyacetylene torches, plasma arc, shielded metal arc welding (stick), gas metal arc welding (MIG), gas tungsten arc welding (TIG), flux cored arc welding, metallurgy, print reading, and weld symbols. The second year of the program focuses on fabrication and pipe welding, two high-demand areas in the welding industry.

Work Environment

Graduates work as welders, welder/fabricators, maintenance welders, fitters, ornamental metal sculptors, and welder helpers. Typical employers include the Boilermaker's union, departments of transportation, structural steel fabricators, custom metal shops, industrial contractors, shipyards, pipe and pressure vessel fabricators, and retail welding sales.

Career Opportunities

- Welder
- Pipefitter
- Ironworker
- Maintenance Technician

Program Learning Goals

Goal 1: The Welding program will prepare the student for entry level employment in welding.

Student Learning Outcomes - Students will:

- Demonstrate safe welding practices.
- Perform basic welding skills in SMAW (stick), GMAW (mig), GTAW (tig), and oxyfuel cutting procedures.
- Perform basic maintenance on welding machines.
- Interpret basic welding symbols.

Goal 2: Graduates will possess the skills necessary to obtain entry-level fabrication positions.

Student Learning Outcomes - Students will:

- Demonstrate safe fabricating practices.
- Perform basic welding techniques in uphill pipe welding.
- Perform basic metal cutting techniques.
- Perform the skills needed in fabrication and manufacturing environments.

Goal 3: Graduates will understand the importance of professional behavior within the welding industry.

Student Learning Outcomes - Graduates will:

- Communicate with internal and external stakeholder in a professional and appropriate manner.
- Demonstrate professional skills as they relate to timeliness, accountability, and reliability

Welding Fabrication and Manufacturing Technology (AAS)

Major Courses

WTC 151	Shielded Metal Arc Welding I	2
WTC 152	Shielded Metal Arc Welding I Lab	4
WTC 153	Gas Metal and Flux Cored Arc Welding I	1
WTC 154	Gas Metal and Flux Cored Arc Welding I Lab	2
WTC 155	Gas Metal and Flux Cored Arc Welding II	1
WTC 156	Gas Metal and Flux Cored Arc Welding II Lab	2
WTC 157	Gas Tungsten Arc Welding	2
WTC 158	Gas Tungsten Arc Welding Lab	4
WFT 251	Introduction to Weld testing	1
WFT 253	Pipe Welding I Uphill	1
WFT 254	Pipe Welding I Uphill Lab	4
WFT 257	Introduction to Fabrication	1
WFT 258	Introduction to Fabrication Lab	3
WFT 234	Pipe Welding	4
AMT 151	Fundamentals of Metal Cutting	2
AMT 152	Fundamentals of Metal Cutting Lab	1
AMT 153	Subtractive Manufacturing	1
AMT 154	Subtractive Manufacturing Lab	2
MAT 101	College Algebra and Trigonometry	3

Core Career Courses

ART 101	Blueprint Reading	2
SOC###	Social Science General Education Elective	3
HUM ###	Humanities General Education Elective	3
SCI ###	Science General Education Elective	3
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 100	Applied Mathematics for Welders	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate **62**

Welding Fabrication and Manufacturing Technology (AAS)

Semester Program Outline

Semester 1		Credits
ART 101	Blueprint Reading	2
MAT 100	Applied Mathematics for Welders	3
SSS 101	First-Year Experience	1
WTC 151	Shielded Metal Arc Welding I	2
WTC 152	Shielded Metal Arc Welding I Lab	4
WTC 153	Gas Metal and Flux Cored Arc Welding I	1
WTC 154	Gas Metal and Flux Cored Arc Welding I Lab	2
		15
Semester 2		
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
WTC 155	Gas Metal and Flux Cored Arc Welding II	1
WTC 156	Gas Metal and Flux Cored Arc Welding II Lab	2
WTC 157	Gas Tungsten Arc Welding	2
WTC 158	Gas Tungsten Arc Welding Lab	4
		15
Semester 3		
HUM ###	Humanities General Education Elective	3
SCI ###	Science General Education Elective	3
WFT 251	Introduction to Weld testing	1
WFT 253	Pipe Welding I Uphill	1
WFT254	Pipe Welding I Uphill Lab	4
AMT 151	Fundamentals of Metal Cutting	1
AMT 152	Fundamentals of Metal Cutting Lab	2
		15
Semester 4		
SOC###	Social Science General Education Elective	3
MAT 101	College Algebra and Trigonometry	3
WFT 257	Introduction to Fabrication	1
WFT 258	Introduction to Fabrication Lab	3
WFT 234	Pipe Welding	4
AMT 153	Subtractive Manufacturing	1
AMT 154	Subtractive Manufacturing Lab	2
		17
Minimum Credits to Graduate		62

Welding Fabrication and Manufacturing Technology

Course Descriptions

Course No.	Course Title	Credits
AMT 151	Fundamentals of Metal Cutting This course covers machine trades theory including safety practices and working concepts of hand tools, bandsaws, belt sanders, pedestal grinders, drill presses, and cutting tools. It explains various material modification applications including hand tools, cutting, deburring, sharpening, grinding, and various cutting tools. Measuring instruments are also stressed throughout this course.	2
AMT 152	Fundamentals of Metal Cutting Lab This course covers machine trades theory including safety practices and working concepts of hand tools, bandsaws, belt sanders, pedestal grinders, drill presses, and cutting tools. It provides practical applications from the lecture via projects. (Co-requisite: AMT 151)	1
AMT 153	Subtractive Manufacturing Safety, cutting speeds, types of lathes, lathe accessories, lathe operation, and measuring instruments are covered in this course. Information about safety, types of milling machines, milling machine attachments, milling operations are covered in this course. Technical competence in the use of measuring instruments is also stressed. (Prerequisite: AMT 151)	1
AMT 154	Subtractive Manufacturing Lab This covers the practical portion of the subtractive manufacturing course. Lathe operations covered include facing, turning, center drilling, reaming, boring, tapering, knurling, and thread chasing. Milling operations include squaring a piece, locating holes, drilling operations, and milling slots. (Co-requisite: AMT 153)	2
ART 101	Blueprint Reading for Welders This course provides detailed information to help the students gain the skills that are required to read prints that are most common in the welding industry. Basic lines and view, dimensions, bill of materials and structural shapes are emphasized in this course. Accuracy of measurements and attention to detail will be stressed in the course.	2
WFT 251	Introduction to Weld Testing This course covers the various Non-Destructive and destructive methods used to test welds. Students will experience different methods to examine welds and if they are acceptable to different AWS Codes.	1
WFT 253	Pipe Welding I Uphill This course covers Key terms, Shop math, specific welding symbols, joint design, weld repairs, and weld discontinuities and defects associated with various pipe welding procedures.	1
WFT 254	Pipe Welding I Uphill Lab This covers the practices and procedures used to weld pipe and piping systems with the SMAW process. Cutting and fitting of pipe with specific tools will be covered.	4

WFT 257	Introduction to Fabrication	1
	This course covers specific phases of fabrication. Various weld codes will be reviewed. Learning to draw basic shop drawings will be demonstrated and proper rigging terms and practices will be discussed.	
WFT 258	Introduction to Fabrication Lab	3
	This course covers the practices of implementing blueprints to metal fabrication. Students will fabricate various projects from simple to complex drawings. Welding processes form SMAW, GMAW, FCAW and GTAW will be used. Students will learn different techniques for squaring, tacking and welding parts used in the projects.	
WFT 234	Pipe Welding	4
	This course covers the practices and procedure used to weld pipe and piping systems. The GTAW, GMAW, and the SMAW process procedures are covered as well as the tools, materials, and equipment unique to piping systems.	
WTC 151	Shielded Metal Arc Welding	2
	This course is designed to teach the student the basic safety, principles, practices, and applications of SMAW. This course covers welding trade theory including safety, tool usage, equipment set up and standard terms and definitions. Basic welding and cutting techniques in the flat, horizontal, vertical and overhead position, tank safety and welding safety will be taught. The course also covers basic metallurgy and how to identify weld problems and defects. This course will progress to the most advanced SMAW practices with concentration on vertical and overhead welding techniques conforming to the AWS structural welding code. Weld problems, corrections and specific techniques will be covered in this course.	
WTC 152	Shielded Metal Arc Welding Lab	4
	This course is designed to allow students to apply the theory and techniques taught in WTC151 Shielded Metal Arc Welding. Student will practice basic safety, principles, practices, and applications of SMAW, basic welding and cutting techniques in various positions. Weld problems, corrections and specific techniques will also be practiced in this course. (<i>Co-requisite:</i> WTC 152)	
WTC 153	Gas Metal and Flux Cored Arc Welding I	1
	This course is designed to teach the student the basic principles, practices, and applications of GMAW and FCAW. This course covers gas metal arc welding and flux cored arc welding in the flat and horizontal position. Students will be given classroom theory and hands on instruction in both processes. American Welding Society weld symbols will also be covered.	
WTC 154	Gas Metal and Flux Cored Arc Welding I Lab	2
	This course is designed to allow students to apply the theory and techniques taught in WTC 153 Gas Metal and Flux Cored Arc Welding I. Student will practice basic safety, principles, practices, and applications of GMAW and FCAW in the flat and horizontal positions. Weld problems, corrections and specific techniques will also be practiced in this course. (<i>Co-requisite:</i> WTC 153)	

WTC 155	Gas Metal and Flux Cored Arc Welding II 1 This course covers the most advanced GMAW/FCAW practices. The concentration will be on vertical and overhead welding techniques conforming to the AWS structural welding code. Weld problems, corrections and specific techniques will be covered in this course. (<i>Prerequisite:</i> WTC 151, WTC 152, WTC 153, WTC 154)
WTC 156	Gas Metal and Flux Cored Arc Welding II Lab 2 This course is designed to allow students to apply the theory and techniques taught in WTC 155 Gas Metal and Flux Cored Arc Welding II. Student will practice basic safety, principles, practices, and applications of GMAW and FCAW in the vertical and overhead positions. Weld problems, corrections and specific techniques will also be practiced in this course. (<i>Prerequisite:</i> WTC 151, WTC 152, WTC 153, WTC 154; <i>Co-requisite:</i> WTC 155)
WTC 157	Gas Tungsten Arc Welding 2 This course is designed to teach the student the basic safety, principles, practices, and applications of GTAW. This course covers GTAW welding theory including safety, tool usage, equipment set up and standard terms and definitions. Basic welding techniques using GTAW in the flat, horizontal, vertical and overhead positions will be taught. The course also covers related metallurgy, and how to identify weld problems and defects when using this process. (<i>Prerequisite:</i> WTC 151, WTC 152, WTC 153, WTC 154)
WTC 158	Gas Tungsten Arc Welding Lab 4 This course is designed to allow students to apply the theory and techniques taught in WTC 157 Gas Tungsten Arc Welding (GTAW). Student will practice basic safety, principles, practices, and applications of GTAW in the flat, horizontal, vertical and overhead positions. Weld problems, corrections and specific techniques will also be practiced in this course. (<i>Prerequisite:</i> WTC 151, WTC 152, WTC 153, WTC 154; <i>Co-requisite:</i> WTC 157)

Health Science Division -

Physical Therapist Assistant (AS)

Program Objective

The Physical Therapist Assistant program prepares students for entry-level positions in a variety of clinical settings. Graduates will be prepared to take the National Physical Therapy Exam for Physical Therapist Assistants.

Career Opportunities

Physical therapy is a very rewarding and diverse profession. Practicing physical therapist assistants have the option to work in a variety of settings, including: hospitals, inpatient and outpatient rehabilitation settings, skilled nursing facilities, private practices, home health, and schools. PTAs can also teach in physical therapist assistant programs or if they choose, can further their education in a variety of related fields.

Program Mission Statement

The mission of the Physical Therapist Assistant Program at Johnson College is to prepare students to be competent and caring entry-level physical therapist assistants who work under the direction and supervision of a physical therapist in a variety of settings. Students will be committed to developing and continuing professional competence, demonstrating lifelong learning, and adhering to the behavioral expectations outlined in the APTA Guide for Conduct and Standards of Ethical Conduct for the PTA.

What do Physical Therapist Assistants do?

Physical therapy plays a vital role in helping individuals achieve their optimal level of mobility and independence. Physical therapist assistants work under the direction and supervision of licensed physical therapists and work directly with patients to help improve quality of life. Physical therapist assistants must be well educated and personable.

Programmatic Accreditation

The Physical Therapist Assistant Program at Johnson College is accredited by the Commission on Accreditation in Physical Therapy Education, American Physical Therapy Association, 3030 Potomac Ave., Suite 100, Alexandria, VA 22305-3085; telephone: 703-706-3245; email: accreditation@apta.org; website: <http://www.captionline.org>. If needing to contact the program/institution directly, please call 570-702-8987 or email hdefazio@johnson.edu.

Program Goals/Student Learning Outcomes:

The goals of the Johnson College Physical Therapist Assistant Program are as follows:

1. To prepare graduates to meet the professional and licensure requirements necessary to function as entry-level PTA's under the direction and supervision of a physical therapist in a variety of clinical settings.
 - Outcome #1: Students/graduates will demonstrate competence implementing interventions identified in the plan of care under the direction and supervision of the physical therapist.
 - Outcome #2: Students/graduates will demonstrate competency performing components of data collection skills under the direction and supervision of the physical therapist.
 - Outcome #3: Students/graduates will complete thorough, accurate, logical, concise, timely, and legible documentation that meets the requirements of the facility.
 - Outcome #4: Graduates will pass the NPTE at a rate consistent with CAPTE requirements within one year of graduation.
 - Outcome #5: Graduates who seek employment will be employed in the field within one year of graduation.
2. To ensure students are prepared to meet the needs and expectations of members of society who seek physical therapy services.
 - Outcome #1: Students/graduates will exhibit conduct that reflects practice standards that are legal, ethical, and safe.
 - Outcome #2: Students/graduates will communicate effectively with other health care providers and with patients, family members, and caregivers in order to achieve patient outcomes based on the physical therapy plan of care.
 - Outcome #3: Students/graduates will respect and act with consideration for individual differences, values, and preferences of peers and patients.
3. To ensure students are able to use problem solving and critical thinking skills to respond appropriately to clinical situations they may encounter as a physical therapist assistant.
 - Outcome #1: Students/graduates will recognize when interventions should be modified or not provided due to changes in the patient's status or due to violations in practice guidelines and report this to the supervising physical therapist.
 - Outcome #2: Students/graduates will implement risk management strategies during all lab and clinical activities to ensure the safety of themselves and others.
4. To ensure students understand the value of volunteerism, leadership, and continued competence as physical therapist assistants.
 - Outcome #1: Students/graduates will develop a plan for continuing competence as a PTA.

Outcome #2: Students/graduates will participate in volunteer opportunities for professional and/or community organizations.

Department Goals/Outcomes:

The goals of the Johnson College Physical Therapist Assistant Department are as follows:

1. To ensure that educators of the program, both didactic and clinical provide instruction and guidance that meets the needs of the students and the program.

Outcome #1: Faculty will maintain current licensure in PA.

Outcome #2: Faculty will participate in continuing professional competence related to teaching responsibilities.

Outcome #3: Faculty will utilize effective instructional methods during didactic, laboratory, and clinical courses.

2. To provide students with a curriculum and resources that are current and in compliance with standards set forth by the Commission on Accreditation in Physical Therapy Education (CAPTE), by the American Physical Therapy Association (APTA), by the PA Physical Therapy state practice act, and by the institution.

Outcome #1: The curriculum will be reviewed annually by the Program Director, core faculty, and the Program Advisory Committee to ensure it is aligned with current requirements and practice trends.

Outcome #2: The program resources will be reviewed annually by the Program Director, core faculty, and the Program Advisory Committee to ensure adequacy to meet the needs of the program.

Special Admissions Requirements

Admittance to the Physical Therapist Assistant Program at Johnson College is based on a selective admission process that has been developed to ensure that students who are admitted to the Johnson College PTA Program are prepared to succeed in the program and enter the work force as competent entry-level physical therapist assistants. Students are admitted based on their merit without being discriminated against on the basis of race, religion, color, sex, age, national origin, non-job related disability, sexual orientation, or veteran status. Current enrollment is limited to 12 new students per year based on the number of applicants who meet the admission criteria and qualifications.

The procedure for applicants who desire to seek acceptance into the PTA program is as follows:

1. Applicants must contact the Johnson College enrollment staff to initiate the application process, which includes submitting an application
2. Students must meet the following minimum requirements:
 - a. SAT scores of 900 (combined math and verbal with not less than 450 on either section) or above or ACT scores 18 or above or Next Generation Accuplacer score of 237 or higher in Arithmetic and Writing.
 - b. GPA 2.67 or higher*
 - c. 1 year of Algebra with a “B-” or higher*
 - d. 2 years of English with a “B-” or higher*
 - e. 1 year of Biology with a “B-” or higher*
 - f. Recommended: 1 year of an additional life or physical science with a “B-” or higher*
 - g. PTA Admissions Questionnaire

- h. 2 Recommendations (1 from a Physical therapist or physical therapist assistant)
- i. 16 hours of observation (½ inpatient setting, ½ outpatient setting)

*(*denotes Prerequisites that can be completed in high school or college; college level courses will be weighted more in the scoring process)*

- 3. Once the applicant has completed all of the above Prerequisites, the admissions representative will send the file to the program director for review.

Special Enrollment Requirements

Prior to admission, students must complete 16 hours of observation in a physical therapy clinic with a Physical Therapist Assistant or a Physical Therapist and provide verification and complete the program admissions questionnaire.

Special Fees

In addition to tuition and program fees, students are responsible for the cost of physical exams and immunizations. Students are also required to join the American Physical Therapy Association as student PTA members.

Academic Progression (*within PTA Program*)

Students are required to show both didactic and clinical progression each semester in order to progress through the Physical Therapist Assistant Program.

- In order to start the technical phase of the program (3rd semester), students must meet the following requirements:
 - Students must have a 2.67 minimum GPA in general education courses
 - The student **MUST PASS** MTR 100, BIO 107, BIO 108, BIO 109, and BIO 110 with a grade of at least a B- (80%) or higher
 - Students must pass Anatomy modules on the skeletal, muscular, and nervous systems with a minimum score of 80% prior to starting technical courses
- The student **MUST PASS** each Physical Therapist Assistant didactic course with a grade of at least a C+ (76) or higher.
- In order to successfully pass each PTA course and progress through the program, students must:
 - receive a 76% or higher in each PTA course
 - meet requirements indicated in Written Exam Policy, Skills Checklist Policy, Practical Exam Policy, and Professional Behavior Policy
- The student **MUST PASS** each of the three clinical education courses (PTA 270, PTA 280, and PTA 290).
- The student **MUST** maintain a GPA each semester and cumulative of 2.33 or higher for all PTA courses.

*If any of the above requirements are not met, the student **will not be** allowed to progress in the PTA program.*

Clinical Education

Clinical education is a significant part of the Physical Therapist Assistant Program. Prior to the clinical education experiences, students must complete criminal background checks, fingerprinting, child abuse clearance, and drug testing. Students must satisfy the clinical requirements for both Johnson College and the clinical sites in order to successfully complete the program.

Physical Therapist Assistant Student Handbook

Physical Therapist Assistant students are responsible for reading and abiding by all policies and procedures in the Physical Therapist Assistant Student Handbook and Clinical Handbook.

Physical Therapist Assistant Major Courses

PTA 103	Intro. to Physical Therapy for the Physical Therapist Asst.	2
PTA 151	Patient Care	2
PTA 152	Patient Care Lab	1
PTA 153	Physical Therapy Procedures	2
PTA 154	Physical Therapy Procedures Lab	1
PTA 155	Principles of Therapeutic Exercise	1
PTA 156	Principles of Therapeutic Exercise Lab	1
PTA 221	Pathophysiology	2
PTA 223	Applied Kinesiology	3
PTA 224	Applied Kinesiology Lab	1
PTA 255	Interventions in Musculoskeletal	3
PTA 256	Interventions in Musculoskeletal Lab	1
PTA 257	Interventions in Neurology	3
PTA 258	Interventions in Neurology Lab	1
PTA 259	Topics in Rehabilitation	3
PTA 260	Topics in Rehabilitation Lab	1
PTA 270	Clinical Experience I (8 hours/15wks)	2
PTA 280	Clinical Experience II (40hrs/6wks)	5
PTA 290	Clinical Experience III (40hrs/6wks)	6
PTA 295	Professional Seminar	1
BIO 109	Human Anatomy & Physiology II	3
BIO 110	Human Anatomy & Physiology Lab II	1
MTR 100	Medical Terminology	1

Core Career Courses

ART 131	Prosthetics Design	3
BIO 107	Human Anatomy & Physiology I	3
BIO 108	Human Anatomy & Physiology I Lab	1
CSM 105	Customer Service	3
or HMN 101	Introduction to Humanities	
ENG 101	English Composition I	3
MAT 121	Introduction to Statistics	3
PSY 101	General Psychology	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate **67**

Physical Therapist Assistant
Associate in Science (AS)
Semester Program Outline

Semester 1		Credits
PTA 103	Intro to Physical Therapy for the Physical Therapist Assistant	2
BIO 107	Human Anatomy & Physiology I	3
BIO 108	Human Anatomy & Physiology I Lab	1
ENG 101	English Composition I	3
MTR 100	Medical Terminology	1
PSY 101	General Psychology	3
SSS 101	First-Year Experience	1
		14
Semester 2		
ART 131	Prosthetics Design	3
BIO 109	Human Anatomy & Physiology II	3
BIO 110	Human Anatomy & Physiology II Lab	1
CSM 105	Customer Service	3
or HMN 101	Introduction to Humanities	
MAT 121	Introduction to Statistics	3
		13
Semester 3		
<i>PTA 103*</i>	<i>Intro to Physical Therapy for the Physical Therapist Assistant</i>	2
PTA 151	Patient Care	2
PTA 152	Patient Care Lab	1
PTA 153	Physical Therapy Procedures	2
PTA 154	Physical Therapy Procedures Lab	1
PTA 155	Principles of Therapeutic Exercise	1
PTA 156	Principles of Therapeutic Exercise Lab	1
PTA 221	Pathophysiology	2
PTA 223	Applied Kinesiology	3
PTA 224	Applied Kinesiology Lab	1
		14
Semester 4		
PTA 255	Interventions in Musculoskeletal	3
PTA 256	Interventions in Musculoskeletal Lab	1
PTA 257	Interventions in Neurology	3
PTA 258	Interventions in Neurology Lab	1
PTA 259	Topics in Rehabilitation	3
PTA 260	Topics in Rehabilitation Lab	1
PTA 270	Clinical Experience I (40hrs/3wks) (early start)	2
		14
Summer Sessions		
Summer Session I		
PTA 280	Clinical Experience II (40hrs/6wks)	5
PTA 295	Professional Seminar	1
Summer Session II		
PTA 290	Clinical Experience III (40hrs/8wks)	6
		12
Minimum Credits to Graduate		67

**For Spring enrolled students*

Physical Therapist Assistant Course Descriptions

Course No.	Course Title	Credits
PTA 103	Introduction to Physical Therapy for the Physical Therapist Assistant This course introduces the student to the physical therapy profession. Topics include history of physical therapy, the variety of physical therapy practice settings, an introduction to the Guide to PT Practice, the Code of Ethics and Standards of Ethical Conduct for the PT/PTA, the laws and regulations that oversee the profession, an introduction to principles of teaching and learning as they apply to patient instruction, the PT/PTA relationship, the PTA/patient relationship, cultural competence, patient confidentiality, and Evidence Based Practice (EBP).	2
PTA 151	Patient Care This course introduces students to the skills necessary to provide basic patient management during physical therapy interventions. Topics include assessing/monitoring vital signs, body mechanics, positioning and draping, bed mobility, transfer techniques, gait training, appropriate selection and use of assistive devices, wheelchair management, and documentation. <i>Prerequisites:</i> Completion of all Core Career Courses requirements.	2
PTA 152	Patient Care Lab This lab course aligns with PTA 151 and focuses on the application and practice of the skills learned in PTA 151 with special attention to technique and safety. The focus is on general patient care skills required of a PTA, including, but not limited to: assessing/monitoring vital signs, body mechanics, positioning and draping, bed mobility, transfer techniques, gait training, appropriate selection and use of assistive devices, wheelchair management. <i>Prerequisites:</i> Completion of all Core Career Courses requirements.	1
PTA 153	Physical Therapy Procedures This course introduces students to the therapeutic use of physical agents. Topics studied and applied include superficial heat, cryotherapy, ultrasound, diathermy, traction, electrical modalities, light therapy, biofeedback, and ultraviolet radiation. Students will be introduced to principles, indications, contraindications, precautions, and application techniques. <i>Prerequisites:</i> Completion of all core career course requirements.	2
PTA 154	Physical Therapy Procedures Lab This lab course aligns with PTA 153 and focuses on the application of the therapeutic physical agents with special attention to technique and safety. Students will be required to demonstrate competency on the application and judicious use of superficial heat, cryotherapy, ultrasound, diathermy, traction, electrical modalities, biofeedback, light therapy, and ultraviolet radiation. <i>Prerequisites:</i> Completion of all Core Career Courses requirements.	1
PTA 155	Principles of Therapeutic Exercise	1

This course introduces the PTA student to the fundamentals, techniques, and application of therapeutic exercise as it relates to the understanding and implementing the plan of care developed by the physical therapist. Topics include principles of aerobic exercise, stretching, and improving muscle performance for the prevention, treatment, and management of injuries. *Prerequisites:* Completion of all Core Career Courses requirements.

- | | |
|----------------|--|
| PTA 156 | <p>Principles of Therapeutic Exercise Lab 1</p> <p>This lab course aligns with PTA 155 and focuses on the implementation of therapeutic interventions commonly used in physical therapy clinics with special attention to technique and safety. The focus is on therapeutic interventions including but not limited to: strengthening, stretching, aerobic exercise, PNF, NDT, motor learning, and functional activities. <i>Perquisites:</i> Completion of all Core Career Courses requirements.</p> |
| PTA 221 | <p>Pathophysiology 2</p> <p>This course addresses the processes of inflammation and healing and disease processes relevant for the PTA student and practitioner. Topics include pathologies of the immune system, cardiovascular system, respiratory system, musculoskeletal system, neurological system, integumentary system, digestive system, urinary system, and reproductive system, in addition to topics related to neoplasms, the intensive care unit, and the geriatric patient. Students will discuss the medical and pharmaceutical management of these pathologies and the effect on the provision of physical therapy services. <i>Prerequisites:</i> Completion of all Core Career Courses requirements.</p> |
| PTA 223 | <p>Applied Kinesiology 3</p> <p>This course delivers an in-depth study of the musculoskeletal system and body movement. The study of human movement from the point of view of the physical sciences. Fundamentals of human motion are examined from the anatomical, physiological and biomechanical perspectives with an emphasis on motor skill application. <i>Prerequisites:</i> Completion of all Core Career Courses requirements.</p> |
| PTA 224 | <p>Applied Kinesiology Lab 1</p> <p>This lab course aligns with PTA 223 and focuses on the application of the biomechanical principles and muscle actions of each region to gait and postural analysis, manual muscle testing, and goniometry with attention to safety and technique. <i>Prerequisites:</i> Completion of all Core Career Courses requirements.</p> |
| PTA 255 | <p>Interventions in Musculoskeletal 3</p> <p>This course includes an exploration of pathology, prevention and management of injuries and conditions associated each region of the musculoskeletal system with a focus on the role of the physical therapist assistant in implementing a physical therapy plan of care. <i>Prerequisites:</i> Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221, PTA 223, PTA 224.</p> |
| PTA 256 | <p>Interventions in Musculoskeletal Lab 1</p> <p>This lab course aligns with PTA 255 and focuses on the integration and practice of previously learned material and new skills / techniques / interventions commonly used to treat pathologies of the musculoskeletal system with a focus on the role of the physical therapist assistant in implementing a physical therapy plan of care.</p> |

Prerequisites: Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221, PTA 223, PTA 224.

- PTA 257** **Interventions in Neurology** **3**
This course is an introduction to neuro-rehabilitation for the PTA. Topics include but are not limited to normal movement development across the lifespan, motor control, motor learning, and neuroplasticity, along with an exploration of pathology and management of a variety of neurological disorders including but limited to CVA, spinal cord injury, traumatic brain injury, and degenerative neurological conditions.
Prerequisites: Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221, PTA 223, PTA 224.
- PTA 258** **Interventions in Neurology Lab** **1**
This lab course aligns with PTA 257 and focuses on the integration of previously learned material and new skills/techniques into the comprehensive rehabilitation of selected neurological disorders with a focus on the role of the physical therapist assistant in implementing a physical therapy plan of care. *Prerequisites:* Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221, PTA 223, PTA 224.
- PTA 259** **Topics in Rehabilitation** **3**
This course will explore different topics in rehabilitation including cardio/ pulmonary issues, diabetes, amputations, burns, prosthetics/orthotics, gender specific issues, and vestibular issues. This course will provide the students with the opportunity to incorporate their knowledge of treatment procedures and techniques previously learned to specific populations in rehabilitation. *Prerequisites:* Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221, PTA 223, PTA 224.
- PTA 260** **Topics in Rehabilitation Lab** **1**
This lab course aligns with PTA 259 and focuses on the integration of previously learned material and new skills/techniques into the comprehensive rehabilitation of a variety of populations in rehabilitation with a focus on the role of the physical therapist assistant in implementing a physical therapy plan of care. *Prerequisites:* Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221, PTA 223, PTA 224.
- PTA 270** **Clinical Experience I** **2**
This is the first of three clinical experiences. It is an integrated clinical experience that will take place during the students' fourth semester in the PTA program. The focus is on the application of knowledge, skills and behaviors that the PTA student has learned during their didactic and practical classroom work. During this affiliation, students should become comfortable with basic patient care skills. Students will have the opportunity to gain proficiency in the skills they have learned in prerequisite courses, including functional training, application of physical agents, mechanical modalities, electrotherapeutic modalities, and subsequent data collection. Students will have the opportunity to participate in direct patient care under the direction and direct supervision of either a licensed physical therapist or a physical therapist and physical therapist assistant team assigned by the facility. *Prerequisites:* Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221,

PTA 223, PTA 224. Also must be enrolled in PTA 255, PTA 256, PTA 257, PTA 258, PTA 259, and PTA 260.

- PTA 280** **Clinical Experience II** **5**
- This is the second of three clinical experiences that will take place during the first six weeks of the students' fifth semester in the PTA program. The focus is on the application of knowledge, skills and behaviors that the PTA student has learned during their didactic and practical classroom work. During the six weeks, students have the opportunity to participate in direct patient care under the direction and direct supervision of either a licensed physical therapist or a physical therapist and physical therapist assistant team assigned by the facility. At this point, students have completed all didactic coursework and should be able to apply those skills to real patient care. In addition to the basic patient care skills, students should be able to implement and progress treatment plans outlined by a physical therapist in a professional manner. *Prerequisites:* Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221, PTA 223, PTA 224, PTA 255, PTA 256, PTA 257, PTA 258, PTA 259, PTA 260, & PTA 270.
- PTA 290** **Clinical Experience III** **6**
- This final clinical experience will take place after **PTA 280** in the fifth semester. The focus of this final clinical experience is to prepare the PTA student to function as an entry-level PTA. During the six weeks, students have the opportunity to participate in direct patient care under the direction and direct supervision of either a licensed physical therapist or a physical therapist and physical therapist assistant team assigned by the facility. Students have completed all didactic coursework and have completed 360 hours of clinical education experience. As in **PTA 270** and **280**, students should be competent at all basic patient care skills, at following a physical therapist's plan of care and at progressing patients as appropriate. They should be independent with documentation and with working under the rules outlined by the APTA, the state, and the specific clinic. *Prerequisites:* Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221, PTA 223, PTA 224, PTA 255, PTA 256, PTA 257, PTA 258, PTA 259, PTA 260, PTA 270, & PTA 280.
- PTA 295** **Professional Seminar** **1**
- This course will provide students with the tools necessary for professional development after graduation, including but not limited to resume writing and preparation for the NPTE for PTA's. *Prerequisites:* Completion of PTA 103, PTA 151, PTA 152, PTA 153, PTA 154, PTA 155, PTA 156, PTA 221, PTA 223, PTA 224, PTA 255, PTA 256, PTA 257, PTA 258, PTA 259, PTA 260.

Health Science Division -

Radiologic Technology (AS)

Program Objective

The Radiologic Technology program prepares students for entry-level positions in a hospital or outpatient clinical setting. Graduates will be prepared to take the national certification for the American Registry of Radiologic Technologists (ARRT) examination to become a registered technologist.

Career Opportunities

Graduates can work as technologists in hospitals, medical service centers, and outpatient imaging centers, or with additional training and education, career advancement into other imaging modalities is possible.

The Radiologic Technology program at Johnson College offers several career and employment post-graduation paths. Upon successfully passing the ARRT national certification examination, students may continue their education in a nine-month certificate program in MRI or CT scanning.

Students may also further their education to complete an online Bachelor of Science degree in Applied Health Studies (BAH) through an articulation agreement with Pennsylvania College of Technology.

Program Mission Statement

The mission of the Radiologic Technology Program at Johnson College is to develop competent, professional radiographers whose expertise will meet the community they serve by providing patient-centered care in a professional, compassionate and responsible manner.

Program Vision Statement

The vision of the Radiologic Technology Program is consistent with the vision of Johnson College. The vision of the Radiologic Technology Program is to achieve excellence by the means of the outcome of assessments and continuous improvement. Johnson College will provide the students with the industrial skills and learning opportunities to foster critical thinking and problem solving.

What do Radiologic Technologists do?

The Radiologic Technologist must be well educated in:

- | | | |
|-----------------------|---------------------|----------------------|
| • Anatomy | Patient positioning | Exam techniques |
| • Equipment protocols | Radiation safety | Radiation protection |
| • Basic patient care | | |

The technologist will be responsible for patient assessment and preparation for radiologic procedures and image production. You are an important part of the diagnostic team responsible for producing a quality diagnostic image. The physicians that are specialized in the field of radiology (Radiologists) interpret these images to obtain an accurate diagnosis to rule out disease, injury, and develop a course of treatment.

Programmatic Accreditation

The Radiologic Technology program is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT) 20 North Wacker Drive, Suite 2850 Chicago, IL 60606-3182
Phone: (312) 704-5300 E-mail: mail@jrcert.org Website: www.jrcert.org

Program Goals

Goal 1: Graduates will demonstrate clinical competency

Student Learning Outcomes -

- Students will exhibit competence in positioning skills.
- Students will provide appropriate patient care.
- Students will practice safe radiation techniques.

Goal 2: Graduates will utilize critical thinking skills

Student Learning Outcomes –

- Students will be able to assess patient condition and adjust the procedures accordingly.
- Students will be able to critique radiographic images to ensure acceptable diagnostic quality.

Goal 3: Graduates will demonstrate effective communication skills

Student Learning Outcomes –

- Students will demonstrate the effective use of verbal communication.
- Students will demonstrate the ability to communicate effectively in writing.

Special Admissions Requirements

A minimal Scholastic Aptitude Test (SAT) score of 900 for combined math and verbal or a minimal American College Test (ACT) of 20 is required for admission. The writing component of the SAT will be reviewed by the Enrollment Office and may assist in determining placement and/or admission to the College. Applicants must take either Biology or Physics and attain a grade of “C” or higher.

1. Students must meet the following minimum require:
 - SAT scores (500 on either section) or ACT scores (Composite score of 18) or Next Generation Accuplacer score (250 in Arithmetic and Writing)
 - GPA 3.00 or higher*
 - 2 years of English with a “B-” or higher*
 - 1 year of Algebra I with a “B-” or higher*
 - 1 year of Algebra II with a “B-” or higher*
 - 1 year of Biology with a “B-” or higher*
 - Recommended: 1 year of an additional life science or Physics with a “B-” of higher*
 - Radiologic Technology Questionnaire

Retention

Students are required to show both didactic and clinical progression each semester in order to progress through the Radiologic Technology program:

- The student **MUST PASS** each Radiologic didactic course, as well as related courses MTR 100, BIO 107, BIO 108, BIO 109 and BIO 110 with a grade of at least a B- (80) or higher.
- In order to successfully pass each RAD course and progress through the program, students must:
 - receive an 76% or higher in each lecture and lab portion of the course
 - receive an overall grade of 80% or higher

- achieve a written exam average (written exams + final exam) of 76% or higher
- complete all skill checklists
- pass each Practical Exam with a 80% or higher
- demonstrate appropriate professional behaviors as assessed by the Professional Behavior Assessment Form.

If any of the above criteria are not met, students may fail the course and will not be able to progress in the Radiology program. If students do not obtain an 80 written exam average, but meet all of the other criteria, the students' grade will be based on the written exam average. A student who fails the practical will receive an F in the course.

- The student **MUST PASS** each of the four clinical education courses (RAD 163, RAD 165, RAD 251, RAD 259).
- The student **MUST PASS** all laboratory practical exams, with a grade of at least a 76% or better.
- The student **MUST** demonstrate appropriate Professional Behaviors

Please refer to the **Radiologic Technology Student Handbook** for further information.

Throughout the program of study, students are required to maintain a cumulative Grade Point Average (GPA) of at least 2.00 and a minimum grade of 2.67 (B-) in each Radiologic Technology major course in order to remain in the program. Students who do not meet the GPA requirements for Radiologic Technology subjects will be placed on Academic Probation as outlined in the **Radiologic Technology Student Handbook** at the instructor's discretion.

Clinical Practicums

Clinical practicum rotations at approved sites must be completed. Students must satisfy the clinical requirements of both Johnson College and the clinical provider as a condition of graduation. Clinical sites require criminal background checks, fingerprinting, child abuse clearance and drug testing. Clinical sites may bar students from clinical rotations if a criminal record exists or a drug test has a positive result.

Student Handbook

Radiologic Technology students are responsible for reading and abiding by all policies and procedures in the **Radiologic Technology Student Handbook**.

Radiologic Technology Major Courses

RAD 151	Radiologic Positioning I	3
RAD 152	Radiologic Positioning I Lab	1
RAD 153	Radiologic Exposures & Principles I	3
RAD 154	Radiologic Exposures & Principles I Lab	1
RAD 155	Patient Care I	2
RAD 157	Radiologic Positioning II	2
RAD 158	Radiologic Positioning II Lab	1
RAD 159	Radiologic Exposures & Principles II	3
RAD 161	Patient Care II	2
RAD 163	Clinical Practicum I	2
RAD 165	Clinical Practicum II	4
RAD 251	Clinical Practicum III	2
RAD 253	Radiation Biology & Protection	3
RAD 255	Image Analysis	2
RAD 259	Clinical Practicum IV	3
RAD 261	Radiologic Pathology	2
RAD 263	Advanced Medical Imaging	2
RAD 295	Professional Seminar	2

Related Courses

BIO 107	Human Anatomy & Physiology I	3
BIO 108	Human Anatomy & Physiology I Lab	1
BIO 109	Human Anatomy & Physiology II	3
BIO 110	Human Anatomy & Physiology II Lab	1
MTR 100	Medical Terminology	1

Core Career Courses

COM ###	Communications Elective	3
ENG 101	English Composition I	3
HMN 101	Introduction to Humanities	3
MAT 101	College Algebra I and Trigonometry	3
MAT 121	Introduction to Statistics	3
PHY 101	Introductory Physics	3
PSY 101	General Psychology	3
or SOC 101	Introduction to Sociology	
SSS 101	First-Year Experience	1

Minimum Credits to Graduate **71**

Radiologic Technology

Associate in Science (AS)

Semester Program Outline

Semester 1		Credits
RAD 151	Radiologic Positioning I	3
RAD 152	Radiologic Positioning I Lab	1
RAD 153	Radiologic Exposures & Principles I	3
RAD 154	Radiologic Exposures & Principles I Lab	1
RAD 155	Patient Care I	2
BIO 107	Human Anatomy & Physiology I	3
BIO 108	Human Anatomy & Physiology I Lab	1
MAT 101	College Algebra I and Trigonometry	3
MTR 100	Medical Terminology	1
SSS 101	First-Year Experience	1
		19
Semester 2		
RAD 157	Radiologic Positioning II	2
RAD 158	Radiologic Positioning II Lab	1
RAD 159	Radiologic Exposures & Principles II	3
RAD 161	Patient Care II	2
RAD 163	Clinical Practicum I	2
BIO 109	Human Anatomy & Physiology II	3
BIO 110	Human Anatomy & Physiology II Lab	1
ENG 101	English Composition I	3
		17
Summer Session I		
RAD 165	Clinical Practicum II	4
Semester 3		
RAD 251	Clinical Practicum III	2
RAD 253	Radiation Biology & Protection	3
RAD 255	Image Analysis	2
COM ####	Communications Elective	3
PHY 101	Introductory Physics	3
PSY 101	General Psychology	3
or SOC 101	Introduction to Sociology	
		16
Semester 4		
RAD 259	Clinical Practicum IV	3
RAD 261	Radiologic Pathology	2
RAD 263	Advanced Medical Imaging	2
RAD 295	Professional Seminar	2
HMN 101	Introduction to Humanities	3
MAT 121	Introduction to Statistics	3
		15
Minimum Credits to Graduate		71

Radiologic Technology Course Descriptions

Course No.	Course Title	Credits
RAD 151	Radiologic Positioning I This course introduces the student to basic terminology used in radiographic positioning. The curriculum provides a comprehensive study of theory and principles of basic positions of the upper and lower extremities, bony thorax, chest and abdomen. This course is designed to synthesize the information and exhibit the knowledge for criteria, centering, and positioning of anatomy to produce a diagnostic image.	3
RAD 152	Radiologic Positioning I Lab This course introduces the student to the practical knowledge and application of positioning. The curriculum provides a comprehensive application of the principals of basic positions of the upper and lower extremities, bony system. It is designed to develop competency through laboratory practicum applications. Laboratory experiences utilizes phantom apparatuses and an energized lab to complement the classroom portion of the course.	1
RAD 153	Radiologic Exposures & Principles I This course is an introduction to the fundamental concepts and techniques relating to the production of x-rays. Emphasis is placed on the factors affecting an acceptable radiograph: contrast, receptor exposure, spatial resolution and all of the geometric properties associated with diagnostic imaging.	3
RAD 154	Radiologic Exposures & Principles I Lab This course is a laboratory experience utilizing model apparatus in an energized lab which allows the students to apply the concepts acquired in the classroom environment.	1
RAD 155	Patient Care I This course will provide a comprehensive study of basic concepts regarding patient care. The student will study proper body mechanics, transfer techniques, medical asepsis, communication skills with patients and co-workers, how to measure vital signs, how to deal with medical emergencies, and isolation techniques. It progresses into theory and advanced application of the clinical concepts of patient care and medical techniques in the radiology department.	2
RAD 157	Radiologic Positioning II This course is a continuation of RAD 151. The course is designed to develop competency in diagnostic procedures of the vertebral column, cranium, gastrointestinal system, biliary tract, and urinary system. (Prerequisites: RAD 151, RAD 152, RAD 153, RAD 154, RAD 155)	2
RAD 158	Radiologic Positioning II Lab This course is a continuation of RAD 151 and RAD 152. The course is designed to develop competency in diagnostic procedures of the vertebral column, cranium, gastrointestinal system, biliary tract, and urinary system. Competence will be demonstrated on a weekly basis in a laboratory setting. Further practice will come in	1

the actual clinical setting under the guidance of an assigned registered clinical radiographer. (*Prerequisites:* RAD 151, RAD 152, RAD 153, RAD 154 RAD 155)

- RAD 159 Radiologic Exposures & Principles II 3**
A continuation of RAD 153, this course is designed to acquaint students with the comprehensive analysis of the factors affecting image quality requiring integration of all exposure and technical factors previously learned. The student will learn the components, principles and operation of fluoroscopy, mobile and digital radiology imaging systems and the factors that impact image acquisition, display, and retrieval in radiology. The details of Quality Assurance, Quality Management, and Quality Control will also be reviewed in this course. (*Prerequisites:* RAD 153, RAD 154)
- RAD 161 Patient Care II 2**
This course will discuss the use of pharmacodynamics and drug classifications; it focuses on radiopaque contrast media used in imaging procedures. Pharmacokinetics coverage describes how drugs are absorbed, metabolized, distributed, and eliminated. The second half of the course will review today's health care and hospital environment, proper documentation, accrediting bodies, and the professional ethics guiding the health worker today. Professionalism and legal implications will also be discussed. This course will also include legal doctrines and patient consent forms. (*Prerequisite:* RAD 155)
- RAD 163 Clinical Practicum I 2**
An introduction to the clinical radiographic experience applies radiographic theory and provides learning experiences to help the student acquire expertise and proficiency in a variety of diagnostic radiographic procedures at specified levels of competency. Students will work on various radiographic equipment, and show competency in anatomy and physiology and radiographic positioning. Additionally, students will integrate knowledge of patient care, medical ethics and apply critical thinking skills into daily radiographic practice. Students will spend a minimum of 15 per week hours in the clinical environment. Students must have verification of current CPR certification, annual health examination, immunizations, and all current clearances required by Johnson College. Students are responsible for their own expenses for travel to assigned clinical site, which maybe up to 90 miles from the campus. (*Prerequisites:* RAD 151, RAD 152, RAD 153, RAD 154, RAD 155)
- RAD 165 Clinical Practicum II 4**
A continuation of the clinical radiography experience applies radiographic theory and provides learning experiences to help the student acquire expertise and proficiency in a variety of diagnostic radiographic procedures at specified levels of competency. Students will display basic radiation protection standards, become familiar with various radiographic equipment, and show competency in anatomy and physiology as well as radiographic positioning. Additionally, students will integrate knowledge of patient care, develop critical thinking skills and medical ethics into daily radiographic practice. Students will spend a minimum of 40 hours in the clinical environment per week, which will include one weekend shift. Students must have verification of current CPR certification, annual health examination immunizations, and all current clearances required by Johnson College. (*Prerequisites:* RAD 157, RAD 158, RAD 159, RAD 161, RAD 163)

RAD 251	Clinical Practicum III 2 A continuation of the clinical radiography experience applies radiographic theory and provides learning experiences to help the student acquire expertise and proficiency in a variety of diagnostic radiographic procedures at specified levels of competency. Students will work on various radiographic equipment, and show competency in anatomy and physiology and radiographic positioning. Additionally, students will integrate knowledge of patient care, develop critical thinking skills and medical ethics into daily radiographic practice. Students will spend a minimum of 16 hours per week in the clinical environment. Students must have verification of current CPR certification, annual health examination, immunizations and all current clearances required by Johnson College. (<i>Prerequisite:</i> RAD 165)
RAD 253	Radiation Biology & Protection 3 This course describes the effects of ionizing radiation on cells in the human body and how the effects of x-ray radiation affect biological tissue. Radiation protection, monitoring, and dose limits will be reviewed in this course with an emphasis on the ALARA concept. The course will also review and define the roles of the regulatory agencies and their involvement in radiation protection. (<i>Prerequisites:</i> RAD 159, RAD 161)
RAD 255	Image Analysis 2 This course is designed to provide students with a basis for analyzing radiographic images for diagnostic purposes. Students will become acquainted with the importance of minimum imaging standards, problem solving technique for image evaluation and the factors that can affect the image quality. Students will be responsible for critiquing radiographs to decide whether they are diagnostically acceptable and assure consistency in the production of quality images. (<i>Prerequisites:</i> RAD 157, RAD 158, RAD 159)
RAD 259	Clinical Practicum IV 3 The clinical radiography experience applies radiographic theory and provides learning experiences to help the student acquire expertise and proficiency in a variety of diagnostic radiographic procedures at specified levels of competency. Students will work on various radiographic equipment, and show competency in anatomy and physiology and radiographic positioning. Additionally, students will integrate knowledge of patient care, develop critical thinking skills and medical ethics into daily radiographic practice. Students will spend a minimum of 24 hours per week in the clinical environment. During this final practicum, students will be offered an optional rotation through specialized modalities. Students must have verification of current CPR certification, annual health examination, immunizations and all current clearances required by Johnson College. (<i>Prerequisite:</i> RAD 251)
RAD 261	Radiologic Pathology 2 This course emphasizes human pathology on a gross anatomic level. Inflammatory, immunology, infections, traumatic and neoplastic processes will be emphasized. Specific diseases will be studied in further depth from an organ system approach. (<i>Prerequisites:</i> RAD 157, RAD 159)

- RAD 263 Advanced Medical Imaging 2**
This course familiarizes the student with the different modalities within the field of radiology. The students will explore topics in specialized areas such as CT, MRI, Nuclear Medicine, Mammography, PET, Bone Densitometry, Ultrasound, and Radiation Oncology. The students will review, cross sectional anatomy, trauma radiology, myelograms, arthrograms and pediatric imaging.
(*Prerequisites:* BIO 109, BIO 110, RAD 251)
- RAD 295 Professional Seminar 2**
This course is established to assist the student in preparing for the registry examination given by the American Registry of Radiologic Technologists (ARRT). (*Prerequisite:* RAD 251, RAD 253, RAD 255) *Must pass competency examination with a minimum score of 76%.*)

Health Science Division -

Veterinary Nursing (AS)

Program Objective

The Veterinary Nursing program prepares students to join an animal-care team as entry-level technicians. Technicians collect samples, perform lab tests, take radiographs, prepare the surgical suite, assist in surgery, monitor anesthesia, provide general nursing care to patients, and assume other clinical duties. Second-year students complete clinical rotations in the Animal Care Center, a pet wellness center on the campus of Johnson College. The program prepares students to become Certified Veterinary Technicians (CVT) upon passing the Veterinary Technician National Exam (VTNE).

Career Opportunities

Graduates work in many areas of veterinary medicine such as small and large animal clinics, research facilities, academia, zoos, laboratories, pharmaceutical companies, and government agencies such as the United States Department of Agriculture (USDA).

Program Learning Goals

Goal 1: Graduates will be able to function as an entry-level certified veterinary technician in a variety of clinical settings.

Student Learning Outcomes:

- Demonstrate competence in the skills needed as outlined by the CVTEA, Policies & Procedures Manual, Appendix I, and required tasks for licensure/certification as an entry level Veterinary Nursing Technician.
- Demonstrate preparedness and knowledge of skills based on the 9 VTNE prep exam domain scores
- Conduct themselves in a manner in accordance with the standards set forth by the AVMA-CVTEA & the Johnson College Veterinary Nursing Program for a Veterinary Technician.

Goal 2: Graduates will develop analytical, critical thinking, decision-making and psychomotor skills necessary to perform in the animal health care industry.

Student Learning Outcomes:

- Demonstrate competency in medical nursing, surgical nursing & anesthetic nursing
- Competently perform laboratory procedures
- Demonstrate proficiency in a pharmacy setting and understand pharmacologic concepts
- Produce diagnostic images and understand radiologic concepts

Goal 3: Graduates will contribute as an integral member of a veterinary health care team while adhering to professional and ethical standards including compassion for clients and animals and personal responsibility.

Student Learning Outcomes:

- Demonstrate competence in performing hospital and office procedures, maintaining client relations and public communication.

- Effectively communicate with the veterinary health care team and maintain a safe work environment for clients, animals and staff.
- Demonstrate understanding of the laws, ethics and professional organizations that govern the veterinary profession

Goal 4: Graduates will obtain the required skills to practice health promotion and animal disease prevention.

Student Learning Outcomes:

- Recognize significant zoonotic and animal diseases and the appropriate diagnostics, treatments and prevention of those diseases.
- Contribute to improved public health by promoting biosecurity measures and disease prevention through communication with clients.

Immunizations & Scrubs

In addition to tuition and fees, students are responsible for the costs of immunizations. Veterinary Nursing students will be required to purchase two sets of Johnson College scrubs to be worn during VET275/277. The student will also be required to wear these scrubs during the entire 5-week internship (VET299). The uniform company will come onto campus to fit the students and place orders.

Programmatic Accreditation

The Veterinary Nursing program is accredited by the American Veterinary Medical Association (AVMA).

Special Admissions Requirements

A minimal high school grade point average (GPA) of 2.5 along with a minimal Scholastic Aptitude Test (SAT) score of 900 (math and verbal) total or; Placement Exam in lieu of SAT scores or; a minimal American College Test (ACT) of 18 is required for admission.

1 year of Algebra with a 76% or higher
 2 year of English with a 76% or higher
 2 years of Biology or a Life Science with a 76% or higher
 Recommended: 1 year of Chemistry with a 76% or higher

Applicants must take 2 years of Biology and/or Life Sciences, and attain a grade of 76% or higher. A completed Veterinary Nursing questionnaire must be submitted and ten hours of observation at a veterinary clinic is required. Any personal references must be from a veterinarian/veterinary staff or animal husbandry individual.

Special Program Enrollment Requirements

Prior to the start of the first semester, students must provide proof of tetanus and rabies. The Center for Disease Control considers individuals working with animals (including veterinarians and their staff) to be in the high-risk category. The CDC's recommendation for these individuals is to obtain a primary course of rabies vaccinations followed by serologic testing or booster vaccination every two years. Rabies inoculation is in order to participate in any laboratory and clinical activities involving animals.

Retention

Veterinary Nursing students are required to maintain a cumulative 2.33 GPA (76% or higher) in VET/MAT 205 courses. Additionally, a student must receive an average grade of “C+” (76%) or higher in each VET/MAT 205 course. If the student’s programmatic GPA falls below 2.33, the student will be placed on academic probation. The following semester, your GPA must be brought up to a cumulative 2.33 in all courses listed above or you will be dismissed from the program. If a student receives a grade below a “C+” (76%), the student must re-take the course at their own expense in order to successfully complete the program. Please refer to the Veterinary Nursing Academic Progression Policy for details concerning academic progress details.

VET 275 and VET 277, Senior Clinical Rotations I and II are capstone courses. The clinical experiences are to provide an environment allowing students to incorporate and enhance all AVMA required tasks. Students must receive a score of 76% or better on Clinical Rotation written final exams, oral/practical exams, and instructor evaluations of students. Students who do not obtain a minimum score of 76% in any of the three evaluations will receive a letter grade of “C” for the rotation and must repeat the course. Students are also required to adhere to strict guidelines on patient neglect or cruelty.

Internship

A five-week internship at an approved site must be completed after the last semester of the second year. Students must satisfy the internship requirements of both Johnson College and the internship provider as a condition of graduation.

Some internship sites may require a criminal background check and/or a drug test. Internship sites may bar students from an internship if a criminal record exists or a drug test has a positive result. Costs for travel to and from an internship site are the responsibility of the student.

Rabies / Tetanus Inoculations:

The Center for Disease Control considers individuals working with animals (including veterinarians and their staff) to be in the high-risk category. The CDC’s recommendation for these individuals is to obtain a primary course of rabies vaccinations followed by serologic testing or booster vaccination every two years.

Vaccinations against tetanus and rabies are required for all Veterinary Nursing students. Proof of rabies and tetanus inoculation prior to handling animals is required.

Student Handbook

Veterinary Nursing students are responsible for reading and abiding by all policies and procedures in the **Veterinary Nursing Student Handbook**.

Veterinary Nursing Major Courses

MAT 205	Medicine & Mathematics	2
VET 151	Intro. to Veterinary Tech. / Clinical Management	1
VET 153	Clinical Applications for Large Animals	2
VET 154	Clinical Applications for Large Animals Lab	1
VET 155	Clinical Applications for Small Animals	2
VET 156	Clinical Applications for Small Animals Lab	1
VET 157	Animal Anatomy and Physiology I	3
VET 158	Animal Anatomy and Physiology Lab I	1
VET 159	Animal Anatomy and Physiology II	3
VET 160	Animal Anatomy and Physiology Lab II	1
VET 161	Parasitology & Immunology	2
VET 162	Parasitology & Immunology Lab	1
VET 251	Pharmacology & Anesthesia	3
VET 253	Clinical Pathology	2
VET 254	Clinical Pathology Lab	1
VET 259	Surgical Nursing I	2
VET 263	Surgical Nursing II	2
VET 267	Veterinary Radiology	1
VET 268	Veterinary Radiology Lab	1
VET 269	Intensive Care Applications	3
VET 271	Diseases & Zoonoses	3
VET 275	Clinical Rotation - Surgery	3
VET 277	Clinical Rotation - Medicine	3
VET 280	Kennel Rotation I	1
VET 282	Kennel Rotation II	1
VET 295	Veterinary Technology Professional Seminar	1
VET 299	Internship	4

Core Career Courses

CHM 101	Fundamentals of Chemistry	3
CHM 102	Fundamentals of Chemistry Lab	1
COM 112	Public Speaking	3
CPT 101	Microcomputer I	3
CSM 105	Customer Service and Our World	3
ENG 101	English Composition I	3
MAT 101	College Algebra I and Trigonometry	3
ART ###	Art Elective	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate **74**

Veterinary Nursing
Associate in Science (AS)
Semester Program Outline

Semester 1		Credits
VET 151	Introduction to Veterinary Technology/Clinical Management	1
VET 153	Clinical Applications for Large Animals	2
VET 154	Clinical Applications for Large Animals Lab	1
or VET 155	Clinical Applications for Small Animals	2
VET 156	Clinical Applications for Small Animals Lab	1
VET 157	Animal Anatomy & Physiology I	3
VET 158	Animal Anatomy & Physiology Lab I	1
CHM 101	Fundamentals of Chemistry	3
CHM 102	Fundamentals of Chemistry Lab	1
MAT 101	College Algebra I and Trigonometry	3
SSS 101	First-Year Experience	1
		16
Semester 2		
VET 153	Clinical Applications for Large Animals	2
VET 154	Clinical Applications for Large Animals Lab	1
or VET 155	Clinical Applications for Small Animals	2
VET 156	Clinical Applications for Small Animals Lab	1
VET 159	Animal Anatomy and Physiology II	3
VET 160	Animal Anatomy and Physiology Lab II	1
VET 161	Parasitology & Immunology	2
VET 162	Parasitology & Immunology Lab	1
ENG 101	English Composition I	3
CPT 101	Microcomputer I	3
MAT 205	Medicine & Mathematics	2
		18
Semester 3		
VET 251	Pharmacology & Anesthesia	3
VET 253	Clinical Pathology	2
VET 254	Clinical Pathology Lab	1
VET 259	Surgical Nursing I	2
VET 275	Clinical Rotation - Surgery	3
or VET 277	Clinical Rotation - Medicine	
VET 280	Kennel Rotation I	1
COM 112	Public Speaking	3
ART ###	Art Elective	3

Semester 4		18
VET 263	Surgical Nursing II	2
VET 267*	Veterinary Radiology	1
VET 268*	Veterinary Radiology Lab	1
VET 269	Intensive Care Applications	3
VET 271	Diseases & Zoonoses	3
VET 275	Clinical Rotation - Surgery	3
or VET 277	Clinical Rotation - Medicine	
VET 282	Kennel Rotation II	1
VET 295	Professional Seminar	1
CSM 105	Customer Service and Our World	3
		18
Summer Semester		
VET 299	Internship	4
Minimum Credits to Graduate		74

* Must be taken concurrently with VET 275 offered in Semester 3 & 4.

The sequence of classes on this page addresses students starting the program in the fall. Students admitted into and beginning their coursework in the spring semester should consult with an Enrollment Specialist and/or the Program Director for further information.

Veterinary Technology Course Descriptions

Course No.	Course Title	Credits
VET 151	Intro. to Veterinary Technology / Clinical Management This course focuses on the duties and responsibilities of veterinary technicians as well as job opportunities in the field of veterinary technology. The human-animal bond and ethical issues are introduced to the student. This course provides students with the basic understanding of operations in a clinical setting in addition to office and managerial duties of technicians such as scheduling, ordering, inventory control, teamwork dynamics, and compassion fatigue. Students may be required to participate in activities of the Johnson College Animal Care Center to gain hands on experience to enhance the course material.	1
VET 153	Clinical Applications for Large Animals The focus of this course is to introduce students to large animals (horses, cattle, small ruminants). Students will learn about restraint and handling of large animals with an emphasis placed on safety. Course material will also include basic nursing care (medicating, physical exams, sample collections, as well as other routine procedures). Students will familiarize themselves with the large animal setting (farms/barns) in addition to tools and techniques found in large animal medicine. This course compliments VET 154, Large Animal Clinical Applications Lab.	2
VET 154	Clinical Applications for Large Animals Lab The focus of this course is to introduce students to large animals (horses and cattle). Students will learn how to safely restrain and handle large animals. Course material will also include basic nursing care (medicating, physical exams, sample collections, etc.). Students will familiarize themselves with the large animal setting (farms/barns) and various tools, equipment and techniques used in large animal medicine. (<i>Co-requisite: VET 153</i>)	1
VET 155	Clinical Applications for Small Animals This course will provide information on skills needed to work in a clinical setting. Emphasis will be on safety, handling & restraint techniques, general patient care and assessment, and medicating small animals. The course will also concentrate on husbandry and care of laboratory animals. <u><i>Companion animal and Lab animal daily rotations are associated with this course requiring weekend and holiday animal rotations. Schedule will be provided.</i></u> This course compliments VET 156, Small Animal Clinical Applications Lab.	2
VET 156	Clinical Applications for Small Animals Lab This lab class allows students hands-on experience with various small animal species (<i>small rodents, rabbits, cats & dogs with availability</i>), including handling & restraint, administration of medication, and performing physical exams. Students must provide proof of prophylactic rabies inoculation and tetanus inoculation in order to participate in the lab. <u><i>Companion animal and Lab animal daily rotations are associated with this course requiring weekend and holiday animal rotations. Schedule will be provided.</i></u> (<i>Co-requisite: VET 155</i>)	1

VET 157	Animal Anatomy and Physiology I 3 This course studies microscopic, cellular, and gross (macroscopic) animal anatomy and physiology that are likely to be encountered by the veterinary nurse, including: structure and function of cells, tissues, organs and organ systems. Topics emphasized include: directional terminology, introduction to basic chemical principles for life, cellular anatomy and physiology, and histology. Gross anatomy and physiology of the integument, skeletal system, muscular system, nervous system, and sense organs will be covered, emphasizing canine and feline bodies, while noting pertinent species' differences along the way. This course compliments VET 158, Animal Anatomy and Physiology Lab.
VET 158	Animal Anatomy and Physiology Lab I 1 Topics covered in this course in a hands-on fashion include anatomic directions and terminology, chemical principles for life, cellular anatomy, cellular physiology, principles of histology, and organ systems. The systems covered here include the integument and related structures, the skeletal system, the muscular system, the nervous system, and special sense organs. Models and preserved specimens will be utilized, as well as a supplementary virtual anatomy tool. In addition, the student will be introduced to the proper use and care of a microscope. Personal protective equipment (PPE)/laboratory safety are covered. This course compliments and reinforces material presented in VET 157, Animal Anatomy and Physiology I.
VET 159	Animal Anatomy and Physiology II 3 This course is a continued study of anatomical and physiological systems of animals that are likely to be encountered by the veterinary nurse. Emphasis is placed on the canine and feline body, however, some specific species' differences are noted along the way. Proper terminology is utilized to describe the major organs of each system, their locations, functions and pertinent histology. This course will cover the following systems: endocrine, blood, lymphatics, immunity and defense mechanisms, cardiovascular, respiratory, gastrointestinal (including dentition), urinary, and reproductive. This course compliments VET 160, Animal Anatomy and Physiology. (<i>Prerequisites:</i> VET 151, VET 157, VET 158)
VET 160	Animal Anatomy and Physiology Lab II 1 Topics covered in this course in a hands-on fashion include the following: endocrine system, blood, lymphatic system, immune system, cardiovascular system, respiratory system, gastrointestinal tract (including dentition), urinary tract, and reproductive tract. Models and preserved specimens will be utilized, as well as a supplementary virtual anatomy tool. Emphasis will be placed on feline and canine bodies, with pertinent species' differences noted along the way. This course compliments and reinforces material presented in VET 159, Animal Anatomy and Physiology II. (<i>Prerequisites:</i> VET151, VET 157, VET 158)
VET 161	Parasitology & Immunology 2 This course will provide a foundation of microbiology, immunology, and parasitology for veterinary technicians. This course will cover characteristics of bacteria, fungi, viruses, and parasites, including emphasis on specific disease causing organisms, diagnosis, treatment, and prevention. In addition, this course will introduce some basic concepts of humoral and cellular immunity, emphasizing uses in laboratory diagnostics and vaccines. This course compliments VET 162, Parasitology & Immunology Lab. (<i>Prerequisites:</i> VET 151, VET 157, VET 158)

VET 162	Parasitology & Immunology Lab 1 This course involves identification of parasites, bacteria, viruses, and fungi common to veterinary medicine. Students will practice sample collection and preparation for parasitological and microbiological examination. Sample collection, handling, preparation & precautions are stressed. This course compliments VET 161, Parasitology & Immunology. (<i>Prerequisites:</i> VET 151, VET 157, VET 158; <i>Co-requisite:</i> VET 161)
VET 251	Pharmacology & Anesthesia 3 This course is the study of the theory and application of pharmacology. Classifications of drugs and their usage, with specific information on mechanism of action, side effects, and dosing will be discussed. Students will be exposed to drug calculations and be expected to prepare and administer medications. This course covers dispensing medication and client instruction on how to give medications as well as educate clients on adverse reactions to medications. (<i>Prerequisites:</i> VET 151, VET 153, VET 155, VET 157, VET 159, VET 161, CHM 101, CHM 102, MAT 205)
VET 253	Clinical Pathology 2 This course is designed to familiarize the student with diagnostic laboratory procedures commonly performed in the veterinary field. Discussions include clinical chemistry, veterinary hematology, urology and cytology. Sample collection and handling along with instrumentation and equipment maintenance is discussed. This course compliments VET 254, Clinical Pathology Lab. (<i>Prerequisites:</i> VET 151, VET 157, VET 158, VET 159, VET 160)
VET 254	Clinical Pathology Lab 1 This lab is designed to enhance and reinforce lecture and/or demonstrations by allowing students the opportunity to practice a variety of laboratory tests common to veterinary medicine. Students will perform hematological analyses, clinical chemistries, and urinalysis in addition to ear and skin cytology. (<i>Prerequisites:</i> VET 151, VET 153, VET 155, VET 157, VET 158, VET 159, VET 160; <i>Co-requisite:</i> VET 254)
VET 259	Surgical Nursing I 2 This course focuses on anesthesia principles and practices and standard surgical procedures. This course covers the role of a surgical technician in regards to preoperative procedures, prepping, scrubbing, assisting, and post-operative procedures, as well as client education/communication. (<i>Prerequisites:</i> VET 153, VET 154, VET 155, VET 156, VET 159, VET 160)
VET 263	Surgical Nursing II 2 Dental procedures will be a focus of this course. Additionally, this course focuses on surgical procedures (spays and neuters as well as other common surgeries of both small and large animals) as well as ECG application and interpretation for patient monitoring. The course places special emphasis on pain management, wound management, physical therapy and other nursing care duties and responsibilities of technicians. (<i>Prerequisite:</i> VET 259)
VET 267	Veterinary Radiology 1 This course is a study of radiological procedures for domestic animals common to veterinary medicine. It includes an overview of radiographic properties and

equipment, restraint and positioning techniques, as well as exposing, developing and assessing radiographs. Record keeping and safety issues are discussed in addition to specialized radiographic studies. Students are provided hands-on opportunity to practice the techniques learned in class. This course compliments VET 268, Veterinary Radiology Lab. (*Prerequisites:* VET 151, VET 153, VET 154, VET 155, VET 156, VET 159, VET 160)

- VET 268 Veterinary Radiology Lab 1**
 This course provides a hands-on study of radiological procedures for domestic animals common to veterinary medicine. It encourages the practice of how to work with radiographic properties and equipment, restraint and positioning techniques, as well as exposing, developing and assessing radiographs. Appropriate record keeping and safety issues are reviewed in addition to specialized radiographic studies. Students are provided hands-on opportunity to practice the techniques learned in lecture. This course compliments VET 267, Veterinary Radiology Lab (*Prerequisites:* VET 151, VET 153, VET 154, VET 155, VET 156, VET 159, VET 160; *Co-requisite:* VET 267)
- VET 269 Intensive Care Applications 3**
 This course is a study of the technician's role in emergency and intensive care. Students will study fluid therapy, blood transfusion, CPR and other procedures associated with emergency and critical care protocols. Students will be required to complete an online CPR certification. This course may also include 8 hours of exposure to emergencies in an emergency facility. (*Prerequisites:* VET 151, VET 153, VET 154, VET 155, VET 156, VET 159, VET 160, VET 161, VET 162, VET 253, VET 254, VET 259)
- VET 271 Diseases and Zoonoses 3**
 This course is primarily the study of diseases (infectious, contagious, zoonotic, inflammatory, and organ system) and toxicology. Species studied include canine/feline, bovine/equine, porcine, small ruminant and select exotic species such as birds, ferrets, rabbits and reptiles. Topics such as the etiology, clinical signs, diagnostic tools, prevention techniques, treatments and public health issues for particular diseases are presented. A study of vaccine protocols for each species is also included where applicable. (*Prerequisites:* VET 151, VET 153, VET 154, VET 155, VET 156, VET 159, VET 160, VET 161, VET 162, VET 251)
- VET 275 Clinical Rotation - Surgery 3**
 Each student will be assigned to specific areas within the Animal Care Center. Areas will include treatment, lab, kennel, and surgery, as well as other areas within the facility. Students will work alongside a licensed technician to hone skills learned in lecture and in labs. NOTE: successful completion of this course requires a 76% or better score on the written final exam, oral/practical exam, and instructor evaluations' of students. (*Prerequisite:* Students must have successfully completed all first year courses)
- VET 277 Clinical Rotation - Medicine 3**
 Each student will be assigned to specific areas within the Johnson College Animal Care Center. Areas will include radiology, lab, kennel, reception, pharmacy, and examination rooms, as well as other areas within the facility. Students will work alongside a licensed technician to hone skills learned in lecture and in labs. NOTE:

successful completion of this course requires a 76% or better score on the written final exam, oral/practical exam, and instructor evaluations' of students.

(Prerequisite: Students must have successfully completed all first year courses)

- VET 280 Surgical Kennel Rotation 1**
This course focuses on preventive medicine and husbandry of canine and feline species. Topics covered include husbandry, applied anatomy, physical exams, applied parasitology, vaccine protocols, and preventive care. Emphasis is placed on individualizing patient care for surgical pre-op & post-op patients. *Kennel rotations are associated with this course requiring weekday and weekend rotation times.*
(Prerequisites: VET 151, VET 155, VET 156, VET 159)
- VET 282 Medical Kennel Rotation 1**
This course focuses on preventive medicine and husbandry of canine and feline species. Topics covered include husbandry, applied anatomy, physical exams, applied parasitology, vaccine protocols, and preventive care. Emphasis is placed on individualizing patient care for medical and boarding patients. *Kennel rotations are associated with this course requiring weekday and weekend rotation times.*
(Prerequisites: VET 151, VET 155, VET 156, VET 159)
- VET 295 Professional Seminar 1**
This 1 credit course is a capstone of the Veterinary Technology program. The course will focus on preparing the student to sit for the VTNE licensing exam by concentrating on material from the nine (9) practice domains on the exam. The course will also provide information & skills necessary to participate in the internship/co-op requirement and CV writing. Students will be challenged utilizing case-based scenarios and complete multiple VTNE style practice exams in preparation for the VTNE. (Prerequisite: Must have successfully completed all 1st through 3rd semester courses. Must be taken the final semester prior to internships.)
- VET 299 Internship 4**
This work experience is designed to expose the students to an actual clinical environment. Students go into a contracted facility after they have met all program requirements. The students are expected to adhere to all policies and regulations associated with their work-term facility. This work experience is intended to expound upon the students' knowledge, skill and aptitude as an entry-level technician. Students will be expected to purchase a minimum of 2 full sets of Johnson College scrubs. A uniform fitting is scheduled prior to the internship. (Prerequisites: Must have successfully completed all VET 1st and 2nd year courses).

Transportation Division -

Automotive Technology (AAS)

Program Objective

The Automotive Technology program prepares students as entry-level technicians in the automobile and diesel industries.

Career Opportunities

Graduates can work for employers in the automotive career fields of automotive, truck, farm and earthmoving equipment dealerships; truck, power generation and construction companies; automotive service centers; engine repair/machine shops; automotive equipment distributors; independent service garages; automotive parts manufacturers; sales representation; and auto insurance companies. Graduates may work with brake systems, transmissions, alignments and repairs; be representatives in claim, sales and service, or become truck/fleet maintenance technicians.

Program Learning Goals

Goal 1: Graduates will possess the appropriate skills needed for entering the Automotive Technology field.

Student Learning Outcomes - Students will:

- Identify tools necessary to perform job duties
- Demonstrate ability to perform basic automobile services
- Practice Safe work habits for all jobs performed

Goal 2: Graduates will understand the importance of professional behavior, as well as comply with the daily changes within the Automotive Industry and will meet the challenges of continued growth within the Automotive Technology Profession.

Student Learning Outcomes - Students will:

- Interpret basic repair instructions
- Follow diagnostic flow charts to properly diagnose problems
- Take basic skills to the next level with on the job training

Goal 3: Graduates will be provided the skills that will allow them to choose careers in the field.

Student Learning Outcomes - Students:

- Can become electrical systems specialists
- Will be able to recognize importance of customer satisfaction
- Can use their automotive knowledge to become Parts Specialists

Automotive Technology Major Courses

AUT 153	Brake Systems	1
AUT 154	Brake Systems Lab	2
AUT 155	Steering and Suspension Systems	1
AUT 156	Steering and Suspension Systems Lab	2
AUT 157	Introduction to Welding for Automotive Students	2
AUT 159	Electrical & Electronic Systems	1
AUT 160	Electrical & Electronic Systems Lab	2
VMR 151	Introduction to Vehicle Maintenance & Repair Technology	2
AUT 253	Certifications for Automotive Students	2
AUT 161	Engine Performance & Emissions	1
AUT 162	Engine Performance & Emissions Lab	2
AUT 163	Internal Combustion Engine Fundamentals	1
AUT 164	Internal Combustion Engine Fundamentals Lab	2
AUT 261	Gasoline Engine Overhaul Procedures	2
AUT 262	Gasoline Engine Overhaul Procedures Lab	2
AUT 263	Advanced Automotive Electrical Technology	1
AUT 264	Advanced Automotive Electrical Technology Lab	2
AUT 265	Automatic Transmissions & Transaxles	1
AUT 266	Automatic Transmissions & Transaxles Lab	2
AUT 267	Manual Transmissions & Differentials	1
AUT 268	Manual Transmissions & Differentials Lab	2
AUT 269	Applied Automotive Principles and Applications	2
AUT 270	Applied Automotive Principles Applications and Lab	2
or INT 299	Internship	4
DAS 201	Driver Assistance Systems	2
VMR 251	HVAC Vehicle Systems	2
VMR 252	HVAC Vehicle Systems Lab	1
Core Career Courses		
BUS 101	Introduction to Business	3
COM 112	Public Speaking	3
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
Or MAT105	Math for the Transportation Division	
ART ###	Art Elective	3
SCI ###	Science Elective	3
SSS 101	First-Year Experience	1
Minimum Credits to Graduate		65

Automotive Technology
Associate in Applied Science (AAS)
Semester Program Outline

Semester 1		Credits
VMR 151	Introduction to Vehicle Maintenance & Repair Technology	2
AUT 153	Brake Systems	1
AUT 154	Brake Systems Lab	2
AUT 155	Steering and Suspension Systems	1
AUT 156	Steering and Suspension Systems Lab	2
AUT 157	Introduction to Welding for Automotive Students	2
CPT 101	Microcomputer I	3
SSS 101	First-year Experience	1
		14
Semester 2		
AUT 159	Electrical & Electronic Systems	1
AUT 160	Electrical & Electronic Systems Lab	2
AUT 161	Engine Performance & Emissions	1
AUT 162	Engine Performance & Emissions Lab	2
AUT 163	Internal Combustion Engine Fundamentals	1
AUT 164	Internal Combustion Engine Fundamentals/Lab	2
BUS 101	Introduction to Business	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 101	College Algebra I and Trigonometry	3
Or MAT105	Math for the Transportation Division	
		18
Semester 3		
AUT 261	Gasoline Engine Overhaul Procedures	2
AUT 262	Gasoline Engine Overhaul Procedures Lab	2
AUT 263	Advanced Automotive Electrical Technology	1
AUT 264	Advanced Automotive Electrical Technology Lab	2
AUT 265	Automatic Transmissions & Transaxles	1
AUT 266	Automatic Transmissions & Transaxles Lab	2
COM 112	Public Speaking	3
ART ###	Art Elective	3
		16
Semester 4		
DAS 201	Driver Assistance Systems	2
VMR 251	HVAC Vehicle Systems	2
VMR 252	HVAC Vehicle Systems Lab	1
AUT 253	Certifications for Automotive Students	2
AUT 267	Manual Transmissions & Differentials	1
AUT 268	Manual Transmissions & Differentials Lab	2
AUT 269	Applied Automotive Principles and Applications	2
AUT 270	Applied Automotive Principles and Applications Lab	2
or INT 299	Internship	4
SCI ###	Science Elective	3
		17
Minimum Credits to Graduate		65

Automotive Technology Course Descriptions

Course No.	Course Title	Credits
AUT 153	Brake Systems This course covers information on hydraulic brake systems. Mechanical foundation, service brake system principles, major components, parking brake systems, brake system diagnostics, service to drum brake assemblies, hydraulic lines and hoses, brake switches, antilock brake principles and service are all a part of this course. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. This will prepare students to take the ASE technician certification test. (Co-requisite: AUT 154)	1
AUT 154	Brake Systems Lab This lab covers service practice procedures on hydraulic brake systems. Competency tasks will be performed on mechanical foundation, service brake system principles, major component diagnosis and repair, parking brake systems, brake system diagnostics, service to drum brake assemblies, hydraulic lines and hoses, brake switches, antilock brake principles and service are all a part of this course. High priority tasks recommended by ASE (Automotive Service Excellence) are practiced and performed to industry standards. This lab will prepare students to take the ASE technician certification test in brake systems. (Co-requisite: AUT 153)	2
AUT 155	Steering and Suspension Systems This course covers information on steering and suspension systems, theory and principles, independent suspensions, geometric principles, factors affecting wheel alignment, tools and equipment used for steering and suspension, troubleshooting of suspension and steering, wheel bearings service, manual steering and power steering system operation. This lecture on theory will prepare students to take the ASE technician certification test for steering and suspension systems. (Co-requisite: AUT 156)	1
AUT 156	Steering and Suspension Systems Lab This lab covers service practice procedures on steering and suspension systems. Students will utilize the theory learned in VMR 155 to diagnose steering and suspension issues and the effect on wheel alignment. Students will perform competency tasks with the tools and equipment used for steering and suspension adjustment and repair, troubleshooting of suspension and steering, wheel bearings service, manual steering and power steering systems. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. This will prepare students to take the ASE technician certification test for steering & suspension systems. (Co-requisite: AUT 155)	2
AUT 157	Introduction to Welding for Auto Students This course is designed to introduce students to the basic principles and practices of several different types of welding. Students will learn the principles and safety issues related to Gas welding and cutting, MIG welding, Stick welding, Flux Core welding and TIG welding. Students will have the opportunity to practice the techniques used	2

with all types of welding. This course will prepare students to perform welding tasks and minor fabrication tasks when they are in the industry setting.

- AUT 159 Electrical & Electronic Systems 1**
This course covers information on electricity, basic electrical circuits, tools and equipment, batteries, charging systems, starting systems, lighting systems, horn, wipers and washers, cooling fans, instrument circuits and body electrical systems. This will prepare students to take the ASE technician certification test for electrical systems. (*Co-requisite:* AUT 160)
- AUT 160 Electrical & Electronic Systems Lab 2**
This lab covers competency tasks on basic electrical circuits, practical use of tools and equipment used to diagnose batteries, charging systems, starting systems, lighting systems, horn, wipers and washers, cooling fans, instrument circuits and body electrical systems. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. This will prepare students to take the ASE technician certification test for electrical systems. (*Co-requisite:* AUT 159)
- AUT 161 Engine Performance & Emissions 1**
This course covers information theory on the operation and approved servicing of emission systems, fuel injection systems, computerized emission control systems, computerized engine procedures. Computer diagnostics is introduced, including closed-loop theory, closed-loop diagnostics; basic troubleshooting and scan tool operation is also covered. Proper safety procedure related to fuel and emission systems is also covered. This will prepare students to take the ASE technician certification test for engine performance. (*Co-requisite:* AUT 162)
- AUT 162 Engine Performance & Emissions Lab 2**
This lab provides practical experience on the operation and approved servicing of emission systems, fuel injection systems, computerized emission control systems, computerized engine procedures and utilizes live vehicles to reinforce the information presented. Students will perform competency tasks utilizing diagnostic equipment and proper safety procedures related to fuel and emission systems diagnostics and repair. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. This will prepare students to take the ASE technician certification test for engine performance.
(*Co-requisite:* AUT 161)
- AUT 163 Internal Combustion Engine Fundamentals 1**
This course covers the theory on the operation and approved servicing of engine cooling systems and lubrication systems. The four- and two-stroke engine configurations are addressed along with various camshaft configurations. Proper safety procedures related to the diagnosis and repair of the internal combustion engine are also covered. This will prepare students to take the ASE technician certification test for engine diagnostics and overhaul. (*Co-requisite:* AUT 164)
- AUT 164 Internal Combustion Engine Fundamentals Lab 2**
This lab consists of practical experience on the operation and approved servicing of engine cooling systems and lubrication systems. Proper safety procedures related to the diagnosis and repair of the internal combustion engine are covered. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. This will

prepare students to take the ASE technician certification test engine diagnostics and overhaul. (*Co-requisite:* AUT 163)

- AUT 253 Certifications for Automotive Students 2**
This course is designed to provide necessary training and practical testing to assist students in obtaining certifications for PA Safety Inspector, PA Emissions Inspector, and ASE Entry Level certification possibilities in all 8 categories of ASE training. These certifications will provide students with credentials that employers in the transportation industry are seeking.
- AUT 261 Gasoline Engine Overhaul Procedures 1**
Information and theory is provided for engine overhaul procedures. Emphasis is placed on the repair of cylinder heads, valve trains, and engine blocks. Proper safety procedures related to engine overhaul are covered. Proper diagnostics will be stressed as well as component inspection, measuring and testing. This will prepare students to take the ASE technician certification test engine diagnostics and overhaul.
(*Prerequisite:* AUT 163, AUT 164; *Co-requisite:* AUT 262)
- AUT 262 Gasoline Engine Overhaul Procedures Lab 2**
This lab contains competency tasks for engine overhaul procedures. Emphasis is placed on properly diagnosing, inspecting and measuring component of cylinder heads, valve trains, and engine blocks. Proper safety procedures related to engine overhaul will also be practiced while performing live work. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. This will prepare students to take the ASE technician certification test engine diagnostics and overhaul. (*Prerequisite:* AUT 163, AUT 164; *Co-requisite:* AUT 261)
- AUT 263 Advanced Automotive Electrical Technology 1**
This course will further reinforce theories and principles of automotive electronics through the use of diagnostic equipment for practical troubleshooting scenarios. Students will learn advanced techniques of wiring diagram reading. Students will be able to follow electrical flow through a circuit on a vehicle wiring diagram. Proper safety procedures related to electrical troubleshooting will also be discussed.
(*Prerequisite:* VMR 159, VMR 160; *Co-requisite:* AUT 264)
- AUT 264 Advanced Automotive Electrical Technology Lab 2**
This lab will consist of problem scenarios created by the instructor. Students will perform specific tasks using the diagnostic equipment covered in the lecture portion of this course. Shop experiments will be performed to trace and repair electrical issues with the use of wiring diagrams. Students will use their ability to follow electrical flow through a circuit on a vehicle wiring diagram to diagnose and repair wiring defects. Proper safety procedures related to electrical troubleshooting will also be practiced. High priority tasks recommended by ASE (Automotive Service Excellence) are completed as competency exercises. This will prepare students to take the ASE technician certification test for electrical and electronics. (*Prerequisite:* VMR 159, VMR 160; *Co-requisite:* AUT 263)
- AUT 265 Automatic Transmissions and Transaxles 1**
This course covers the information and theory necessary to service automatic transmissions. Systematic troubleshooting procedures, adjustments and unit overhaul are discussed in this course. Students will learn how to find information on repairing

and troubleshooting the modern electronically controlled automatic transmissions. This will prepare students to take the ASE technician certification test for automatic transmissions. (*Co-requisite*: AUT 266)

- AUT 266 Automatic Transmissions and Transaxles Lab 2**
This lab contains practical competency tasks that students will perform to hone their skills diagnosing and servicing automatic transmissions. Systematic troubleshooting procedures, adjustments and unit disassembly and assembly are part of this program. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. This will prepare students to take the ASE technician certification test for automatic transmissions. (*Co-requisite*: AUT 265)
- AUT 267 Manual Transmissions and Differentials 1**
This course covers the theory and service procedure on complete power-train systems for front-, rear-, and four-wheel drive vehicles. Students will be taught the theory and mechanics of manual transmissions, drive axles and final drives. The students will utilize the theory of operation to help with diagnosing defective drive line components. Proper safety procedures related to manual transmissions and differentials will be discussed. This will prepare students to take the ASE technician certification test manual transmissions and drive axles. (*Co-requisite*: AUT 268)
- AUT 268 Manual Transmissions and Differentials Lab 2**
This lab includes disassembly and assembly of components of complete power-train systems for front-, rear-, and four-wheel drive vehicles. New learning experiences include inspection, replacement, servicing, and rebuilding procedures and proper diagnostics of manual transmissions, transaxles, and locking hubs. In addition, servicing, troubleshooting and overhaul procedures for 4-wheel drive differentials and drive differentials and drive shafts will be practiced. Proper safety procedures related to manual transmissions and differentials will also be used when performing tasks and live work. High priority competency tasks recommended by ASE (Automotive Service Excellence) are performed and assessed. This will prepare students to take the ASE technician certification test for manual transmissions and drive axles. (*Co-requisite*: AUT 267)
- AUT 269 Applied Automotive Principles and Applications 2**
This course is intended to re-examine and emphasize specific mechanical knowledge and diagnostic experience and to apply that to principles and theories learned in previous courses. Students are expected to hone the specific skills to prepare them for entry-level positions upon graduation. This will prepare students to take the ASE technician certification test.
- AUT 270 Applied Diesel Automotive Principles and Applications Lab 2**
This lab is intended to re-examine and emphasize specific mechanical skills and diagnostic techniques and to apply them to principles and theories learned in previous courses. Students are expected to hone the specific skills by performing competency tasks to industry standards. Doing this will prepare students for entry-level positions upon graduation. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. This will prepare students to take the ASE technician certification test.

DAS 201	Driver Assistance Systems 2 This course will provide the student with critical information on modern day Driver Assistance Systems. These systems include Adaptive Cruise Control, Forward Collision Warning, Collision Mitigation Braking, Lane Departure Warning, Lane Keeping Assistance, Lane Watch Blind Spot System, Rain Sensing Wipers, Rear View Camera and Cross Traffic Alert systems, Reverse Automatic Braking (Subaru), Steering Responsive Headlights, Auto High Beams, Android Auto & Apple CarPlay Smart Phone integration, Enhanced Active Park Assist, Traffic Sign Recognition, and Front and Rear Park Assist to name a few. Learning these systems will prepare students to recognize these systems and how they work. Students will be up to date with the latest technology in modern automobiles. (<i>prerequisites</i> VMR 159, VMR 160, AUT 263, AUT 264)
VMR 151	Introduction to Vehicle Maintenance & Repair Technology 2 This course covers information on hand tools, machines, and equipment common to the vehicle maintenance field, general service procedures, lubricants, reference manuals, pre-delivery inspection of new and used vehicles and preventive maintenance procedures. This course is designed to prepare students to work properly with all of the for mentioned topics along with building safe and thorough work habits.
VMR 251	HVAC Vehicle Systems 1 This course covers information on the operation of heating and air conditioning as applied to today's cars and trucks. Students will learn the theory of air conditioning systems in passenger vehicles and light trucks, heavy-duty trucks and trailer refrigeration systems. New learning experiences in the troubleshooting and servicing of these systems are taught. This will prepare students to take the ASE technician certification test for HVAC systems. (<i>Co-requisite:</i> VMR 252). Students will receive Mobile Air Conditioning refrigerant recovery and handling, Act 609, certification in this course
VMR 252	HVAC Vehicle Systems Lab 2 This lab covers competency tasks on the operation of heating and air conditioning systems. Students will utilize modern service equipment to perform competencies for recovering, recycling and recharging refrigerant in HVAC systems. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. This will prepare students to take the ASE technician certification test for HVAC systems. (<i>Co-requisite:</i> VMR 251)

Transportation Division –

Aviation Technology

Program Objective

The Aviation Technology program prepares students as entry-level technicians with the latest information on diagnosis, repair procedures, preventive maintenance, and necessary safety applications in aviation technology. The Aviation Technology program provides students the knowledge and skills outlined in the Federal Aviation Administration's (FAA) Mechanics Airman Certification Standard (ACS). The program prepares students to take the FAA licensure exam for general, airframe, and powerplant knowledge. Students will diagnose, adjust, repair, and overhaul aircraft engines and assemblies, landing gear systems, and electrical systems.

Career Opportunities

Graduates of the program typically find jobs as aircraft maintenance technicians, aircraft mechanics, aircraft restorers, airframe and powerplant mechanics (A&P Mechanics), or helicopter mechanics. Graduates can work in general aviation or manufacturing of aircraft components, for a commercial airline, aircraft manufacturer, private company, museum or historical restoration company, or as an entrepreneur.

Program Learning Goals

Goal 1: Graduates will possess the appropriate skills and safety awareness necessary for entry-level employment in the aviation maintenance field.

Student Learning Outcomes - Students will:

- Practice safety in all aspects of classroom, lab, and field experiences.
- Read and interpret maintenance manuals, service bulletins, and other specifications to determine the feasibility and method of repairing or replacing malfunctioning or damaged components.
- Maintain repair logs, documenting all preventive and corrective aircraft maintenance.
- Modify aircraft structures, space vehicles, systems, or components, following drawings, schematics, charts, engineering orders, and technical publications.
- Maintain, repair, and rebuild aircraft structures, functional components, and parts, such as wings and fuselage, rigging, hydraulic units, oxygen systems, fuel systems, electrical systems, gaskets, or seals.
- Examine and inspect aircraft components, including landing gear, hydraulic systems, and deicers to locate cracks, breaks, leaks, or other problems.
- Use critical thinking skills to troubleshoot mechanical and electrical problems associated with various aircraft.

Goal 2: Graduates will gain an understanding of the requirements and responsibilities of being a certificated Federal Aviation Administration's Airframe & Powerplant Mechanic

Student Learning Outcomes - Students will:

- Communicate with managers, supervisors, or company owners in a professional and technical manner.
- Demonstrate timely arrival and readiness for work.
- Demonstrate legal and ethical personal and professional behavior.

Goal 3: Graduates will gain the knowledge and skills outlined in the Federal Aviation Administration's Airman Certification Standards required to become a FAA-Certificated Airframe & Powerplant Mechanic.

Student Learning Outcomes - Students will:

- Successfully complete required coursework to challenge the Federal Aviation Administration licensure written, oral, and practical skills exams.
- Challenge all attempted Federal Aviation Administration licensure exams within 60 days of graduation.
- Pass all attempted Federal Aviation Administration licensure exams within 12 months of graduation.

Aviation Technology Major Courses

AVT 104	Weight & Balance Lab	1
AVT 105	Aircraft Materials, Hardware & Processes	1
AVT 106	Aircraft Materials Lab	2
AVT 107	Regulations, Inspection Techniques & Forms	2
AVT 108	Aircraft Regulations Lab	2
AVT 110	Aircraft Physics & Math Lab	1
AVT 211	Aircraft Metallic Structures	2
AVT 212	Aircraft Metallic Structures Lab	2
AVT 213	Aircraft Non-Metallic Structures	1
AVT 214	Aircraft Non-Metallic Structures Lab	1
AVT 215	Aircraft Controls, Airframe Inspection & Systems	1
AVT 216	Aircraft Controls, Airframe Inspection & Systems Lab	2
AVT 217	Airframe Environmental, Instrument lighting & Water Systems	2
AVT 218	Airframe Environmental, Instrument lighting & Water Systems Lab	2
AVT 219	Airframe Fuel, Electrical, Ice & Fire Control Systems	2
AVT 220	Airframe Fuel, Electrical, Ice & Fire Control Systems Lab	3
AVT 221	Aircraft Reciprocating Engines	3
AVT 222	Aircraft Reciprocating Engines Lab	3
AVT 223	Aircraft Turbine Engines	3
AVT 224	Aircraft Turbine Engines Lab	3
AVT 225	Aircraft Engine, Fire Protection & Electrical Systems	2
AVT 226	Aircraft Engine, Fire Protection & Electrical Systems Lab	3
AVT 227	Aircraft Engine Lubrication, Ignition & Starting, Induction & Fuel Systems	2
AVT 228	Aircraft Engine Lubrication, Ignition & Starting, Induction & Fuel Systems Lab	3
AVT 229	Aircraft Engine Air, Exhaust & Reverser Systems	2
AVT 230	Aircraft Engine Air, Exhaust & Reverser Systems Lab	2
AVT 231	Aircraft Propellers	1
AVT 232	Aircraft Propellers Lab	1

Core Career Courses

AVT 101	Fundamentals of Electricity & Electronics	3
AVT 102	Electronics Lab	2
ART 127	Computer Aided Design	3
MAT 101	College Algebra I & Trigonometry	3
ENG 105	Industry Communication	3
CSM 105	Customer Service in Our World	3
BUS 101	Introduction to Business	3
SSS 101	First-Year Experience	1

Minimum Credits to Graduate

76

Aviation Technology
Associate in Applied Science (AA)
Semester Program Outline

Semester 1		Credits
AVT 101	Fundamentals of Electricity & Electronics	3
AVT 102	Electronics Lab	2
AVT 104	Weight & Balance Lab	1
AVT 105	Aircraft Materials, Hardware & Processes	1
AVT 106	Aircraft Materials Lab	2
ART 127	Computer Aided Design	3
MAT 101	College Algebra I & Trigonometry	3
SSS 101	First-Year Experience	1
		16
Semester 2		
AVT 107	Regulations, Inspection Techniques & Forms	2
AVT 108	Aircraft Regulations Lab	2
AVT 110	Aircraft Physics & Math Lab	1
AVT 211	Aircraft Metallic Structures	2
AVT 212	Aircraft Metallic Structures Lab	2
AVT 213	Aircraft Non-Metallic Structures	1
AVT 214	Aircraft Non-Metallic Structures Lab	1
AVT 215	Aircraft Controls, Airframe Inspection & Systems	1
AVT 216	Aircraft Controls, Airframe Inspection & Systems Lab	2
ENG 105	Industry Communication	3
		17
Summer		
AVT 217	Airframe Environmental, Instrument lighting & Water Systems	2
AVT 218	Airframe Environmental, Instrument lighting & Water Systems Lab	2
CSM 105	Customer Service in Our World	3
		7
Semester 3		
AVT 219	Airframe Fuel, Electrical, Ice & Fire Control Systems	2
AVT 220	Airframe Fuel, Electrical, Ice & Fire Control Systems Lab	3
AVT 221	Aircraft Reciprocating Engines	3
AVT 222	Aircraft Reciprocating Engines Lab	3
AVT 223	Aircraft Turbine Engines	3
AVT 224	Aircraft Turbine Engines Lab	3
		17

Semester 4

AVT 225	Aircraft Engine, Fire Protection & Electrical Systems	2
AVT 226	Aircraft Engine, Fire Protection & Electrical Systems Lab	3
AVT 227	Aircraft Engine Lubrication, Ignition & Starting, Induction & Fuel Systems	2
AVT 228	Aircraft Engine Lubrication, Ignition & Starting, Induction & Fuel Systems Lab	3
AVT 229	Aircraft Engine Air, Exhaust & Reverser Systems	2
AVT 230	Aircraft Engine Air, Exhaust & Reverser Systems Lab	2
AVT 231	Aircraft Propellers	1
AVT 232	Aircraft Propellers Lab	1
BUS 101	Introduction to Business	3
		19
Minimum Credits to Graduate		76

Aviation Technology Course Descriptions

Course No.	Course Title	Credits
AVT 101	Fundamentals of Electricity and Electronics 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. The General curriculum subject included in this course and required by FAA-S-ACS-1 is General Subject A. Fundamentals of Electricity and Electronics; Sections AM.I.A.K1 thru AM.I.A.K27. (<i>Co-requisite:</i> AVT 102)	3
AVT 102	Electronics Lab This laboratory course incorporates the skills needed to apply information presented in AVT 101. 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. The General curriculum subject included in this course and required by FAA-S-ACS-1 is General Subject A. Fundamentals of Electricity and Electronics; Sections AM.I.A.R1 thru AM.I.A.R4 and AM.I.A.S1 thru AM.I.A.S14. (<i>Co-requisite:</i> AVT 102)	2
AVT 104	Weight and Balance Lab This laboratory course introduces the student to the fundamental principles of aircraft weight and balance. Topics include terminology, procedures, calculations and record keeping for preparing the weight and balance of an aircraft. The General curriculum subjects included in this course and required by FAA-S-ACS-1 is General Subject B- Aircraft Drawings & C- Weight and Balance; Sections AM.I.B.K1 thru AM.I.B.K4, AM.I.B.R1 thru AM.I.B.R4, AM.I.B.S1 thru AM.I.B.S6 AM.I.C.K1 thru AM.I.C.K10, AM.I.C.R1 thru AM.I.C.R5 and AM.I.C.S1 thru AM.I.C.S17. (<i>Co-requisite:</i> ART 107)	1
AVT 105	Aircraft Materials, Hardware & Processes This course introduces the student to the materials used in aircraft and how to identify them, including types of fasteners typically used. Additionally, the processes that keep	1

all equipment in usable condition will be explored. The General curriculum subjects included in this course and required by FAA-S-ACS-1 are General Subjects D -Fluid Lines and Fittings, E-Aircraft Materials, Hardware & Processes, and G-Cleaning and Corrosion Control; Sections AM.I.D.K1 thru AM.I.D.K6, AM.I.E.K1 thru AM.I.E.K14 and AM.I.G.K1 thru AM.I.G.K24. (*Co-requisite*: AVT 106)

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| AVT 106 | <p>Aircraft Materials Lab 2</p> <p>This laboratory course incorporates the skills needed to apply information presented in AVT 105 and introduces the student to the materials used in aircraft and how to identify them, including types of fasteners typically used. Additionally, the processes that keep all equipment in usable condition will be explored. The General curriculum subjects included in this course and required by FAA-S-ACS-1 are General Subjects D -Fluid Lines and Fittings, E-Aircraft Materials, Hardware & Processes, and G-Cleaning and Corrosion Control; Sections AM.I.D.R1 thru AM.I.D.R7, AM.I.D.S1 thru AM.I.D.S8, AM.I.E.R1 thru AM.I.E.R4, AM.I.E.S1 thru AM.I.E.S14, AM.I.G.R1 thru AM.I.G.R8, and AM.I.G.S1 thru AM.I.G.S14 (<i>Co-requisite</i>: AVT 105)</p> |
| AVT 107 | <p>Regulations, Inspection Techniques & Forms 2</p> <p>Ground operation and servicing topics covered include shop and flight line safety (fire safety and procedures, jacking safety, hazardous materials procedures, e-down techniques, standard hand signals, and fueling safety and procedures, etc.). Servicing with ground power units, oxygen and other related items used on aircraft are discussed. This course covers a review of regulations, maintenance forms, records and publications along with inspection concepts and techniques and finally human factors. The General curriculum subjects included in this course and required by FAA-SACS-1 are General Subject F-Ground Operations and Servicing, I-Regulations, Maintenance forms, Records, and Publications, K-Inspection Concepts and Techniques, and L-Human Factors; Sections AM.I.F.K1 thru AM.I.F.K16, AM.I.I.K1 thru AM.I.I.K13, AM.I.K1 thru AM.I.K23, AM.I.K1 thru AM.I.K5. (<i>Co-requisite</i>: AVT 108)</p> |
| AVT 108 | <p>Aircraft Regulations Lab 2</p> <p>This laboratory course incorporates the skills needed to apply information presented in AVT 107 with a focus on ground operation and servicing topics covered include shop and flight line safety (fire safety and procedures, jacking safety, hazardous materials procedures, e-down techniques, standard hand signals, and fueling safety and procedures, etc.). Servicing with ground power units, oxygen and other related items used on aircraft are performed, along with towing, taxiing aircraft, and engine starting procedures. The General curriculum subjects included in this course and required by FAA-SACS-1 are General Subject F-Ground Operations and Servicing, I-Regulations, Maintenance forms, Records, and Publications, K-Inspection Concepts and Techniques, and L-Human Factors; Sections AM.I.F.R1 thru AM.I.F.R10, AM.I.F.S1 thru AM.I.F.S12, AM.I.I.R1 thru AM.I.I.R5, AM.I.I.S1 thru AM.I.I.S18, AM.I.K.R1 thru AM.I.K.R5, AM.I.K.S1 thru AM.I.K.S18. AM.I.L.R1 thru AM.I.L.R1 thru AM.I.L.R3, AM.I.L.S1 thru AM.I.L.S3. (<i>Co-requisite</i>: AVT 107)</p> |
| AVT 110 | <p>Aircraft Physics and Math Lab 1</p> <p>This laboratory course instructs students on the math and physics problems encountered by aviation mechanics. Students will perform mathematical calculations through the use of correct methods, procedures, and practice. The General Curriculum</p> |

subjects included in this course and required by FAA-S-ACS-1 are General Subject H-Mathematics, J-Physics for Aviation; Sections AM.I.H.K1 thru AM.I.H.K13, AM.I.H.R1 thru AM.I.H.R3, AM.I.H.S1 thru AM.I.H.S8, AM.I.J.K1 thru AM.I.J.K13, AM.I.J.R1 thru AM.I.J.R4, AM.I.J.S1 thru AM.I.J.S8 (*Prerequisite*: MAT 111)

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| AVT 211 | Aircraft Metallic Structures | 2 |
| | This course introduces students to the various materials and processes used in aircraft fabrication and repair including the uses, strengths, limitations, and other characteristics of structural metals. The Airframe Curriculum subject included in this course and required by FAA-S-ACS-1 is Airframe Subject A-Metallic Structures; Sections AM.II.A.K1 thru AM.II.A.K17. (<i>Co-requisite</i> : AVT 212) | |
| AVT 212 | Aircraft Metallic Structures Lab | 2 |
| | This laboratory course incorporates the skills needed to apply information presented in AVT 211 and provides instruction in basic sheet metal skills including forming, welding, riveting and material selection. The Airframe Curriculum subject included in this course and required by FAA-S-ACS-1 is Airframe Subject A-Metallic Structures; Sections AM.II.A.R1 thru AM.II.A.R5, AM.II.A.S1 thru AM.II.A.S14. (<i>Co-requisite</i> : AVT 211) | |
| AVT 213 | Aircraft Non-Metallic Structures | 1 |
| | This course introduces students to the various materials and processes used in aircraft fabrication and repair including the uses, strengths, limitations, and other characteristics of wood, fiberglass, composite, thermoplastic and fabrics. The Airframe Curriculum subject included in this course and required by FAA-S-ACS-1 is Airframe Subject B-Non-Metallic Structures; Sections AM.II.B.K1 thru AM.II.B.K29. (<i>Co-requisite</i> : AVT 213) | |
| AVT 214 | Aircraft Non-Metallic Structures Lab | 1 |
| | This laboratory course incorporates the skills needed to apply information presented in AVT 213. Students work with the various materials and processes used in aircraft fabrication and repair including the uses, strengths, limitations, and other characteristics of wood, fiberglass, composite, thermoplastic and fabrics. The Airframe Curriculum subject included in this course and required by FAA-S-ACS-1 is Airframe Subject B-Non-Metallic Structures. AVT 113 will cover sections AM.II.B.K1 thru AM.II.B.K29. AVT 114 will cover sections AM.II.B.R1 thru AM.II.A.R7, AM.II.A.S1 thru AM.II.A.S12. (<i>Co-requisite</i> : AVT 214) | |
| AVT 215 | Aircraft Controls, Airframe Inspection and Systems | 1 |
| | This course focuses on the required inspections of aircraft component systems, including cables, tubes and components associated with aircraft control. The required knowledge of rotorcraft including flight controls, ground handling and rigging is also included. The Airframe Curriculum subjects included in this course and required by FAA-S-ACS-1 are Airframe Subject C-Flight Controls, D-Airframe Inspection, E-Landing Gear Systems, F-Hydraulic and Pneumatic Systems and N-Rotorcraft Fundamentals; Sections AM.II.C.K1 thru AM.II.C.K13, AM.II.D.K1 thru AM.II.D.K9, AM.II.E.K1 thru AM.II.E.K13, AM.II.F.K1 thru AM.II.F.K11 and AM.II.N.K1 thru AM.II.N.K9. (<i>Co-requisite</i> : AVT 216) | |

- AVT 216 Aircraft Controls, Airframe Inspection and Systems Lab 2**
 This laboratory course incorporates the skills needed to apply information presented in AVT 215 and focuses on the required inspections of aircraft component systems, including cables, tubes and components associated with aircraft control. The required skills for rotorcraft including flight controls, ground handling and rigging is also included. The Airframe Curriculum subjects included in this course and required by FAA-S-ACS-1 are Airframe Subject C-Flight Controls, D-Airframe Inspection, E-Landing Gear Systems, F-Hydraulic and Pneumatic Systems and N-Rotorcraft Fundamentals; Sections AM.II.C.R1 thru AM.II.C.R5, AM.II.C.S1 thru AM.II.C.S12, AM.II.D.R1 thru AM.II.D.R5, AM.II.D.S1 thru AM.II.D.S7, AM.II.E.R1 thru AM.II.E.R6, AM.II.E.S1 thru AM.II.E.S29, AM.II.F.R1 thru AM.II.F.R5, AM.II.F.S1 thru AM.II.F.S16 and AM.II.N.R1 thru AM.II.N.R4, AM.II.N.S1 thru AM.II.N.S4. (*Co-requisite:* AVT 215)
- AVT 217 Airframe Environmental, Instrument lighting and Water Systems 2**
 This course focuses on the function, operation, and inspection of aircraft systems, including the maintenance and repair of pressurization, air conditioning, and cabin pressurization systems. The Airframe Curriculum subjects included in this course and required by FAA-S-ACS-1 are Airframe Subject G-Environmental Systems, H-Airframe Instrument systems, I-Communications and Navigation Systems, and O-Water and Waste Water Systems; Sections AM.II.G.K1 thru AM.II.G.K9, AM.II.H.K1 thru AM.II.G.K24, AM.II.I.K1 thru AM.II.I.K21, AM.II.O.K1 thru AM.II.O.K3. (*Co-requisite:* AVT 218)
- AVT 218 Airframe Environmental, Instrument lighting and Water Systems Lab 2**
 This laboratory course incorporates the skills needed to apply information presented in AVT 217 and focuses on the function, operation and inspection of aircraft systems, including the maintenance and repair of pressurization, air conditioning, and cabin pressurization systems. The Airframe Curriculum subjects included in this course and required by FAA-S-ACS-1 are Airframe Subject G-Environmental Systems, H-Airframe Instrument systems, I-Communications and Navigation Systems, and O-Water and Waste Water Systems; Sections AM.II.G.R1 thru AM.II.G.R6, AM.II.G.S1 thru AM.II.G.S14, AM.II.H.R1 thru AM.II.H.R5, AM.II.H.S1 thru AM.II.H.S14, AM.II.I.R1 thru AM.II.I.R6, AM.II.I.S1 thru AM.II.I.S13, AM.II.O.R1, AM.II.O.S1 thru AM.II.O.S2. (*Co-requisite:* AVT 217)
- AVT 219 Airframe Fuel, Electrical, Ice & Fire Control Systems 2**
 This course focuses on aircraft fuel, electrical, ice & rain control systems, and fire protection systems. The fuel section involves fuel types, system components, fuel flow, system maintenance and inspection. The electrical section details AC and DC power systems, basic wiring, troubleshooting and repair. While the fire section describes the types of fires, correct extinguishing agents, detection and warning systems, maintenance, and inspection. The Airframe Curriculum subject included in this course and required by FAA-S-ACS-1 is Airframe Subject J-Aircraft Fuel Systems, K-Aircraft Electrical Systems, L-Ice and Rain Control Systems, and M-Airframe Fire Protection Systems; Sections AM.II.J.K1 thru AM.II.J.K9, AM.II.K.K1 thru AM.II.K.K17, AM.II.L.K1 thru AM.II.L.K7, AM.II.M.K1 thru AM.II.M.K7. (*Co-requisite:* AVT 220)

- AVT 220 Airframe Fuel, Electrical, Ice & Fire Control Systems Lab 3**
 This laboratory course incorporates the skills needed to apply information presented in AVT 219 and focuses on fuel types, system components, fuel flow, system maintenance and inspection. The electrical section details AC and DC power systems, basic wiring, troubleshooting and repair. While the fire section describes the types of fires, correct extinguishing agents, detection and warning systems, maintenance, and inspection. The Airframe Curriculum subject included in this course and required by FAA-S-ACS-1 is Airframe Subject J-Aircraft Fuel Systems, K-Aircraft Electrical Systems, L-Ice and Rain Control Systems, and M-Airframe Fire Protection Systems; Sections AM.II.J.R1 thru AM.II.J.R5, AM.II.J.S1 thru AM.II.J.S17, AM.II.K.R1 thru AM.II.K.R9, AM.II.K.S1 thru AM.II.K.S20, AM.II.L.R1 thru AM.II.L.R3, AM.II.M.R1 thru AM.II.M.R3, AM.II.M.S1 thru AM.II.M.S12. (*Co-requisite:* AVT 219)
- AVT 221 Aircraft Reciprocating Engines 3**
 This course focuses on the operating principles and theory of reciprocating engine operation, performance, maintenance and inspection. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject A-Reciprocating Engines; Sections AM.III.A.K1 thru AM.III.A.K10.
- AVT 222 Aircraft Reciprocating Engines Lab 3**
 This laboratory course incorporates the skills needed to apply information presented in AVT 221. Instruction focuses on applying the operating principles and theory of reciprocating engine operation, performance, maintenance and inspection. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject A-Reciprocating Engines; Sections AM.III.A.R1 thru AM.II.D.R4, AM.III.A.S1 thru AM.III.A.S9. (*Co-requisite:* AVT 221)
- AVT 223 Aircraft Turbine Engines 3**
 This course focuses on the operating principles and theory of turbine engines. Topics include types of turbines, construction, performance, troubleshooting, maintenance and inspection, engine adjustment, and testing. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject B-Turbine Engines; Sections AM.III.B.K1 thru AM.III.B.K11. (*Co-requisite:* AVT 224)
- AVT 224 Airframe Turbine Engines Lab 3**
 This laboratory course incorporates the skills needed to apply information presented in AVT 223. Instruction focuses on applying the operating principles and theory of turbine engines. Topics include types of turbines, construction, performance, troubleshooting, maintenance and inspection, engine adjustment, and testing. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject B-Turbine Engines; Sections AM.III.B.R1 thru AM.III.B.R4, AM.III.B.S1 thru AM.III.B.S13. (*Co-requisite:* AVT 223)
- AVT 225 Aircraft Engine, Fire Protection & Electrical Systems 2**
 This course focuses on engine inspection, instrument systems, fire protection systems, and electrical systems. The engine portion of this class will focus on inspection requirements, special inspections, compliance with required documentation and approved data. Along with engine instruments that monitor fuel flow, temperature, engine speed, along with warnings, caution and advisory lights. Engine fire protection

covers types of agents, types of fires and where they might occur, and maintenance and inspection of such systems. The final section of the class will discuss generators, alternators, AC and DC systems and procedures for correct wiring. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject C-Engine Inspection, D-Engine Instrument Systems, E-Engine Fire Protection Systems, and F-Engine Electrical Systems; Sections AM.III.C.K1 thru AM.III.C.K8, AM.III.D.K1 thru AM.III.D.K11, AM.III.E.K1 thru AM.III.E.K5, AM.III.F.K1 thru AM.III.F.K10. (*Co-requisite*: AVT 226)

- AVT 226 Aircraft Engine, Fire Protection & Electrical Systems Lab 3**
 This laboratory course incorporates the skills needed to apply information presented in AVT 226 and focuses on applying the inspection, maintenance, and compliance requirements for fire protection of engine and electrical systems. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject C-Engine Inspection, D-Engine Instrument Systems, E-Engine Fire Protection Systems, and F-Engine Electrical Systems; Sections AM.III.C.R1 thru AM.III.C.R3, AM.III.C.S1 thru AM.III.C.S14, AM.III.D.R1 thru AM.III.D.R2, AM.III.D.S1 thru AM.III.D.S19, AM.III.E.R1 thru AM.III.E.R3, AM.III.E.S1 thru AM.III.E.S14, AM.III.F.R1 thru AM.III.F.R4, AM.III.F.S1 thru AM.III.F.S15. (*Co-requisite*: AVT 225)
- AVT 227 Aircraft Lubrication, Ignition & Starting, Induction & Fuel Systems 2**
 This course focuses on engine lubrication systems, ignition and starting systems, engine fuel and fuel metering systems, and engine induction and cooling systems. Items discussed will include types of oil, types of lubrication systems, spark plugs, shower of sparks, digital engine controls, rotary and turbine engine ignition systems, fuel lines, fuel pumps, fuel valves, fuel filters, fuel drains, and reciprocating engine induction and cooling system theory, components and operation. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 is Powerplant Subject G-Engine Lubrication Systems, H-Ignition and Starting Systems, I-Engine Fuel and Fuel Metering Systems, J-Reciprocating Engine Induction and Cooling Systems; Sections AM.III.G.K1 thru AM.III.G.K7, AM.III.H.K1 thru AM.III.H.K9, AM.III.I.K1 thru AM.III.I.K16, AM.III.J.K1 thru AM.III.J.K10. (*Co-requisite*: AVT 228)
- AVT 228 Aircraft Lubrication, Ignition & Starting, Induction & Fuel Systems Lab 3**
 This laboratory course incorporates the skills needed to apply information presented in AVT 227, focusing on applying the components and operation requirements for fuel systems, ignition and starting systems, and induction and cooling systems. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 is Powerplant Subject G-Engine Lubrication Systems, H-Ignition and Starting Systems, I-Engine Fuel and Fuel Metering Systems, J-Reciprocating Engine Induction and Cooling Systems; Sections AM.III.G.R1 thru AM.III.G.R3, AM.III.G.S1 thru AM.III.G.S14, AM.III.H.R1 thru AM.III.H.R3, AM.III.H.S1 thru AM.III.H.S17, AM.III.I.R1 thru AM.III.I.R5, AM.III.I.S1 thru AM.III.I.S30, AM.III.J.R1 thru AM.III.J.R4, AM.III.J.S1 thru AM.III.J.S19. (*Co-requisite*: AVT 227)
- AVT 229 Aircraft Engine Air, Exhaust & Reverser Systems 2**
 This course will focus on turbine engine air systems, engine exhaust and reverser systems. Included in turbine air systems are insulation blankets and shrouds, baffles

and seals. Also discussed is bleed air system theory, components and operation. Exhaust and mufflers, hush kits and augments tubes are also included as part of air systems. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject K -Turbine Engine Air Systems, L-Engine Exhaust and Reverser Systems; Sections AM.III.K.K1 thru AM.III.K.K4, AM.III.L.K1 thru AM.III.L.K4. (*Co-requisite*: AVT 230)

- AVT 230 Aircraft Engine Air, Exhaust & Reverser Systems Lab 2**
This laboratory course incorporates the skills needed to apply information presented in AVT 229 and focuses on applying the requirements of turbine engine air systems, including exhaust and mufflers. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject K -Turbine Engine Air Systems, L-Engine Exhaust and Reverser Systems; Sections AM.III.K.R1 thru AM.III.K.R2, AM.III.K.S1 thru AM.III.K.S8, AM.III.L.R1 thru AM.III.L.R5, AM.III.L.S.1 thru AM.III.L.S7. (*Co-requisite*: AVT 229)
- AVT 231 Aircraft Propellers 1**
This course will focus on the operating principles and theory of propellers including types of propellers, construction, performance, troubleshooting, maintenance and inspection, and installation. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject M-Propellers; Sections AM.III.M.K1 thru AM.III.M.K10. (*Co-requisite*: AVT 232)
- AVT 232 Aircraft Propellers Lab 1**
This laboratory course incorporates the skills needed to apply information presented in AVT 231. Instruction focuses on applying the operating principles and theory of propellers including types of propellers, construction, performance, troubleshooting, maintenance and inspection, and installation. The Powerplant Curriculum subjects included in this course and required by FAA-S-ACS-1 are Powerplant Subject M-Propellers; Sections AM.III.M.R1 thru AM.III.M.R2, AM.III.M.S1 thru AM.III.M.S12. (*Co-requisite*: AVT 231)

Transportation Division -

Diesel Truck Technology (AAS)

Program Objective

The Diesel Truck Technology program prepares students as entry-level technicians with the latest information on diagnosis, repair procedures, preventive maintenance, and necessary safety applications in diesel technology. The course prepares students to take the voluntary mechanic certification test (ASE) in heavy-duty trucks. Graduates work as tune-up, brakes, transmission and refrigeration technicians; diesel truck repair and fleet maintenance technicians; service writing technicians; and sales and service representatives.

Career Opportunities

Typical employers of diesel truck technicians are truck, farm, and earth-moving equipment dealerships; trucking, power generation, and construction companies; truck service centers; engine repair/machine shops; truck equipment distributors; independent service garages; automotive parts manufacturers; sales representatives; and insurance companies.

Program Learning Goals

Goal 1: Graduates will possess the appropriate skills and safety awareness that are needed for decision-making and critical thinking for entry into the Diesel Truck Technology field.

Student Learning Outcomes - Students will:

- Understand the use of proper safety equipment, for both themselves and shop practices.
- Visualize situations to predict any concerns before attempting them.
- Multitask and follow safety precautions while displaying well thought-out time management.

Goal 2: Graduates will understand the importance of professional behavior and life-long learning within the Diesel Truck Industry.

Student Learning Outcomes - Graduates will:

- Communicate with managers, supervisors, or company owners in a professional and technical manner.
- Seek opportunities for continued training after graduation and keep up with current technology.

Goal 3: Graduates will meet the needs of the Diesel Truck Technology field. Graduates will be provided the skills that will provide them the opportunities in various areas of the diesel profession.

Student Learning Outcomes - Students will:

- Be able to troubleshoot heavy duty vehicle brake systems for safety concerns and faults.
- Diagnose a diesel engine and repair a variety of different types of engines.
- Diagnose and repair steering and suspension components
- Diagnose and repair drive line component issues
- Diagnose and repair HVAC components issues

Diesel Truck Technology Major Courses

DTT 129	Transportation Safety & Certifications	2
DTT 153	Brake Systems for Diesel	2
DTT 154	Brake Systems for Diesel Lab	1
DTT 155	Steering and Suspension Systems for Diesel	3
DTT 159	Advance Electrical Systems for Diesel	2
DTT 160	Advanced Electrical Systems for Diesel Lab	1
DTT 177	Diesel Fuel Injection and Emissions	2
DTT 178	Diesel Fuel Injection and Emissions Lab	1
DTT 179	Diesel Engine Performance and Tune-up Procedures	2
DTT 180	Diesel Engine Performance and Tune-up Procedures Lab	2
IET 101	Intro. to Diesel Electricity & Electronics	3
VMR 161	Welding and Flame Cutting for Vehicles	1
VMR 162	Welding and Flame Cutting for Vehicles Lab	2
DTT 277	Manual Transmission Overhaul	2
DTT 278	Manual Transmission Overhaul Lab	1
DTT 279	Differentials and Drive Line	3
DTT 281	Auto. Transmission Diagnostics, Basic Hydraulics	2
DTT 282	Auto. Transmission Diagnostics, Basic Hydraulics Lab	1
DTT 283	Applied Diesel Truck Principles and Applications	2
DTT 284	Applied Diesel Truck Principles and Applications Lab	2
or INT 299	Internship	4
DTT 285	Diesel Engine Overhaul	2
DTT 286	Diesel Engine Overhaul Lab	2
DTT 287	Advances in Diesel Truck Technology	1
VMR 251	HVAC Vehicle Systems	2
VMR 252	HVAC Vehicle Systems Lab	1

Core Career Courses

VMR 151	Intro. to Vehicle Maintenance & Repair Technology	2
BUS 101	Introduction to Business	3
CSM105	Customer Service	3
ENG 105	Industry Communication	3
MAT 101	College Algebra I and Trigonometry	3
or MAT 105	Math for the Transportation Division	
ART 125/126	Art in Industry & Lab	3
PHY 120	Physical Science	3
or SCI150	How it Works	
SSS 101	First-Year Experience	1

Minimum Credits to Graduate **66**

Diesel Truck Technology
Associate in Applied Science (AAS)
Semester Program Outline

Semester 1		Credits
VMR 151	Introduction to Vehicle Maintenance & Repair Technology	2
IET 101	Intro. to Diesel Electricity & Electronics	3
DTT 153	Brake Systems for Diesel	2
DTT 154	Brake Systems for Diesel Lab	1
DTT 155	Steering and Suspension Systems for Diesel	3
MAT 101	College Algebra I and Trigonometry	3
or MAT 105	Math for the Transportation Division	
SSS 101	First-Year Experience	1
		15
Semester 2		
DTT 159	Advance Electrical Systems for Diesel	2
DTT 160	Advanced Electrical Systems for Diesel Lab	1
DTT 177	Diesel Fuel Injection and Emissions	2
DTT 178	Diesel Fuel Injection and Emissions Lab	1
DTT 179	Diesel Engine Performance and Tune-up Procedures	2
DTT 180	Diesel Engine Performance and Tune-up Procedures Lab	2
ENG 105	Industry Communication	3
PHY 120	Physical Science	3
Or SCI150	How it Works	
		16
Semester 3		
DTT 277	Manual Transmission Overhaul	2
DTT 278	Manual Transmission Overhaul Lab	1
DTT 279	Differentials and Drive Line	3
DTT 285	Diesel Engine Overhaul	2
DTT 286	Diesel Engine Overhaul Lab	2
VMR 161	Welding and Flame Cutting for Vehicles	1
VMR 162	Welding and Flame Cutting for Vehicles Lab	2
BUS 101	Introduction to Business	3
ART 125/126	Art in Industry & Lab	3
		19
Semester 4		
DTT 129	Transportation Safety & Certifications	2
DTT 281	Automatic Transmission Diagnostics, Basic Hydraulics	2
DTT 282	Automatic Transmission Diagnostics, Basic Hydraulics/Lab	1
DTT 283	Applied Diesel Truck Principles and Applications	2
DTT 284	Applied Diesel Truck Principles and Applications Lab	2
or INT 299	Internship	
DTT 287	Advances in Diesel Truck Technology	1
VMR 251	HVAC Vehicle Systems	2
VMR 252	HVAC Vehicle Systems Lab	1
CSM105	Customer Service	3
		16
Minimum Credits to Graduate		66

Diesel Truck Technology Course Descriptions

Course No.	Course Title	Credits
DTT 129	Transportation & Safety Certifications This course is designed to provide necessary training and practical testing to assist in obtaining certifications for OSHA 10 Automotive Safety, MSHA Mine Safety Training Part 46, PA State Safety Inspections License, and Forklift Safety and Operating License. These certifications will provide students with credentials that employers in the transportation industry seek.	2
DTT 153	Brake Systems for Diesel This course covers information on hydraulic and air brake systems. Mechanical foundation, air supply, service system principles, major components, parking brake systems, brake system diagnostics, service to drum brake assemblies, air lines and hoses, brake switches, antilock brake principles and service are all a part of this course. High priority tasks recommended by ASE (Automotive Service Excellence) are covered.	3
DTT 154	Brake Systems Lab for Diesel This course covers information on hydraulic and air brake systems. Mechanical foundation, air supply, service system principles, major components, parking brake systems, brake system diagnostics, service to drum brake assemblies, air lines and hoses, brake switches, antilock brake principles and service are all a part of this course. High priority tasks recommended by ASE (Automotive Service Excellence) are covered.	1
DTT 155	Steering and Suspension Systems for Diesel This course covers information on steering and suspension systems, theory and principles, independent suspensions, geometric principles, factors affecting wheel alignment, tools and equipment used for steering and suspension, troubleshooting of suspension and steering, wheel bearings service, manual steering and power steering system operation. This lecture on theory will prepare students to take the ASE technician certification test for steering and suspension systems.	3
DTT 159	Advanced Electrical Systems for Diesel This course is designed to teach advanced diagnostic techniques, wire diagram reading with troubleshooting trees, and test equipment used in today's diesel-powered equipment industries. Students will be exposed to real world electrical and electronic problems and the detailed instruction on how to approach problems with critical and deductive thinking skills to solve these problems through a bottom-up and top-down approach. (<i>Prerequisite:</i> IET 101; <i>Co-requisite:</i> DTT 160)	2
DTT 160	Advanced Electrical Systems for Diesel Lab This course is designed to teach advanced diagnostic techniques, wire diagram reading with troubleshooting trees, and test equipment used in today's diesel-powered equipment industries. Students will be exposed to real world electrical and electronic problems and the detailed instruction on how to approach problems with critical and	1

deductive thinking skills to solve these problems through a bottom-up and top-down approach. (*Prerequisite:* IET 101; *Co-requisite:* DTT 159)

DTT 177	Diesel Fuel Injection and Emissions	2
	This course covers information on the theory and operation of the different types of diesel fuel injection pumps, nozzles and injectors, including current electronic fuel injectors. In-depth study of fuel system preventive maintenance, troubleshooting diagnostics, injection pump timing and installation procedures, and replacement methods for injectors and nozzles are taught.	
DTT 178	Diesel Fuel Injection and Emissions Lab	1
	This lab experience includes competency tasks on the diagnosis and service of the different types of diesel fuel injection pumps, nozzles and injectors, including current electronic fuel injectors. In-depth servicing and repair of fuel system preventive maintenance, troubleshooting diagnostics, injection pump timing and installation procedures, and replacement methods for injectors and nozzles are practiced in this lab. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite:</i> DTT 177)	
DTT 179	Diesel Engine Performance Tune-up Procedures	2
	This course covers information and theory on the operation and approved servicing, troubleshooting, and tune-up procedures on several different current models of diesel engines.	
DTT 180	Diesel Engine Performance Tune-up Procedures Lab	2
	This lab includes competency-based tasks on the operation and approved servicing, troubleshooting, and tune-up procedures on several different current models of diesel engines. Students will practice these competencies and be assessed on industry standards. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite:</i> DTT 179)	
DTT 277	Manual Transmission Overhaul	2
	This course covers the information and theory of heavy duty truck manual transmissions. New learning experiences include inspection, replacement, servicing, rebuild procedures, proper diagnostics of manual transmissions and power take-off systems.	
DTT 278	Manual Transmission Overhaul Lab	1
	This lab includes competency based tasks on the operation and approved servicing, troubleshooting, and tune-up procedures on several different current models of diesel engines. New learning experiences include inspection, replacement, servicing, rebuild procedures, proper diagnostics of manual transmissions and power take-off systems. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite:</i> DTT 277)	
DTT 279	Differentials and Drive Line	2
	This course covers the theory of operation of the heavy duty truck differentials and drive lines. Students will learn how the differential is used to transfer energy to the wheels of the vehicle. Students will be trained in the theory of transferring engine	

power to the final drive of the vehicle utilizing the drive shaft. All components of this system will be described and the operation of each will be explained.

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| DTT 280 | Differentials and Drive Line Lab | 1 |
| | This includes competency based tasks on overhaul, service and troubleshooting of the rear differentials and drive shafts. All safety procedures involved in working with differentials and drive lines will be followed while participating in the lab activities. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite</i> : DTT 279). | |
| DTT 281 | Automatic Transmission Diagnostics, Basic Hydraulics | 2 |
| | This course provides information and practical theory necessary to service automatic transmissions found in many heavy diesel trucks. Systematic troubleshooting procedures are all part of this program to assist the technician in the proper repair procedures, installation, and repair of hydraulic systems. | |
| DTT 282 | Automatic Transmission Diagnostics, Basic Hydraulics Lab | 1 |
| | This lab will have students performing competency tasks that include but are not limited to, transmission removal, disassembly, component inspection and measurements, and reassembly. Systematic troubleshooting procedure tasks are all part of this lab to assist the technician in the proper repair procedures, installation, and repair of hydraulic systems. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite</i> : DTT 281) | |
| DTT 283 | Applied Diesel Truck Principles and Applications | 2 |
| | This course is intended to re-examine and emphasize specific mechanical knowledge and diagnostic experience and to apply that to principles and theories learned in previous courses. Students are expected to improve their specific skills to prepare them for entry-level positions upon graduation. | |
| DTT 284 | Applied Diesel Truck Principles and Applications Lab | 2 |
| | This lab is intended to re-examine and emphasize specific mechanical skills and diagnostic techniques and to apply them to principles and theories learned in previous courses. Students are expected to hone the specific skills by performing competency tasks to industry standards. Doing this will prepare students for entry-level positions upon graduation. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite</i> : DTT 283) | |
| DTT 285 | Diesel Engine Overhaul | 2 |
| | Diesel engine principles of operation on four- and two-stroke engines are covered. Component identification, measurement and replacement, along with complete tear down and overhaul procedures are covered in this course. | |
| DTT 286 | Diesel Engine Overhaul Lab | 2 |
| | Diesel engine principles of operation on four- and two-stroke engines are covered with competency based tasks the students are required to perform. Component identification, measurement and replacement, along with complete tear down and overhaul procedures are practiced in this lab. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite</i> : DTT 285) | |

DTT 287	Advances in Diesel Truck Technology	2
	This course covers advances in truck subsystems, including vehicle onboard radar, lane departure, heads up display, roll stability, traction control, electric vehicles, hybrid vehicles. Description of system operation component identification diagnostic procedures and tooling and how to OEM integrates this technology.	
IET 101	Introduction to Diesel Electricity & Electronics	3
	This course covers the basic theories of electricity. It discusses how voltage, current, and resistance work as a unit to be what we consider electrical flow. It covers Ohm's Law, Watt's Law, electrical components, basic wiring diagram understanding, and lighting, giving the student information needed to understand electricity and how to test it. This background and basic knowledge help the student understand how electricity works and assists in troubleshooting problems identified in diesel trucks. It discusses the basic fundamentals of structure of matter and develops into a discussion of series, parallel, and series-parallel circuits. It covers the basic structure of conductors and insulators, and the theories of magnetism and magnetic fields.	
VMR 151	Introduction to Vehicle Maintenance & Repair Technology	2
	This course covers information on hand tools, machines, and equipment common to the vehicle maintenance field, general service procedures, lubricants, reference manuals, pre-delivery inspection of new and used vehicles and preventive maintenance procedures. This course is designed to prepare students to work properly with all of the for mentioned topics along with building safe and thorough work habits.	
VMR 161	Welding and Flame Cutting for Vehicles	1
	This course introduces the student to welding as it pertains to vehicle and equipment preventive maintenance and repair. The student will learn the necessary safety precautions pertaining to cutting and welding. Emphasis will be placed on maintenance tasks that technicians in the diesel and heavy equipment industry are required to perform.	
VMR 162	Welding and Flame Cutting for Vehicles Lab	2
	This course provides the student the opportunity to practice the skills learned in VMR 161. Students will apply the necessary safety precautions pertaining to cutting and welding with MIG and ARC welders and oxyacetylene combination torches. Emphasis will be placed on maintenance tasks that technicians in the diesel and heavy equipment industries are required to perform.	
VMR 251	HVAC Vehicle Systems	2
	This course covers information on the operation of heating and air conditioning as applied to today's cars and trucks. Students will learn the theory of air conditioning systems in passenger vehicles and light trucks, heavy-duty trucks and trailer refrigeration systems. New learning experiences in the troubleshooting and servicing of these systems are taught.	
VMR 252	HVAC Vehicle Systems Lab	1
	This lab covers competency tasks on the operation of heating and air conditioning systems. Students will utilize modern service equipment to perform competencies for recovering, recycling and recharging refrigerant in HVAC systems. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite:</i> VMR 251)	

Transportation Division -

Heavy Equipment Technology (AAS)

Program Objective

Coursework prepares students to succeed as well-trained, mechanically minded, hard-working technicians with heavy equipment dealers and contractors. Instruction involves classroom theory, live shop demonstrations, and repair of heavy equipment currently used in industry. Making repairs on actual equipment is vital to skill development.

Work Environment

Heavy equipment dealers and earth-moving contractors are top employers. Jobs are also available with mining and logging companies. Most technicians work in indoor shops, but experienced field service technicians travel to job sites to perform repairs.

Career Opportunities

- Mobile Heavy Equipment Technician
- Construction Equipment Technician
- Field Service Technician
- Dealer Service Technician

Program Learning Goals

Goal 1: Graduates will possess the skills necessary to correctly and safely operate equipment used in the heavy equipment industry.

Student Learning Outcomes - Students will:

- Practice the use of proper safety equipment.
- Visualize situations to predict any concerns before attempting them.
- Perform tasks following OSHA safety guidelines

Goal 2: Graduates will understand the importance of professional behavior within the Heavy Equipment Industry.

Student Learning Outcomes - Graduates will:

- Communicate with internal and external stakeholder in a professional and appropriate manner.
- Demonstrate professional skills as they relate to timeliness, accountability, and reliability.

Goal 3: Graduates will possess the skills necessary to obtain an entry-level heavy equipment technician position.

Student Learning Outcomes - Students will:

- Diagnose a diesel engine and repair a variety of different types of engines.
- Perform visual emissions inspections
- Troubleshoot hydraulic systems, mechanical systems, and electronics
- Maintain and repair drive train, steering, and suspension systems

Heavy Equipment Technology Major Courses

AUT 159	Electrical and Electronics Systems	1
DTT 129	Transportation Safety & Certifications	2
DTT 177	Diesel Fuel Injection & Emissions	2
DTT 178	Diesel Fuel Injection & Emissions Lab	1
HET 160	Heavy Equipment Electrical and Electronics Systems	1
VMR 161	Welding and Flame Cutting for Vehicles	1
VMR 162	Welding and Flame Cutting for Vehicles Lab	2
HET 153	Heavy Duty Brake Systems	1
HET 155	Fundamentals of Powertrain Technology	2
HET 156	Powertrain and Brake Systems Lab	2
HET 157	Hydraulics I	4
DTT 285	Diesel Engine Overhaul	2
DTT 286	Diesel Engine Overhaul Lab	2
HET 252	HVAC for HET Vehicle Systems Lab	1
HET 255	Hydraulics II	2
HET 259	Hydraulics III	2
HET 261	Introduction to John Deer Machines	1
HET 263	John Deere Vehicle Machine Electronics & Diagnostic Procedures	3
HET 264	John Deere Vehicles Lab	2
HET 265	John Deere Electronic Engine Maintenance Systems	2
HET 283	Applied Heavy Equipment Principles and Applications	1
HET 284	Applied Heavy Equipment Principles and Applications Lab	3
or INT 299	Internship	4
VMR 251	HVAC Vehicle Systems	1
Core Career Courses		
VMR 151	Intro. to Vehicle Maintenance & Repair Technology	2
MAT 101	College Algebra I & Trigonometry	3
ENG 105	Industry Communication	3
PHY 120	Physical Science	3
ART ###	Art Elective	3
BUS 101	Introduction to Business	3
CSM 105	Customer Service and Our World	3
SSS 101	First-year experience	1
Minimum Credits to Graduate		62

Heavy Equipment Technology (AAS)

Semester Program Outline

Semester 1		
DTT 129	Transportation Safety & Certifications	2
VMR 151	Intro. to Vehicle Maintenance & Repair Technology	2
HET 153	Heavy Duty Brake Systems	1
HET 155	Fundamentals of Powertrain Technology	2
HET 156	Powertrain and Brake Systems Lab	2
MAT 101	College Algebra I & Trigonometry	3
VMR 161	Welding and Flame Cutting for Vehicles	1
VMR 162	Welding and Flame Cutting for Vehicles Lab	2
SSS 101	First-year experience	1
		16
Semester 2		
DTT 285	Diesel Engine Overhaul	2
DTT 286	Diesel Engine Overhaul Lab	2
HET 157	Hydraulics I	4
DTT 177	Diesel Fuel Injection & Emissions	2
DTT 178	Diesel Fuel Injection & Emissions Lab	1
PHY 120	Physical Science	3
AUT 159	Electrical and Electronic Systems	1
HET 160	Heavy Equipment Electrical and Electronic Systems	1
		16
Semester 3		
VMR 251	HVAC Vehicle Systems	1
HET 252	HVAC for Heavy Equipment Vehicle Systems Lab	1
HET 261	Introduction to John Deer Machines	1
HET 263	John Deere Vehicle Machine Electronics & Diagnostic Procedures	3
HET 264	John Deere Vehicles Lab	2
HET 255	Hydraulics II	2
ENG 105	Industry Communication	3
ART ###	Art Elective	3
		16
Semester 4		
BUS 101	Introduction to Business	3
CSM 105	Customer Service and Our World	3
HET 283	Applied Heavy Equipment Principles and Applications	1
HET 284	Applied Heavy Equipment Principles and Applications Lab	3
or		
INT 299	Internship	4
HET 259	Hydraulics III	2
HET 265	John Deere Electronic Engine Maintenance Systems	2
		14
Minimum Credits to Graduate		62

Heavy Equipment Technology Course Descriptions

Course No.	Course Title	Credits
AUT 159	Electrical & Electronic Systems This course covers information on electricity, basic electrical circuits, tools and equipment, batteries, charging systems, starting systems, lighting systems, horn, wipers and washers, cooling fans, instrument circuits and body electrical systems. This will prepare students to take the ASE technician certification test for electrical systems. (<i>Co-requisite:</i> HET 160)	1
DTT 129	Transportation & Safety Certifications This course is designed to provide necessary training and practical testing to assist in obtaining certifications for OSHA 10 Automotive Safety, MSHA Mine Safety Training Part 46, PA State Safety Inspections License, and Forklift Safety and Operating License. These certifications will provide students with credentials that employers in the transportation industry seek.	2
DTT 177	Diesel Fuel Injection and Emissions This course covers information on the theory and operation of the different types of diesel fuel injection pumps, nozzles and injectors, including current electronic fuel injectors. In-depth study of fuel system preventive maintenance, troubleshooting diagnostics, injection pump timing and installation procedures, and replacement methods for injectors and nozzles are taught.	2
DTT 178	Diesel Fuel Injection and Emissions Lab This lab experience includes competency tasks on the diagnosis and service of the different types of diesel fuel injection pumps, nozzles and injectors, including current electronic fuel injectors. In-depth servicing and repair of fuel system preventive maintenance, troubleshooting diagnostics, injection pump timing and installation procedures, and replacement methods for injectors and nozzles are practiced in this lab. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite:</i> DTT 177)	1
DTT 285	Diesel Engine Overhaul Diesel engine principles of operation on four- and two-stroke engines are covered. Component identification, measurement and replacement, along with complete tear down and overhaul procedures are covered in this course.	2
DTT 286	Diesel Engine Overhaul Lab Diesel engine principles of operation on four- and two-stroke engines are covered with competency based tasks the students are required to perform. Component identification, measurement and replacement, along with complete tear down and overhaul procedures are practiced in this lab. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (<i>Co-requisite:</i> DTT 285)	2
HET 153	Heavy Duty Brake Systems Explanation and theory of brake systems common to heavy duty vehicles and	1

equipment. Selected topics include air, hydraulic, and anti-lock systems with emphasis on troubleshooting and practical applications of repair and maintenance. (Co-requisites: HET 155, HET 156)

- HET 155 Fundamentals of Powertrain Technology 2**
Introduction to the operation and theory of heavy-duty vehicle power train, including transmissions, clutches, drive shafts, differential carriers, axles, tracks, undercarriages, clutch-type steering systems, and final drives. Principles of torque multiplication and bearing adjustment are included, along with shop safety and selecting the correct tooling. (*Co-requisites:* HET 153, HET 156)
- HET 156 Powertrain & Brake Systems Lab 2**
Practical application of heavy vehicle and construction equipment powertrain and brake system components. Overhaul, component identification, adjustment, and repair procedures of heavy transmissions, drivelines, differentials, clutches, undercarriages, final drives, and bearings. Troubleshooting and repair of hydraulic and pneumatic brake systems and other instructor-selected topics. (*Co-requisites:* HET 153, HET 155)
- HET 157 Hydraulics I 4**
Foundation of hydraulic principles and system operation. Topics include the principles of flow and pressure within a mobile hydraulic system, how force is multiplied, the importance of velocity within a conductor, flow requirements within a hydraulic system, and the application of conductors within a system. Introduction to the various accessories used in mobile hydraulics, including accumulators, filters, maintenance procedures, coolers, and reservoir types as well as the operation of gear and vane pumps. Safety instructions involving working around hydraulic equipment are covered.
- HET 160 Heavy Equipment Electrical & Electronic Systems 1**
This course applies information on electricity, electrical circuits, tools and equipment, batteries, charging and starting systems, lighting systems, horn, wipers and washers, cooling fans, instrument circuits and body electrical systems for construction equipment and over-the-road trucks. (Co-requisite: AUT 159)
- HET 252 HVAC for Heavy Equipment Vehicle Systems Lab 1**
Introduction to basic heating and air conditioning systems with an emphasis on systems common to construction equipment and over-the-road trucks. Topics to be covered include basic heating systems, refrigeration principles, component identification, component function, refrigerants, environmental concerns, system testing, diagnosis, and repair. (*Co-requisite:* VMR 251)
- HET 255 Hydraulics II 2**
Study of the operation, disassembly, evaluation, assembly and various setup procedures and their application to piston pumps. Course work includes learning to disassemble, explain the operation, evaluate failures, assemble, and perform the various setup procedures on hydraulic valves. Topics include the various systems on hydraulic equipment and how to read a schematic. Hands-on practice also includes disassembling, evaluating, learning the various seals of, and performing the proper reassembly procedures for hydraulic cylinders.

HET 259	Hydraulics III 2 Study of troubleshooting hydraulic systems, hydrostatic transmissions and hydraulic-assist transmissions. The course deals heavily in the use of test equipment and schematic reading. Emphasis on the operation, control, and repair of the hydrostatic transmission. The control portion emphasizes mechanical, hydraulic-over-hydraulic, and electric-over-hydraulic controls. Torque converter and retarder operation is included within the hydraulic-assist transmission portion.
HET 261	Introduction to John Deere Machines 1 Introduction to the operation of most commonly used John Deere earthmoving equipment. Safety, inspection checklist, start-up procedures, and proper operation techniques are explored. Service access and connection areas are identified along with lifting, support, and towing locations.
HET 263	John Deere Machine Electronics & Diagnostic Procedures 3 Introduction to John Deere machine electronics and monitoring systems, including the theoretical and practical operations of each system. Topics include component and symbols identification, wiring diagrams and schematics, John Deere Vital Information Management System (VIMS), John Deere Electronics, and Computer Monitoring System (CMS). Measuring instruments and tools, both off-board and on-board, are used for diagnostic and troubleshooting procedures.
HET 264	John Deere Vehicles Lab 2 Introduction to the operation of most commonly used John Deere earth moving equipment. Safety, inspection checklist, start-up procedures, and proper operation techniques are explored. Service access and connection areas are identified along with lifting, support, and towing locations.
HET 265	John Deere Electronic Engine Maintenance Systems 2 Introduction to the theory and operation of John Deere electronic fuel injection systems, operation, and troubleshooting. Emphasis on utilizing John Deere's computer-based diagnostic program and online service information. Topics include electronic fuel systems, emissions, parts and components identification, usage and operation, electronic governing, and set-up of programmable functions using laptop computers. Introductory coverage of advanced electrical/electronic system principals, sensor type and function, sensor testing, system analysis using a digital multimeter (DMM) and/or special tooling, schematics, and wiring diagrams is included.
HET 283	Applied Heavy Equipment Principles and Applications 1 This course is intended to re-examine and emphasize specific mechanical knowledge and diagnostic experience and to apply that to principles and theories learned in previous courses. Students are expected to hone the specific skills to prepare them for entry-level positions upon graduation.
HET 284	Applied Heavy Equipment Principles and Applications Lab 3 This lab is intended to re-examine and emphasize specific mechanical skills and diagnostic techniques and to apply them to principles and theories learned in previous courses. Students are expected to hone the specific skills by performing competency

tasks to industry standards. Doing this will prepare students for entry-level positions upon graduation. (*Co-requisite:* HET 284)

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| VMR 151 | Introduction to Vehicle Maintenance & Repair Technology | 2 |
| | This course covers information on hand tools, machines, and equipment common to the vehicle maintenance field, general service procedures, lubricants, reference manuals, pre-delivery inspection of new and used vehicles and preventive maintenance procedures. This course is designed to prepare students to work properly with all of the aforementioned topics along with building safe and thorough work habits. | |
| VMR 161 | Welding and Flame Cutting for Vehicles | 1 |
| | This course introduces the student to welding as it pertains to vehicle and equipment preventive maintenance and repair. The student will learn the necessary safety precautions pertaining to cutting and welding. Emphasis will be placed on maintenance tasks that technicians in the diesel and heavy equipment industry are required to perform. | |
| VMR 162 | Welding and Flame Cutting for Vehicles Lab | 2 |
| | This course provides the student the opportunity to practice the skills learned in VMR 161. Students will apply the necessary safety precautions pertaining to cutting and welding with MIG and ARC welders and oxyacetylene combination torches. Emphasis will be placed on maintenance tasks that technicians in the diesel and heavy equipment industries are required to perform. | |
| VMR 251 | HVAC Vehicle Systems | 1 |
| | This course covers information on the operation of heating and air conditioning as applied to today's cars and trucks. Students will learn the theory of air conditioning systems in passenger vehicles and light trucks, heavy-duty trucks and trailer refrigeration systems. New learning experiences in the troubleshooting and servicing of these systems are taught. This will prepare students to take the ASE technician certification test for HVAC systems. (<i>Co-requisite:</i> VMR 252). Students will receive Mobile Air Conditioning refrigerant recovery and handling, Act 609, certification in this course | |

CERTIFICATE PROGRAMS

Building and Property Maintenance (Certificate)

The Building and Property Maintenance certificate program will prepare students to enter the workforce ready to perform general maintenance and upkeep on buildings and properties. Students will learn basic maintenance and repair skills required in the upkeep of building and property systems. Instruction includes areas such as air conditioning, heating, plumbing, electrical, and major appliances, grounds keeping, computer skills and customer service

Graduates work as maintenance mechanics, general maintenance workers, grounds keepers and maintenance technicians.

Typical employers are hotels, government entities, educational institutions, retirement communities, resorts, healthcare facilities and apartment complexes.

Program Goals

Goal 1: Graduates will possess the skills necessary to obtain entry-level maintenance positions.

Student Learning Outcomes - Students will:

- Demonstrate competency in basic electrical skills.
- Demonstrate competency in basic carpentry skills.
- Demonstrate competency in basic maintenance.
- Practice safe working conditions according to OSHA standards.

Goal 2: Graduates will develop critical thinking skills for troubleshooting and prioritizing tasks.

Student Learning Outcomes - Students will:

- Demonstrate the ability to identify maintenance requirements, including preventative maintenance and repair needs.
- Prioritize tasks for efficient repair and maintenance of property and buildings.

Goal 3: Graduates will develop customer service and communication skills.

Student Learning Outcomes - Students will:

- Develop clear and effective written and oral communication skills.
- Develop skills necessary to serve internal and external customers with respect and exceptional service.
- Develop the employability skills necessary to become a productive member of the workforce.
- Enhance computer skills to facilitate effective communication requirements.

Building and Property Maintenance (Certificate)

Major Courses

BPM 101	Basics of Property Maintenance	1
BPM 102	Basics of Property Maintenance Lab	2
BPM 151	Building Finishes	2
BPM 152	Building Finishes Lab	4
BTT 103	Introduction to Pipefitting	2
BTT 105	Introduction to Electricity for the Trades	1
BTT 106	Introduction to Electricity for the Trades Lab	2
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
ART 110	Contract Drawings	3
CSM 105	Customer Service and Our World	3
CPT 101	Microcomputer	3
MAT 123	Math for Carpenters	1
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
SSS 101	First-Year Experience	1
		31

Building and Property Maintenance (Certificate) Semester Program Outline

Semester 1		Credits
ART 110	Contract Drawings	3
BPM 101	Basics of Property Maintenance	1
BPM 102	Basics of Property Maintenance Lab	2
BTT 103	Introduction to Pipefitting	2
BTT 105	Introduction to Electricity for the Trades	1
BTT 106	Introduction to Electricity for the Trades Lab	2
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
SSS 101	First-Year Experience	1
Total Semester 1		15
Semester 2		
BPM 151	Building Finishes	2
BPM 152	Building Finishes Lab	4
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
CPT 101	Microcomputer I	3
CSM 105	Customer Service and Our World	3
MAT 123	Math for Carpenters	1
Total Semester 2		16
TOTAL CREDITS CERTIFICATE		31

Building and Property Maintenance (Certificate) Course Descriptions

Course No.	Course Title	Credits
BPM 101	Basics of Property Maintenance This course will familiarize students with the basic skills needed to maintain commercial and residential properties. Students learn basic skills in electricity, carpentry, plumbing, HVAC, appliance repair, pest control, grounds keeping, and weatherization.	2
BPM 102	Basics of Property Maintenance Lab This course allows the students to apply the concepts covered in BPM 101. Students will apply the basic skills needed to maintain commercial and residential properties in the following areas: electrical, carpentry, HVAC, appliance repair, pest control, groundskeeping, and weatherization. (<i>Co-requisite</i> : BPM 101)	1
BPM 151	Building Finishes and Repair Building Finishes and Repair is the study of common materials and procedures used for finishing the interior and exterior of a building. Students will be exposed to skills in the safe use of equipment and materials common to the construction industry.	2
BPM 152	Building Finishes and Repair Lab This course provides the opportunity for students to apply the theory and concepts of BPM 151. Students will practice procedures used for finishing the interior and exterior of a building. (<i>Co-requisite</i> : BPM 151)	4
BTT 103	Introduction to Pipefitting This introductory pipefitting course provides students with a basic understanding of the materials, processes and tools used in residential and light commercial applications. Students will learn safe-work practices, as well as common components and fixtures that are installed in various settings.	2
BTT 105	Introduction to Electricity for the Trades This course provides introductory information and practical experience in installation of basic electrical systems in residential and commercial applications. This course will demonstrate proper usage of both electrical hand tool and power tools. This course will discuss basic electrical theories and codes.	1
BTT 106	Introduction to Electricity for the Trades Lab This course provides introductory information and practical experience in installation of basic electrical systems in residential and commercial applications. This course will demonstrate proper usage of both electrical hand tool and power tools. This course will discuss basic electrical theories and codes. Lab times for this course will be scheduled both on and off campus. (<i>Co-requisite</i> : BTT 105)	2
BTT 151	Fundamentals of Electricity This course covers general safety principles, basic construction guidelines, and laws governing electricity emphasizing theoretical concepts. Fundamentals such as Ohm's	2

Law as it relates to DC and AC circuits will be covered in depth. Electrical components such as resistors, capacitors, and inductors will be examined.

BTT 152

Fundamentals of Electricity Lab

1

This course covers general safety principles, basic construction guidelines and laws governing electricity, basic hand tool usage, print reading, electrical safety, circuit construction and operation. This course will also begin to outline use and interpretation of the National Electrical Code (NEC). (Co-requisite: BTT 151)

Diesel Preventative Maintenance Technology (Certificate)

The Diesel Preventative Maintenance Technician program prepares students to enter the workforce ready to perform routine repair procedures, preventive maintenance, and safety applications. Graduates work as brake technicians as well as perform routine maintenance and make general repairs.

Typical employers of Diesel Preventative Maintenance technicians are truck, farm, and earth-moving equipment dealerships; trucking companies; truck service centers; engine repair/machine shops; truck equipment distributors; independent service garages.

Program Learning Goals

Goal 1: Graduates will possess the appropriate skills and safety awareness that are needed for entry into the diesel preventative maintenance field.

Student Learning Outcomes - Students will:

- Understand the use of proper safety equipment, for both themselves and shop practices.
- Visualize situations to predict any concerns before attempting them.
- Identify and select the appropriate tools for the job at hand.
- Perform preventative maintenance on light and heavy trucks.

Diesel Preventative Maintenance Technology (Certificate)

Major Courses

DTT 153	Brake Systems for Diesel	2
DTT 154	Brake Systems for Diesel Lab	1
DTT 155	Steering and Suspension Systems for Diesel	3
DTT 159	Advance Electrical Systems for Diesel	2
DTT 160	Advanced Electrical Systems for Diesel Lab	1
DTT 177	Diesel Fuel Injection & Emissions	2
DTT 178	Diesel Fuel Injection & Emissions Lab	1
DTT 179	Diesel Engine Performance and Tune-Up Procedures	2
DTT 180	Diesel Engine Performance and Tune-Up Procedures Lab	2
IET 101	Intro. to Diesel Electricity & Electronics	3
VMR 151	Introduction to Vehicle Maintenance & Repair Technology	2
VMR 161	Welding and Flame Cutting for Vehicles	1
VMR 162	Welding and Flame Cutting for Vehicles Lab	2
Core Career Courses		
MAT 105	Math for the Transportation Division	3
or MAT 101	College Algebra and Trigonometry I	
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
SSS 101	First-Year Experience	1
		33

Diesel Preventative Maintenance Technology (Certificate) Semester Program Outline

Semester 1		Credits
VMR 151	Introduction to Vehicle Maintenance & Repair Technology	2
IET 101	Intro. to Diesel Electricity & Electronics	3
DTT 153	Brake Systems for Diesel	2
DTT 154	Brake Systems for Diesel Lab	1
DTT 155	Steering and Suspension Systems for Diesel	3
VMR 161	Welding and Flame Cutting for Vehicles	1
VMR 162	Welding and Flame Cutting for Vehicles Lab	2
MAT 101	College Algebra I and Trigonometry	3
or MAT 105	Math for the Transportation Division	
SSS 101	First-Year Experience	1
Total Semester 1		17
Semester 2		
DTT 159	Advanced Electrical Systems for Diesel	2
DTT 160	Advanced Electrical Systems for Diesel Lab	1
DTT 177	Diesel Fuel Injection and Emissions	2
DTT 178	Diesel Fuel Injection and Emissions Lab	1
DTT 179	Diesel Engine Performance and Tune-up Procedures	2
DTT 180	Diesel Engine Performance and Tune-up Procedures Lab	2
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
CPT 101	Microcomputer I	3
Total Semester 2		16
TOTAL CREDITS CERTIFICATE		33

Diesel Preventative Maintenance Technology (Certificate) Course Descriptions

Course No.	Course Title	Credits
DTT 153	Brake Systems for Diesel This course covers information on hydraulic and air brake systems. Mechanical foundation, air supply, service system principles, major components, parking brake systems, brake system diagnostics, service to drum brake assemblies, air lines and hoses, brake switches, antilock brake principles and service are all a part of this course. High priority tasks recommended by ASE (Automotive Service Excellence) are covered.	3
DTT 154	Brake Systems Lab for Diesel This course covers information on hydraulic and air brake systems. Mechanical foundation, air supply, service system principles, major components, parking brake systems, brake system diagnostics, service to drum brake assemblies, air lines and hoses, brake switches, antilock brake principles and service are all a part of this course. High priority tasks recommended by ASE (Automotive Service Excellence) are covered.	1
DTT 155	Steering and Suspension Systems for Diesel This course covers information on steering and suspension systems, theory and principles, independent suspensions, geometric principles, factors affecting wheel alignment, tools and equipment used for steering and suspension, troubleshooting of suspension and steering, wheel bearings service, manual steering and power steering system operation. This lecture on theory will prepare students to take the ASE technician certification test for steering and suspension systems.	3
DTT 159	Advanced Electrical Systems for Diesel This course is designed to teach advanced diagnostic techniques, wire diagram reading with troubleshooting trees, and test equipment used in today's diesel powered equipment industries. Students will be exposed to real world electrical and electronic problems and the detailed instruction on how to approach problems with critical and deductive thinking skills to solve these problems through a bottom-up and top-down approach. (<i>Co-requisite: DTT 160</i>)	2
DTT 160	Advanced Electrical Systems for Diesel Lab This course is designed to teach advanced diagnostic techniques, wire diagram reading with troubleshooting trees, and test equipment used in today's diesel powered equipment industries. Students will be exposed to real world electrical and electronic problems and the detailed instruction	1

on how to approach problems with critical and deductive thinking skills to solve these problems through a bottom-up and top-down approach. (*Co-requisite*: DTT 159)

- DTT 177 Diesel Fuel Injection and Emissions 2**
This course covers information on the theory and operation of the different types of diesel fuel injection pumps, nozzles and injectors, including current electronic fuel injectors. In-depth study of fuel system preventive maintenance, troubleshooting diagnostics, injection pump timing and installation procedures, and replacement methods for injectors and nozzles are taught.
- DTT 178 Diesel Fuel Injection and Emissions Lab 1**
This lab experience includes competency tasks on the diagnosis and service of the different types of diesel fuel injection pumps, nozzles and injectors, including current electronic fuel injectors. In-depth servicing and repair of fuel system preventive maintenance, troubleshooting diagnostics, injection pump timing and installation procedures, and replacement methods for injectors and nozzles are practiced in this lab. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (*Co-requisite*: DTT 177)
- DTT 179 Diesel Engine Performance Tune-up Procedures 2**
This course covers information and theory on the operation and approved servicing, troubleshooting, and tune-up procedures on several different current models of diesel engines.
- DTT 180 Diesel Engine Performance Tune-up Procedures Lab 2**
This lab includes competency based tasks on the operation and approved servicing, troubleshooting, and tune-up procedures on several different current models of diesel engines. Students will practice these competencies and be assessed on industry standards. High priority tasks recommended by ASE (Automotive Service Excellence) are covered. (*Co-requisite*: DTT 179)
- IET 101 Introduction to Automotive & Diesel Electronics 3**
This course will provide the student with an introduction to DC electric principles and the different electronic devices seen in modern diesel and automotive vehicles. It will explain instruments and procedures used in testing and measuring these devices. Students will learn basic electricity and the theory behind Ohm's Law. Students will learn how to apply Ohm's law in an electrical circuit. Students will practice building simple circuits and be able to troubleshoot and calculate current, resistance and voltage in a circuit. This course is designed to give students a head start on the electrical and electronics in modern passenger cars, light trucks and heavy duty vehicles.

- VMR 151 Introduction to Vehicle Maintenance & Repair Technology 2**
This course covers information on hand tools, machines, and equipment common to the vehicle maintenance field, general service procedures, lubricants, reference manuals, pre-delivery inspection of new and used vehicles and preventive maintenance procedures. This course is designed to prepare students to work properly with all of the for mentioned topics along with building safe and thorough work habits.
- VMR 161 Welding and Flame Cutting for Vehicles 1**
This course introduces the student to welding as it pertains to vehicle and equipment preventive maintenance and repair. The student will learn the necessary safety precautions pertaining to cutting and welding. Emphasis will be placed on maintenance tasks that technicians in the diesel and heavy equipment industry are required to perform.
- VMR 162 Welding and Flame Cutting for Vehicles Lab 2**
This course provides the student the opportunity to practice the skills learned in VMR 161. Students will apply the necessary safety precautions pertaining to cutting and welding with MIG and ARC welders and oxyacetylene combination torches. Emphasis will be placed on maintenance tasks that technicians in the diesel and heavy equipment industries are required to perform.

Industrial Technology (Certificate)

Industrial technicians keep machines in working order by detecting and correcting errors before the machine or the products it produces are damaged. After diagnosing a problem, the industrial machinery mechanic may take the equipment apart to repair or replace the necessary parts. Once a repair is made, industrial mechanics test a machine to ensure that it is operating correctly.

Graduates will be to work in machine or fabrication shops and distribution warehouses.

Program Learning Goals:

Goal 1: Graduates will acquire the skills necessary to obtain an entry-level position in the Industrial Electronic Maintenance.

Student Learning Outcomes - Students will:

- Perform tasks in accordance to OSHA guidelines
- Recognize the effects of mechanical malfunctions
- Employ corrective actions to make repairs to system under test

Goal 2: Graduates will demonstrate professional behavior and ethics in order to meet the challenges of work within their field.

Student Learning Outcomes - Students will:

- Work in a team environment
- Acknowledge diversity as a benefit to all organizations
- Practice professionalism through consideration and respect for others

Goal 3: Graduates will acquire critical thinking and decision-making skills.

Student Learning Outcomes - Students will:

- Analyze various components of project requirements to develop solutions
- Make decisions based on skills and knowledge of industry inputs
- Effectively use software to help solve industry challenges

Industrial Technology (Certificate)

Major Courses

DTT 129	Transportation Safety & Forklift	1
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
BTT 251	Motors and Controls	2
BTT 252	Motors and Controls Lab	4
ECM 277	Industrial Maintenance and Mechanics	2
ECM 278	Industrial Maintenance and Mechanics Lab	1
MEC 157	Sensors and Systems in Automation	2
MEC 158	Sensors and Systems in Automation Lab	1
MEC 201	Applied Industrial Technology	1
MEC 202	Applied Industrial Technology Lab	2
MEC 245	Programmable Logic Controllers 1	2
MEC 246	Programmable Logic Controllers 1 Lab	2

Core Career Courses

ART 105	Blueprint / Schematic Reading	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
MAT 103	Technical Math	3
SSS 101	First-Year Experience	1
		33

Industrial Technology (Certificate) Semester Program Outline

Semester 1		Credits
BTT 151	Fundamentals of Electricity	2
BTT 152	Fundamentals of Electricity Lab	1
DTT 129	Transportation Safety & Forklift	1
MEC 245	Programmable Logic Controllers I	2
MEC 246	Programmable Logic Controllers I Lab	2
ART 105	Blueprint / Schematic Reading	3
MAT 103	Technical Math	3
SSS 101	First-Year Experience	<u>1</u>
		15
Semester 2		
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
BTT 251	Motors and Controls	2
BTT 252	Motors and Controls Lab	4
MEC 157	Sensors and Systems in Automation	2
MEC 158	Sensors and Systems in Automation Lab	1
ECM 277	Industrial Maintenance and Mechanics	2
ECM 278	Industrial Maintenance and Mechanics Lab	1
MEC 201	Applied Industrial Technology	2
MEC 202	Applied Industrial Technology Lab	1
		18
TOTAL CREDITS CERTIFICATE		33

Course Descriptions

Course No.	Course Title	Credits
BTT 151	Fundamentals of Electricity This course covers general safety principles, basic construction guidelines, and laws governing electricity emphasizing theoretical concepts. Fundamentals such as Ohm's Law as it relates to DC and AC circuits will be covered in depth. Electrical components such as resistors, capacitors, and inductors will be examined.	2
BTT 152	Fundamentals of Electricity Lab This course covers general safety principles, basic construction guidelines and laws governing electricity, basic hand tool usage, print reading, electrical safety, circuit construction and operation. This course will also begin to outline use and interpretation of the National Electrical Code (NEC). (<i>Co-requisite</i> : BTT 151)	1
BTT 251	Motor and Controls This course covers the fundamental concepts of motors and motor controls. Topics include ladder diagrams, pilot devices, contactors, motor starters, motors, and other control devices. This course also covers service and repair principles and practices for industrial electrical systems, industrial electronic devices, programmable controllers, welding, boilers, HVAC, mechanical and pneumatic and fluid power systems. Upon completion, students will be able to properly select, connect, and troubleshoot motors and control circuits. (<i>Prerequisite</i> : BTT 151, BTT 152)	2
BTT 252	Motor and Controls Lab This course provides students with the opportunity to apply the theory and concepts covered in BTT 251. Students will practice working with ladder diagrams, pilot devices, contactors, motor starters, motors, and other control devices. They will also work with industrial electrical systems, industrial electronic devices, programmable controllers, welding, boilers, HVAC, mechanical and pneumatic and fluid power systems. Upon completion, students will be able to properly select, connect, and troubleshoot motors and control circuits. (<i>Prerequisite</i> : BTT 151, BTT 152; <i>Co-requisite</i> : BTT 251)	4
DTT 129	Transportation & Safety Certifications This course is designed to provide necessary training and practical testing to assist in obtaining certifications for OSHA 10 Automotive Safety, MSHA Mine Safety Training Part 46, PA State Safety Inspections License, and Forklift Safety and Operating License. These certifications	2

will provide students with credentials that employers in the transportation industry seek.

- ECM 277 Industrial Maintenance and Mechanics 2**
This course covers the theory and practice of industrial mechanics including calculations, rigging, lifting, ladders, hydraulics, lubrication, flexible belt drive systems, vibration and alignment. This course also covers service and repair principles and practices for industrial electrical systems, industrial electronic devices, programmable controllers, boilers, HVAC, mechanical, pneumatic and fluid power system.
- ECM 278 Industrial Maintenance and Mechanics Lab 1**
This course provides students with the opportunity to apply the knowledge learned in ECM 277. Students will practice of industrial mechanics including calculations, rigging, lifting, ladders, hydraulics, lubrication, flexible belt drive systems, vibration and alignment. Students will also cover service and repair principles and practices for industrial electrical systems, industrial electronic devices, programmable controllers, boilers, HVAC, mechanical, pneumatic and fluid power systems. (*Co-requisite: ECM 277*)
- MEC 201 Applied Industrial Technology 2**
This course is intended to re-examine and emphasize specific skills and diagnostic techniques and apply them to principles and theories learned in previous courses.
Students are expected to hone the specific skills to prepare them for entry-level positions upon graduation.
- MEC 202 Applied Industrial Technology Lab 1**
This course accompanies MEC 201 and is intended to re-examine and emphasize specific skills and diagnostic and testing techniques and apply them to principles and theories learned in previous courses. Students are expected to hone the specific skills to prepare them for entry-level positions upon graduation. (*Co-requisite: MEC 201*)
- MEC 157 Sensors and Systems in Automation 2**
This course will introduce the students to common types of detection sensors used in automation. The theory of operation, setup in control circuits and troubleshooting will also be covered. The course will also introduce the student to pneumatic and hydraulic systems used in the industrial setting for control of actuators and grippers in an automated system. (*Prerequisites: EET 161, EET 162, MEC 155, MEC 156; Co-requisite: MEC 157*)
- MEC 158 Sensors and Systems in Automation Lab 1**

This course will introduce the students to common types of detection devices used in automation through hands on experimentation. The student will set-up, operate and troubleshoot practical problems in a laboratory setting. The course will also introduce the student to pneumatic and hydraulic systems used in the industrial setting for control of actuators and grippers in an automated system. The student will work with hydraulic and pneumatic systems to deal with the concepts of setup and integration of these systems into the larger control scheme of an automated system (*Prerequisites*: EET 161, EET 162, MEC 155, MEC 156; *Co-requisite*: MEC 157)

MEC 245 Programmable Logic Controllers I 2

This course is designed to introduce the student to modern programmable logic controllers base on Control Logix and Compact Logix Programmable Automation Controllers (PAC's). The student will investigate the specification, setup, configuration, programming, and implementation of the controller. The course then continues with an examination of the different types of hardware devices that are used in conjunction with PAC's. An emphasis is placed on programming projects throughout the course. (*Co-requisite*: MEC 246, MEC 243, MEC 244)

MEC 246 Programmable Logic Controllers I Lab 2

The student will investigate the setup, configuration, programming, and implementation of the controllers through lab exercises designed to have the student build a system from beginning to end. As the student progresses through this course the experiments will progressively build toward real world applications. (*Co-requisite*: MEC 245, MEC 243, MEC 244)

Welding Technology (Certificate)

The Welding Technology certificate course prepares students for entry-level work in the welding industry. Students learn about safety, hand tools, oxy-acetylene torches, plasma arc, shielded metal arc welding (stick), gas metal arc welding (MIG), gas tungsten arc welding (TIG), flux cored arc welding, metallurgy, print reading, and weld symbols.

Graduates work as welders, welder/fabricators, maintenance welders, fitters, ornamental metal sculptors, and welder helpers.

Typical employers in the welding industry include structural steel fabricators, custom metal shops, industrial contractors, shipyards, pipe and pressure vessel fabricators, and retail welding sales.

Program Learning Goals:

Goal 1: The welding program will prepare the graduates for entry level employment in welding.

Student Learning Outcomes - Students will:

- Demonstrate safe welding practices
- Perform basic welding skills in SMAW (stick), GMAW (mig), GTAW (tig) and oxyfuel cutting procedures
- Perform basic maintenance on welding machines
- Interpret basic welding symbols

Welding Technology (Certificate)

Major Courses

WTC 151	Shielded Metal Arc Welding	2
WTC 152	Shielded Metal Arc Welding Lab	4
WTC 153	Gas Metal and Flux Cored Arc Welding I	1
WTC 154	Gas Metal and Flux Cored Arc Welding I Lab	2
WTC 155	Gas Metal and Flux Cored Arc Welding II	1
WTC 156	Gas Metal and Flux Cored Arc Welding II Lab	2
WTC 157	Gas Tungsten Arc Welding	2
WTC 158	Gas Tungsten Arc Welding Lab	4

Core Career Courses

ART 101	Blueprint Reading	2
MAT 100	Applied Mathematics for Welders	3
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
SSS 101	First-Year Experience	1
		30

Welding Technology (Certificate) Semester Program Outline

Semester 1		Credits
WTC 151	Shielded Metal Arc Welding I	2
WTC 152	Shielded Metal Arc Welding I Lab	4
WTC 153	Gas Metal and Flux Cored Arc Welding I	1
WTC 154	Gas Metal and Flux Cored Arc Welding I Lab	2
ART 101	Blueprint Reading	2
MAT 100	Applied Mathematics for Welders	3
SSS 101	First-Year Experience	1
Total Semester 1		15
Semester 2		
WTC 155	Gas Metal and Flux Cored Arc Welding II	1
WTC 156	Gas Metal and Flux Cored Arc Welding II Lab	2
WTC 157	Gas Tungsten Arc Welding	2
WTC 158	Gas Tungsten Arc Welding Lab	4
CPT 101	Microcomputer I	3
ENG 101	English Composition I	3
or ENG 105	Industry Communication	
Total Semester 2		15
TOTAL CREDITS CERTIFICATE		30

Welding Technology Course Descriptions

Course No.	Course Title	Credits
WTC 151	Shielded Metal Arc Welding This course is designed to teach the student the basic safety, principles, practices, and applications of SMAW. This course covers welding trade theory including safety, tool usage, equipment set up and standard terms and definitions. Basic welding and cutting techniques in the flat, horizontal, vertical and overhead position, tank safety and welding safety will be taught. The course also covers basic metallurgy and how to identify weld problems and defects. This course will progress to the most advanced SMAW practices with concentration on vertical and overhead welding techniques conforming to the AWS structural welding code. Weld problems, corrections and specific techniques will be covered in this course.	2
WTC 152	Shielded Metal Arc Welding Lab This course is designed to allow students to apply the theory and techniques taught in WTC151 Shielded Metal Arc Welding. Student will practice basic safety, principles, practices, and applications of SMAW, basic welding and cutting techniques in various positions. Weld problems, corrections and specific techniques will also be practiced in this course. (Co-requisite: WTC 152)	4
WTC 153	Gas Metal and Flux Cored Arc Welding I This course is designed to teach the student the basic principles, practices, and applications of GMAW and FCAW. This course covers gas metal arc welding and flux cored arc welding in the flat and horizontal position. Students will be given classroom theory and hands on instruction in both processes. American Welding Society weld symbols will also be covered.	1
WTC 154	Gas Metal and Flux Cored Arc Welding I Lab This course is designed to allow students to apply the theory and techniques taught in WTC 153 Gas Metal and Flux Cored Arc Welding I. Student will practice basic safety, principles, practices, and applications of GMAW and FCAW in the flat and horizontal positions. Weld problems, corrections and specific techniques will also be practiced in this course. (Co-requisite: WTC 153)	2
WTC 155	Gas Metal and Flux Cored Arc Welding II This course covers the most advanced GMAW/FCAW practices. The concentration will be on vertical and overhead welding techniques conforming to the AWS structural welding code. Weld problems,	1

corrections and specific techniques will be covered in this course.
(*Prerequisite:* WTC 151, WTC 152, WTC 153, WTC 154)

- WTC 156 Gas Metal and Flux Cored Arc Welding II Lab 2**
This course is designed to allow students to apply the theory and techniques taught in WTC 155 Gas Metal and Flux Cored Arc Welding II. Student will practice basic safety, principles, practices, and applications of GMAW and FCAW in the vertical and overhead positions. Weld problems, corrections and specific techniques will also be practiced in this course. (*Prerequisite:* WTC 151, WTC 152, WTC 153, WTC 154; *Co-requisite:* WTC 155)
- WTC 157 Gas Tungsten Arc Welding 2**
This course is designed to teach the student the basic safety, principles, practices, and applications of GTAW. This course covers GTAW welding theory including safety, tool usage, equipment set up and standard terms and definitions. Basic welding techniques using GTAW in the flat, horizontal, vertical and overhead positions will be taught. The course also covers related metallurgy, and how to identify weld problems and defects when using this process. (*Prerequisite:* WTC 151, WTC 152, WTC 153, WTC 154)
- WTC 158 Gas Tungsten Arc Welding Lab 4**
This course is designed to allow students to apply the theory and techniques taught in WTC 157 Gas Tungsten Arc Welding (GTAW). Student will practice basic safety, principles, practices, and applications of GTAW in the flat, horizontal, vertical and overhead positions. Weld problems, corrections and specific techniques will also be practiced in this course. (*Prerequisite:* WTC 151, WTC 152, WTC 153, WTC 154; *Co-requisite:* WTC 157)

CONTINUING EDUCATION

Manufacturing and Industry

CNC Operator 510-hour Certificate
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This 510-hour job training is designed for individuals looking to enter the high demand machining field. The program covers the theory and hands-on practice of conventional CNC lathes & mills. In addition to blueprint reading, and the OSHA 10-hour Safety Training, instruction includes the use of metals and the stresses placed upon them.
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CNC Operator 285-hour Certificate
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This 285-hour program covers the theory and hands-on practice of conventional CNC lathes & mills. In addition to blueprint reading emphasis on the use of metals and the stresses placed upon the metals will be taught.
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Basic Maintenance

This 48-hour training provides introductory, hands-on training that is designed for those individuals who wish to learn home improvement and maintenance skills or those looking to upskill in their current occupation. The class topics include basic plumbing, electrical/wiring, framing, dry wall, and pest control. These skills can also be applied in the industrial setting.

Welding

In partnership with Earlbeck Technologies, Johnson College is a welding training and testing facility.

Fundamentals of Welding (36 hours)

This course provides the foundation on which all of our courses are built. Students learn equipment set-up, basic techniques and safety for oxy-fuel welding and cutting; as well as Stick, TIG and MIG welding. In addition, the course discusses basic metallurgy, welding codes, welding inspection and welding symbols.

Intermediate Stick Welding (54 hours)
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This course provides specific instruction in the Shielded Metal Arc (SMAW) welding process. Students learn how to perform fillet and groove welds on carbon steel using E6010 and E7018 electrodes in all positions. Student practice is geared toward structural welding code vertical and overhead tests. Passing these tests provides an all position, limited thickness, AWS D1.1 welder certification.

Intermediate TIG Welding (48 hours)
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This course provides specific instruction in the Gas Tungsten Arc Welding (GTAW) process. Students will learn how to perform flat, horizontal, and vertical fillet and flat groove welds on carbon steel, stainless steel and aluminum. Student practice is geared toward thin material applications. Included are certification tests to AWS D17.1 Aerospace Code for Carbon Steel, Stainless Steel and Aluminum.

Intermediate MIG Welding (42 hours)

This course provides specific instruction in the Gas Metal Arc (GMAW) and Flux-Cored Arc (FCAW) welding processes. Students will learn how to perform fillet and groove welds in all positions. Student practice is geared toward sheet metal and structural steel welding code vertical and overhead tests. Passing the certification test provides an all-position, limited thickness, AWS D1.1 welder certification in FCAW and vertical D1.3 structural sheet metal code certification in GMAW.

Advanced Welding (48 hours)

This course provides additional instruction to graduates of our Fundamentals and any one Intermediate Welding program or previously certified all position plate welders. This course is geared toward open root pipe welding in all positions and includes a 6G position ASME Pressure Vessel Code test. Advanced classes are available for Stick, MIG or TIG welding.

Certification Testing

Johnson College, in conjunction with Earlbeck Gases & Technologies, is an AWS Accredited Test Facility (ATF). Certification testing is done to a specific code, which is selected based on the application and job requirements. Welding codes are written for a particular industry or product type such as Structural Steel, Sheet Metal, Aluminum or Stainless Steel; Boilers, Pressure Vessels and Piping Systems; Aerospace Welding; and many more. Each of these codes requires a welder to prove they are qualified by passing a Welder Performance Qualification Test. This is a practical exam that tests your ability to make quality welds, and there is no written test for any commonly used code. Testing is held at the Johnson College welding facility by appointment only.

Automotive

Northern Region Emissions Inspector Testing

The Pennsylvania Department of Transportation has developed an online training program for technicians to become certified in the Northern Region PA Vehicle Emissions Inspection and Maintenance (I/M) Program. Johnson College is approved by PennDOT to proctor the emissions testing. *Please note: Only new*

inspectors and inspectors with expired certifications are required to attend a proctored exam.

OBDII Emissions Training

The OBDII computer monitors a vehicle's emission control systems in real-time and is capable of informing a motorist or technician of a systemic issue the moment it occurs. Successful completion of the (OBD/EI) Inspector certification test, allows the inspector to do any emission inspection in Pennsylvania.

Currently that would include Northern Region visual, one speed idle test, two speed idle test, dyno, and OBD tests. The EI class consists of 8 hours classroom instruction followed by a computer based competency exam (CBT) and then a multiple choice exam.

PA State Safety Inspector Training

The course requirements include 12 classroom hours, a written test, and a two-hour tactile test scheduled independently with the instructor. This course covers vehicle body condition, working electronics, fluid leaks, break efficiencies, and more. All must be successfully completed before receiving certification from PennDOT.

OSHA

OSHA 10

This training provides students with an understanding of general industry or construction industry workplace safety and health issues as they relate to OSHA standards, policies and procedures. This training is designed for managers, supervisors and employees. Upon successful completion of the training, attendees will receive an official OSHA General Industry or Construction Outreach Course Completion Card.

OSHA Powered Industrial Truck Operator (Forklift)

The forklift training course is designed to familiarize students with OSHA Powered Industrial Truck Operator Training Requirements (29CFR Standard 1910.178 and ASME B56.1), provide current training requirements under the newly adopted standards and to assist participants in becoming an authorized operator of forklifts through theory and tactile testing. Nine hours of instruction including pre-operational inspection, picking up, traveling and placing loads, parking procedures, and practical operation. Upon successful completion of the training, attendees will receive an official OSHA Powered Industrial Truck Operator Card.

Healthcare

Medical Assistant (MA)

The Medical Assistant program is a 260-hour program that is completed over nine months. The program follows the National Health Association curriculum. The course covers Anatomy & Physiology, Medical Terminology, and Clinical Skills. This in-person training provides hands-on instruction and practice designed to achieve competency. At the completion of the program students are eligible to sit for the proctored Certified Clinical Medical Assistant (CCMA) testing.

MRI/CT Scan

The Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) Technologist Certificate online training programs are designed to provide registered radiological technologists with the necessary knowledge of MRI or CT along with the related clinical competencies to be eligible to sit for the national certification examination offered by the American Registry of Radiologic Technologists (ARRT).

Computer

Auto CAD (Computer Aid Design)

This course is an introductory course into Computer-Assisted Drafting. CAD software is used to increase the productivity of the designer, improve the quality of design, improve communications through documentation, and to create a database for manufacturing. This course explains basic CAD commands required to produce working drawings. Students will work with creating 2D objects, text usage, dimensioning, layer management, model/paper space, and plotting.

Revit Basics

This course is an introductory course into Revit software. The software is used by architects, landscape architects, structural engineers, mechanical, electrical, and plumbing engineers, designers and contractors. This course explains the basic program interface, creating/manipulating levels, model creation, working with walls/roofs/windows, dimensions, and building sections.

Computer Support & Security Specialist

This program prepares students for a role in supporting computer users by installing, configuring, troubleshooting, and managing computers, hardware, wired and wireless networks. Upon completing this course, students will be able to support the IT infrastructure through installing and configuring systems to secure applications, networks, and devices as well as perform threat analysis and

respond with appropriate mitigation techniques allowing end users to connect to the data they need in order to do their jobs regardless of the devices being used. The program also prepares students to support the IT infrastructure through installing and configuring systems to secure applications, networks, and devices as well as perform threat analysis and respond with appropriate mitigation techniques.

Online Training

In conjunction with a well-known online-learning platform host, the Continuing Education department offers a diverse multitude of short-term, non-credit training. Such online training includes your choice of Healthcare; Software, IT & Web Development; Skilled Trades & Technology; Business; Management & Accounting; and Project Management & Quality Assurance. If necessary to the selected program, hard copy materials will be shipped to you at your address and access to all electronic content accompanies your eLearning program access. Learners have unlimited access to technical and program support through the training host's network of student mentors and instructor resources. Although not required to successfully complete your program, the goal of most of these programs is to prepare students for nationally-recognized certification.

Specialized/Customized Industry Training

Johnson College and the department of Continuing Education take pride in collaborating with local industries to develop specialized instruction designed to assist those local employers with upskilling their current or anticipated workforce. Johnson College and industry leaders will work side-by-side in determining and developing the topics needed that will culminate in a structured training program designed to meet and exceed expectations.

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B.A., Goldey-Beacom College

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B.S., Marywood University

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A.S. Degree

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A.S., Johnson College

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B.S., Keystone College
A.S., Johnson College

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DPT, Arcadia University
M.S., University of Scranton
B.S., University of Scranton

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Physical Therapist Assistant**

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A.A.S., The Pennsylvania State University

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M.Ed., American College of Education
B.S., Misericordia University
A.A.S., Broome Community College
American Registry of Radiologic Technologists

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Clinical Coordinator / Instructor**

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M.Ed., American College of Education
B.S., Misericordia University
American Registry of Radiologic Technologists

**Radiologic Technology
Clinical Instructor**

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B.S. Southern New Hampshire University (2023)
A.S., Johnson College
American Registry of Radiologic Technologists

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B.S., Rochester Institute of Technology

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A.S., Johnson College

Veterinary Nursing Instructor

Amanda Melnyk, CVT
A.S., Johnson College

Admin. Coordinator for Veterinary Nursing

LoriAnn Benner

A.A.S. Degree

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Architectural Drafting & Design
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Mechanical Design Cert., Penn Foster

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Baron Institute of Technology
CTE- Level 1

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Mark Chappell
A.S.T., Johnson College

Trades Instructor

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A.A.S., Johnson College

Academic Certificate

Welding Program Director

Anthony Delucca

Certified Welding Instructor / Educator (CWI/CWE)

Certificate, Welder Training and Testing Institute

Motorcycle Fabrication Certificate

AWS D1.1 Certified Welder

Welding Instructor

Benjamin Lipperini

B.A., Keystone College

Certified Welder, Johnson College

Welding Instructor

Joshua Perniciaro

Certified Welder, Johnson College

Core Course Faculty

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B.A., Saint Vincent College

Post-Masters Certificate in Education, Capella University

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Laura Romanovich

M.S., University of New England

B.S., University of Scranton

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B.A., Kings College

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Campus Manager, Hazleton

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B.S., Drexel university

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Denise Boyle
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Student Financial Services Counselor

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M.A., Cornerstone University
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Technology Support Specialist

Michael Zangardi
A.S., Johnson College

Interim Director of Financial Aid (interim)

Jill Barnhart