

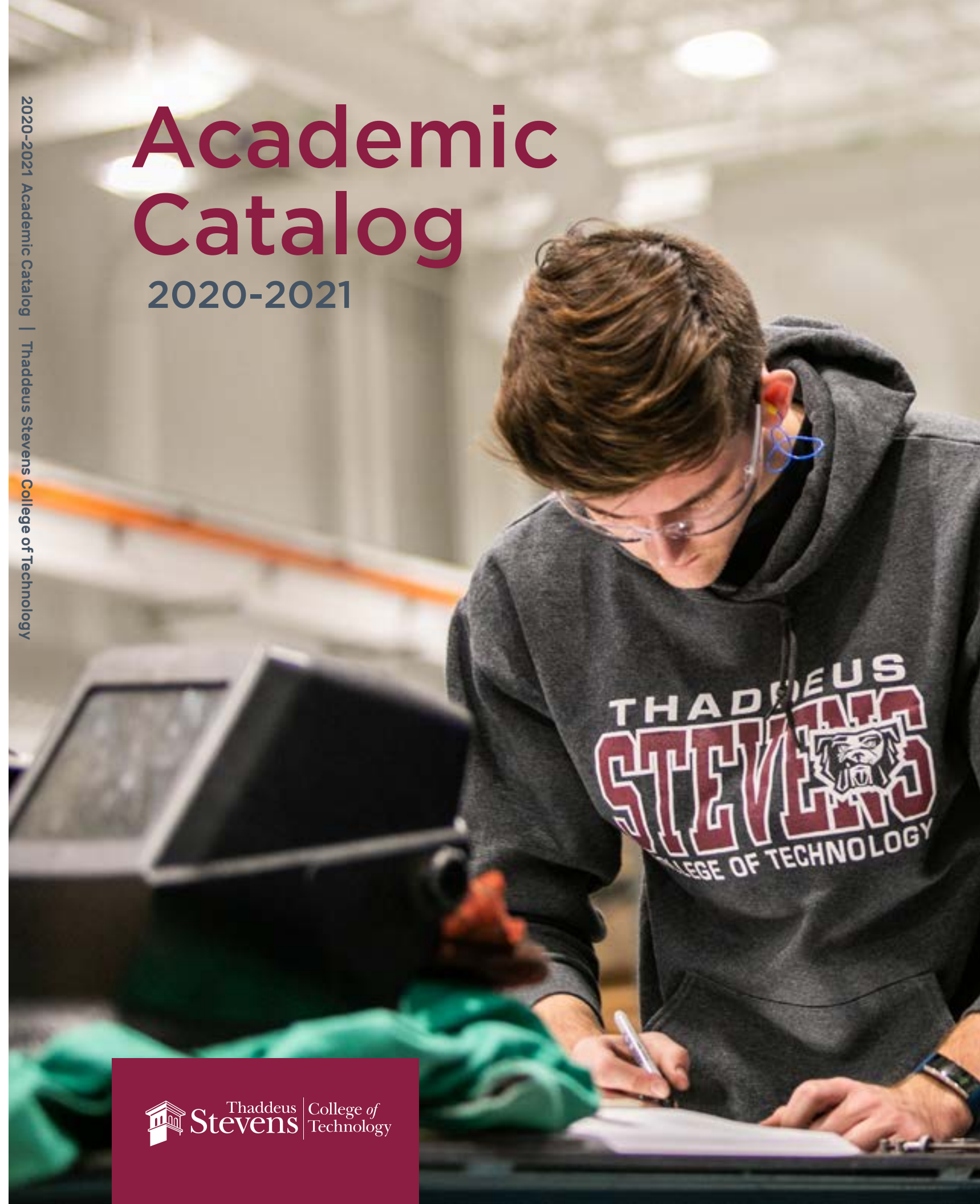
Academic Catalog

2020-2021



www.StevensCollege.edu

750 East King Street
Lancaster, PA 17602



Welcome



Thaddeus Stevens College of Technology has been changing the lives of students for over 100 years. Stevens provides a well-rounded, two-year education that virtually guarantees a good job and the opportunity for a better life. While most students select one of several job offers upon graduation, some choose to further their education. Accredited by the Middle States Commission on Higher Education, Stevens College offers Associate Degrees and one-year certificates in range of technical majors.

Stevens is unique in many ways. Few two-year colleges have on-campus housing or offer a full range of intercollegiate athletics. We also offer full scholarships to over one-half of our students based upon their financial need.

One of Stevens' many strengths is its diversity: ethnically, racially, socio-economically, and academically. Males and females of all ages attend Stevens. This diversity, ever reflective of society's work place, is a valuable component of our students' education.

Stevens College consists of 20 buildings located on a beautiful and historic 32.5-acre tree-lined campus and three auxiliary campuses with the opening of its new Greiner Advanced Manufacturing Center. The Learning Resource Center, which includes the library, is a state-of-the-art facility with computer learning stations and full Internet access. The College's Orange Street location is located five blocks from the main campus and includes dormitory rooms and program classrooms and laboratories. All of the facilities are well-maintained with contemporary equipment and technology.

Stevens' strength goes well beyond its grounds, buildings, and technology. Its strength lies in its highly qualified and dedicated faculty and support staff. These people, with their real-world experience, genuine concern for students, and hands-on approach to education, are what make Stevens different from any other institution. They're responsible for the high success rate of our students.

Are you interested in a total college experience that results in immediate employment and a bright career? Then we encourage you to visit our web site at www.stevenscollege.edu to look at the many programs we offer, our college videos, and online application. Contact our admissions office for more information at 1-800-842-3832.

Mission Statement

Thaddeus Stevens College of Technology educates Pennsylvania's economically and socially disadvantaged as well as other qualified students for skilled employment in a diverse, ever-changing workforce and for full, effective participation as citizens.

Vision Statement

Thaddeus Stevens College of Technology will be the best two-year technical college of its kind by adding value to the lives of our students so that they will find skilled employment, be effective citizens, and reach their full potential.

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Note to Students

Disclaimer

The College's Catalog sets forth the full range of options that would generally apply in a normal school year. Since the College's curricula, programs, and policies cannot be static in a changing environment, the information in this catalog is subject to change by the College at any time.

Accordingly, neither this catalog nor any parts of it may be relied upon as a contract between any student or group of students and the College. The College may reproduce or modify this catalog, or parts of it, for distribution in other formats (for example, in other formats for computer access, or in college, school, or academic department publications). As a result, students, applicants, and other users of this catalog should consult with appropriate College Offices to verify the current text or status of policies, programs, descriptions of curricula, or other information in this catalog.

COVID Notice

It should be noted that because of the impact of COVID-19, course offerings, programs, policies, practices or the College's delivery of education may change from that which is reflected in the Catalog. If those changes are implemented, they will be implemented only because of the need for the College to follow guidelines issued by federal and state governmental authorities and because of the College's desire to provide for the health and safety of its students, staff and employees. The College will endeavor to provide as much advance notice as is possible to all students, staff and employees of any changes, additions or alterations to the College's course offerings, programs, policies, practices or the College's delivery of education.



Thaddeus Stevens' Legacy

Growing Up

Thaddeus Stevens was born in Danville, Vermont, on April 4, 1792. He was the second of four boys whose parents were Sarah and Joshua Stevens. Thaddeus' older brother Joshua was born with two clubfeet that made it very difficult for him to walk. In the late 1700s, any physical deformity was seen as a sign from God that the family had committed some serious secret sin. Such a deformity was called the mark of the devil, and as a consequence, the Stevens family was ridiculed and shunned. Then Thaddeus was also born with a clubfoot, which made things even worse for the family.

Joshua Stevens was an alcoholic and abusive man with a special talent for staying poor. The family lived in abject poverty on a small farm. By the time Thaddeus was 12, his father had abandoned the family and later was killed in the War of 1812.

Sarah Stevens was a kind woman with great energy, a strong will, and a deep religious faith. She held the family together by working day and night every day. In addition to doing the farm work, she cleaned and performed other domestic work for people in the area. Thaddeus loved his mother and was totally devoted to her throughout his life. Sarah realized that the only hope for her eldest two sons was education. She scraped enough money together to enroll them in the nearby one-room Peacham School. In addition to a severe limp due to his clubfoot, Thaddeus was frail, poor, and not particularly attractive. Consequently, he was teased and taunted mercilessly by other children throughout his childhood. He became very shy and was extremely sensitive. Thaddeus excelled in school, however, it became obvious that he had great intelligence and a special aptitude for debating. Upon completion of his education at Peacham, Thaddeus was accepted at Dartmouth College. He was the

poorest student at the College, never having enough money for books, let alone money to go out and socialize with his rich classmates. As a result, he was an outcast—just as he had been throughout his childhood. Even though he was more qualified than most of his peers, he was not nominated for Phi Beta Kappa, an honors fraternity. This insult left him very hurt and bitter.

Thaddeus Stevens graduated from Dartmouth and accepted a teaching position at a one-room school in York, Pennsylvania. He studied law in the evenings and passed the bar exam in a year. He set up practice in Gettysburg and later moved to Lancaster. He became an instant success. In his first year, he successfully argued nine out of ten cases before the Pennsylvania Supreme Court, an unprecedented feat. Word of his ability and success spread throughout the region, and he was inundated with clients. After five years, he owned a house and lot, along with several other properties, and he was able to purchase his mother a 250-acre farm with 14 cows. He said that buying her the farm was the “greatest satisfaction of his life.” During the next 21 years, he would become very wealthy and known as an excellent attorney, renegade politician, and philanthropist.





A Life of Service

In 1833, Thaddeus Stevens was elected to the Pennsylvania House of Representatives. He did not run as a democrat, the party that dominated Pennsylvania politics, but rather as an anti-Mason, a political party that opposed Free Masons or Masonry. Free Masons included many of the most influential and prestigious men, including George Washington. Anti-Masons opposed Freemasonry because of its secrecy, oaths, and religious pageantry. Stevens objected to it because of his personal hatred of exclusionary clubs and societies and because some chapters' charters excluded "cripples."

During his time in the General Assembly, the accomplishment Thaddeus Stevens was most proud of was his effort to institute free public education. In 1830's America, there were practically no free public schools. Those that existed were found in New England and in large cities. Only affluent families could afford to send their children to school. In a few places, poor children could attend school if their parents would publicly admit poverty; however, this was very rare. When the Free School Bill was introduced in the Pennsylvania House of Representatives, Stevens became an ardent supporter. He collaborated with Governor Wolfe to get the Bill passed, even though Wolfe was a Mason. Unfortunately, when legislators returned to their districts, there was an uproar. People believed free education was too expensive, and some opposed the Bill because they had their own religious schools. Over 32,000 individuals signed a petition to repeal the new legislation. The General Assembly was recalled and went into session to reconsider. The Senate quickly passed a Repeal Bill which then went to the House. Stevens took the floor to defend the original bill. There was standing room only as most of the Senate filled the gallery. Stevens began his speech by using statistics to show how a state system of free schools was more efficient and ultimately less costly than the existing system. He said the repeal act should be called, "An act for branding and marking the poor, so that they may be known from the rich and the proud." He went on:

"I know how large a portion of the community can scarcely feel any sympathy with, or understand the necessities of the poor; the rich appreciate the exquisite feelings which they enjoy, when they see their children receiving the boon of education, and rising in intellectual superiority above the clogs which hereditary poverty had cast upon them.... When I reflect how apt hereditary wealth, hereditary influence, and perhaps as a consequence, hereditary pride, are to close the avenues and steel the heart against the wants and rights of the poor, I am induced to thank my Creator for having, from early life, bestowed upon me the blessing of poverty."

He urged the legislators to ignore the misguided petitions and to lead their people as philosophers, with courage and benevolence.

After he finished, he limped back to his seat to the cheers of the entire assembly. The House suspended the rules and amended the Repeal Bill into an act that actually strengthened the original Free School Act and passed it. The Senate immediately followed suit. The result was to give Pennsylvania a statewide free public school system an entire generation before New York, New Jersey, Connecticut, Rhode Island, and the entire South. This is why Stevens is referred to as the savior of free public education in Pennsylvania, and why the Commonwealth created Thaddeus Stevens College of Technology as a tribute to Thaddeus Stevens.

This is another example of Stevens drawing from his own background and experience to attack privilege based on anything other than merit. Also, this instance reflects his fundamental belief that education is the great equalizer. He later said that if education is inexpensive and honorable, people with intelligence, no matter how poor, would utilize it to improve themselves.

An important part of Thaddeus Stevens' legacy is his philanthropy. Throughout his life, he could never recall the poverty and discrimination of his childhood without great pain which sensitized him to the oppression and human suffering in the world. He simply could not bear to hear or see suffering if his money or legal aid could relieve it. He gave of them both almost without limit. He did this irrespective of race, religion, national origin, or political affiliation. Even his harshest critics said he was charitable, kind, and lavish with his money in the relief of poverty. He had standing orders with his physician and cobbler to treat all deformed and disabled children at his expense. It is impossible to estimate how much money he gave to the poor and needy or the value of the legal services he provided for free. One indicator was that at the time of his death, he had over \$100,000 in notes from individuals to whom he had loaned money and from whom he had never been repaid. In his will, he left \$50,000 to establish a school for the relief and refuge of homeless, indigent orphans. This original bequest has evolved into Thaddeus Stevens College of Technology. His will stated the following:

"They shall be carefully educated in the various branches of English education and all industrial trades and pursuits. No preference shall be shown on account of race or color in their admission or treatment. Neither poor Germans, Irish or Mahometan, nor any others on account their race or religion of their parents, shall be excluded. They shall be fed at the same table."

He defended and supported Indians, Seventh Day Adventists, Mormons, Jews, Chinese, and women. However, the defense of runaway or fugitive slaves gradually began to consume the greatest amount of his time, until the abolition of slavery became his primary political and personal focus. He was actively involved in the Underground Railroad, assisting runaway slaves to get to Canada, sometimes as many as 16 a week.

Radical Change

Thaddeus Stevens was elected to the United States House of Representatives from 1849–1853 and from 1859 until his death in 1868. This was the period leading up to and including the Civil War and the beginning of Reconstruction. During this time, Stevens became the most powerful congressman in Washington. He chaired the House Ways and Means Committee and later the Appropriations Committee. He was responsible for funding the war effort and later Reconstruction. His goals during this period were the following: (1) to abolish slavery; (2) to accord individuals full legal rights irrespective of race; (3) to accord individuals voting rights irrespective of race; (4) to empower African Americans in the South by redistributing power and wealth as a result of the Reconstruction.



Stevens' legislative legacy is the 13th, 14th, and 15th Amendments to the Constitution, which serve as the basis for all civil rights legislation.

Stevens drafted his own version of the 13th Amendment, but when it failed to gain support, he shepherded a more popular version through Congress. It ended slavery in all states, whereas the Emancipation Proclamation only abolished slavery in the Confederacy.

Stevens also guided the 14th Amendment through Congress. This amendment established a national citizenry with all citizens given equality before the law, which no state could alter. He was disappointed because the amendment still made references to males only, allowed states to restrict voting rights based on race, and allowed Confederates to vote.

Stevens' disappointment in the shortcomings of the 14th Amendment, however, paled in comparison to his outrage over the failure of Reconstruction at the end of the Civil War. He wanted the wealthy white political power structure of the South to be dismantled and redistributed and proposed that every black free man should receive 40 acres and a mule and that Confederates should not be allowed to vote immediately. Unfortunately, any chance of Stevens' vision becoming a reality was lost when Abraham Lincoln was assassinated, and Andrew Johnson, the Vice President, became President.

Johnson's views about the nature of Reconstruction caused Stevens to despise Johnson and he worked to impeach him. The final vote fell one vote short, but Johnson was permanently weakened and reduced to a figurehead for the rest of his term, being replaced by Ulysses Grant in 1868.

In My Death...

Thaddeus Stevens died at Midnight on August 11th, 1868. The public expression of grief in Washington was second only to Lincoln's. His coffin lay in State at the Capitol Rotunda, flanked by a Black Union Honor Guard of Massachusetts. 20,000 people, half of who were black free men, attended his funeral in Lancaster. He chose to be buried in the Schreiner-Concord Cemetery because it was the only cemetery that would accept all races. He wrote the inscription on this headstone that reads:

"I repose in this quiet and secluded spot, not from any natural preference for solitude, but finding other cemeteries limited as to race, by charter rules, I have chosen this that I might illustrate in my death the principles which I advocated through a long life, equality of man before his Creator."

Stevens dreamed of a socially just world, where unearned privilege did not exist. He understood from his own experience that being different or having a different perspective can enrich society. He knew that differences among people should not be feared but celebrated. Thaddeus Stevens College of Technology is a living monument to its founder's legacy. As such, the College continually strives to provide under privileged individuals with opportunities and to create an environment in which individual differences are valued and nurtured.



Quick Facts

Location

Thaddeus Stevens College is located in southeastern Pennsylvania in Lancaster, about 71 miles west of Philadelphia and 38 miles east of Harrisburg. The campus is a few blocks from downtown Lancaster. The greater Lancaster area includes over 450,000 inhabitants and offers many athletic, cultural, and social activities.

Ownership

Thaddeus Stevens College of Technology is owned by the Commonwealth of Pennsylvania.

Instructional Facilities

The 25 buildings comprising the Thaddeus Stevens College campus are situated on a 32.5-acre tract of land located at the eastern edge of the city of Lancaster along with additional locations close by. The main campus includes five residence halls, a dining hall and multiple technical laboratory facilities, classrooms and the Learning Resource Center. In addition, the Multipurpose Activity Center—with 3 NCAA-sized basketball courts, large fitness center, racquetball courts, an indoor track, and an athletic field with an outdoor track—and the Student Center are available for student use. Additional programs of study reside at Thaddeus Stevens on Orange, the Greiner Advanced Manufacturing Center and the Greenfield location.

Cost

The tuition and room/board costs are provided in the admissions section of this catalog. Many students receive full grants based on financial need.

Student Population

Co-ed, 1100-1200 students.

Calendar

Classes begin in late August and end in early May each scholastic year; semesters consist of 16 weeks of instruction. Summer sessions are held from May through August for Pre-Major and general education courses.

Placement Rate

Over 97%, with 100% in some programs.

Job Placement Assistance

Available free of charge to all students. Includes assistance in obtaining part-time jobs on and off campus, full-time summer employment, and full-time employment upon graduation.

Housing

Five residence halls including dormitory space in Thaddeus Stevens On Orange. Off-campus housing is usually available near the College. The Residence Life Office has further information on housing.

Food

Meals are served in Jones Dining Hall during the fall and spring semesters according to the following schedule:

Monday through Friday

Continental breakfast:	6:45–7:00 am
Hot breakfast:	7:00–7:30 am
Coffee break	9:00–9:30 am
Lunch:	10:45 am–1:00 pm
Coffee break	2:00–2:30 pm
Dinner	5:00–6:30 pm

Weekends and Holidays

Brunch	10:30 am–12:00 pm
Dinner	4:30–5:00 pm

Vending machines are also placed around the campus.

Bulldog Café I and Bulldog Café II

Students always have the opportunity of enjoying a meal, to include breakfast, or just a quick snack from one of two Bulldog Cafés. Bulldog Café I is located on the first floor of the Schwalm Student Center. Bulldog Café II is located adjacent to the Main Lobby at Thaddeus Stevens On Orange.

Student Organizations

Student Congress, residence hall councils, student representatives on all College standing committees, American Design Drafting Association, American Institute of Architectural Students, Black Student Union, Boxing Club, Building Industry Association, Latino Scholars Alliance, Outdoors Club, Phi Theta Kappa, Powerlifting, Power Source, Society of Manufacturing Engineers, Spectrum, Tech Phi Tech, SkillsUSA, and Women in Tech and Trades.

Athletics

Intercollegiate basketball, football, cross country, track and field, and wrestling. The College also has intramural programs.

The Dean's List

The Dean's List is an honor roll of all students enrolled in 12 credit-bearing courses who have a semester GPA of 3.25 or better. The list is compiled at the end of each semester.

Industry Advisory Committees

Thaddeus Stevens College relies on the services of 23 technical program advisory committees. The committees meet periodically with the administration and staff to consult about program standards, curriculum content, instructional methods, placement, and equipment selection.

The Purpose, Philosophy, and Programs of Thaddeus Stevens

The Purpose of Thaddeus Stevens College

Thaddeus Stevens College of Technology seeks to fulfil its mission and philosophy by providing the following:

- Technical programs that integrate theory and hands-on training to prepare students for skilled employment or transfer to other colleges
- General education courses that integrate communications, math, science, technology, humanities, interpersonal skills, reasoning, and physical health
- Pre-Major program and services to assist students in meeting the requirements to enter and succeed in their college-level coursework
- Enriched curriculum opportunities through internships, community projects, service-learning, and partnerships with business and industry
- A dedicated faculty and staff who are committed to student success
- Technology and information resources necessary for students to achieve their educational and career goals
- Opportunities that contribute to the educational, career, social, cultural, recreational, and personal development of each student
- A campus environment that fosters self-development, citizenship, and democratic ideals
- Needs-based grants to qualified students

The Philosophy of Thaddeus Stevens College

Thaddeus Stevens College of Technology is dedicated to the principles of its benefactor, Thaddeus Stevens, who believed in the dignity, civil rights, and value of each human being regardless of race, sex, religion, or heritage. We believe in the worth and potential of each student and the importance of each in a democratic society.

The Core Values of Thaddeus Stevens College

Thaddeus Stevens College of Technology is committed to structuring and maintaining its daily functions around the following core values: Integrity, diversity, respect, teamwork, learning and growth, and accountability.

Integrity: We value the commitment to high moral/ethical standards, honesty, and fairness in teaching and learning, social engagements, and professional practices.

Diversity: We value the recognition of the variety of unique individuals within our world and the interdependence upon each other, each other's culture, and the natural environment. We value the differences and respect the qualities and experiences that are different from our own.

Respect: We value the unbiased consideration, treatment, and regard for the rights, values, beliefs, and property of all other people.

Teamwork (Collaboration): We value working cooperatively and collaboratively as part of a group in which there is a shared mission and vision aligned toward a goal.

Learning and Growth (Life-Long Learning): We value the relentless dedication to increasing the knowledge and competencies of all individuals associated with the College. We recognize that human resources are the College's only sustainable competitive advantage.

Accountability: We value the taking of responsibility for actions and the results of those actions; honoring obligations, expectations, and requirements; delivering what is promised; and owning up to shortcomings and mistakes.

Institutional Learning Goals

The Thaddeus Stevens College community stimulates and measures student achievement through internal and external evidence-based metrics aligned to and with our institutional learning goals: Mastery of content, effective communication, mathematical reasoning, critical thinking, and leadership.

Mastery of Content: Students will exhibit career readiness by demonstrating the critical knowledge and skills required in professional and/or collegiate endeavors.

Effective Communication: Students will read, write, speak, and listen to achieve literal and/or inferential understanding.

Mathematical Reasoning: Students will apply mathematical methods and concepts to solve problems and make informed decisions.

Critical Thinking: Students will build upon acquired comprehension by employing higher order thinking skills when questioning current situations, posing an alternative, objectively resolving problems, and/ or applying prior knowledge and processes to new situations.

Civic Engagement: Students will develop an appreciation for the value of community through service opportunities.

Technological Competency: Students will demonstrate technical knowledge and practical application.

Accountability

Middle States Commission on Higher Education
Accreditation: Thaddeus Stevens College of Technology has received and maintained its accreditation through the Middle States Commission on Higher Education (MSCHE or Middle States) since 1991. The Middle States Commission on Higher Education is a voluntary, nongovernmental, membership association that defines, maintains, and promotes educational excellence across institutions with diverse missions, student populations, and resources. Additional information can be found in the publication, Standards for Accreditation and Requirements of Affiliation (<http://www.msche.org/>).

Programs

Two-year technical programs in the following areas lead to an associate degree:

- Architectural Technology
- Automotive Technology
- Business Administration
- Cabinetmaking and Wood Technology
- Carpentry Technology
- Collision Repair Technology
- Computer and Network Systems Administration
- Computer Software Engineering Technology
- Computer-Integrated Machining
- Electrical Technology
- Electro-Mechanical Technology
- Electronic Engineering Technology
- Engineering CAD Technology
- Graphic Communications and Printing Technology
- Heating, Ventilation and Air Conditioning-Refrigeration
- Masonry Construction Technology
- Mechanical Engineering Technology
- Metalcasting Technology and Manufacturing Management
- Metals Fabrication and Welding Technology
- Plumbing Technology
- Residential Remodeling
- Water and Environmental Technology
- Welding Technology

Nine-month technical programs in the following areas lead to a certificate:

- Electrical Construction & Maintenance Certificate
- Computer-Integrated Machining Certificate
- Masonry Construction Certificate
- Welding Technology Certificate

Board of Trustees

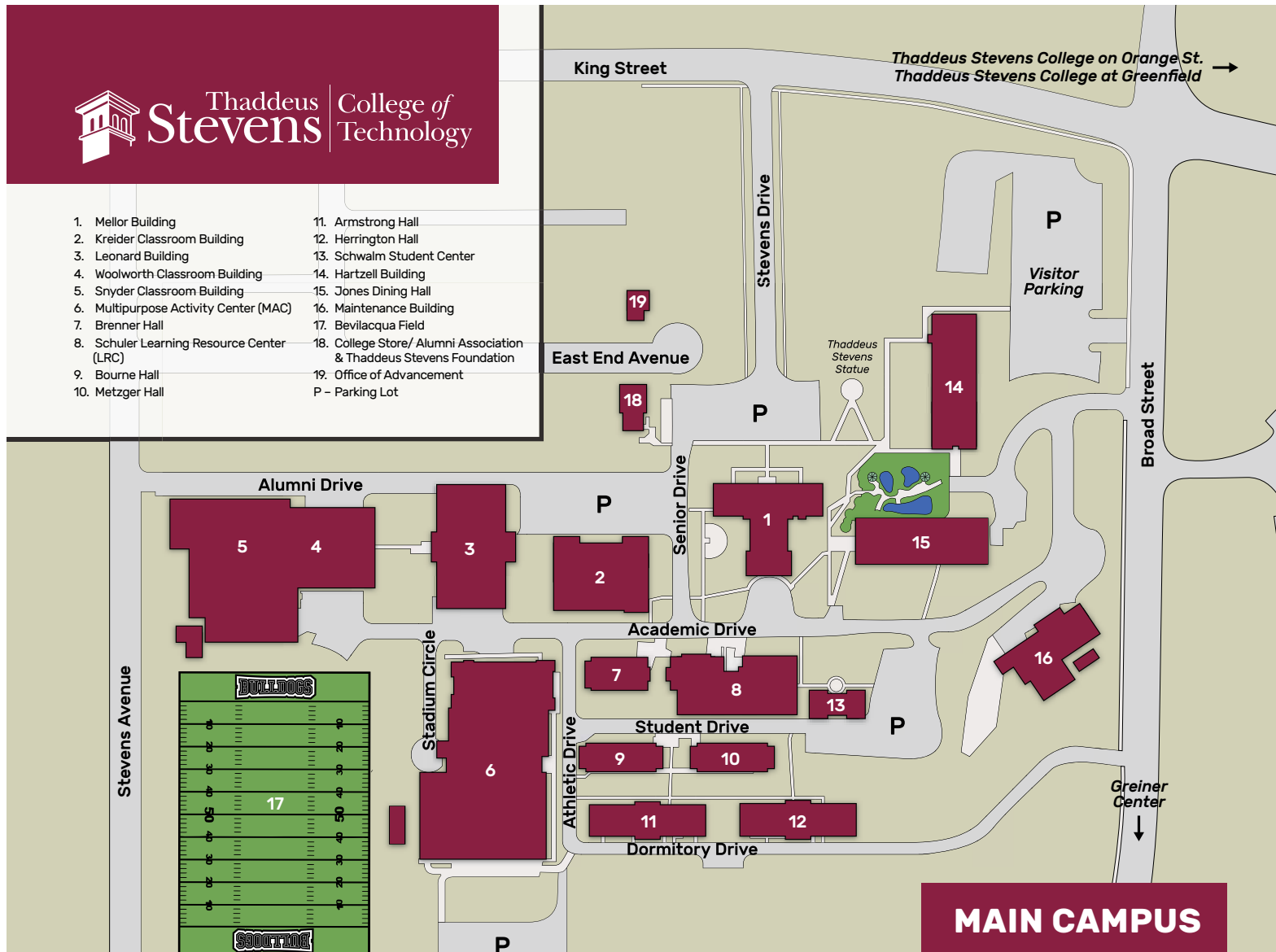
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Thaddeus Stevens College of Technology

- | | |
|---|---|
| 1. Mellor Building | 11. Armstrong Hall |
| 2. Kreider Classroom Building | 12. Herrington Hall |
| 3. Leonard Building | 13. Schwalm Student Center |
| 4. Woolworth Classroom Building | 14. Hartzell Building |
| 5. Snyder Classroom Building | 15. Jones Dining Hall |
| 6. Multipurpose Activity Center (MAC) | 16. Maintenance Building |
| 7. Brenner Hall | 17. Bevilacqua Field |
| 8. Schuler Learning Resource Center (LRC) | 18. College Store/ Alumni Association & Thaddeus Stevens Foundation |
| 9. Bourne Hall | 19. Office of Advancement |
| 10. Metzger Hall | P - Parking Lot |



Main Campus

750 East King Street

Automotive Technology
Cabinetmaking and Wood Technology
Carpentry Technology
Collision Repair Technology
Computer & Network Systems Admin.
Electrical Technology
Electro Mechanical Technology
Electronic Engineering Technology
Plumbing Technology

Greiner Advanced Manufacturing Center

599 Chesapeake Street

Computer Integrated Machining
Heating, Ventilation, Air Conditioning/Refrigeration
Metals Fabrication and Welding Technology

Thaddeus Stevens College on Orange St.

1100 East Orange Street

Architectural Technology
Business Administration
Electrical Construction & Maintenance
Engineering CAD Technology
Graphic Communications and Printing Technology
Mechanical Engineering Technology
Metalcasting Technology & Manufacturing Management
Residential Remodeling Technology
Water and Environmental Technology

Thaddeus Stevens College at Greenfield

1812 Colonial Village Lane

Computer Software Engineering Technology
Masonry Construction Technology
Welding Technology

Programs of Study



Architectural Technology

What is Architectural Technology?

The profession of architecture touches everyone's life and is central to solving problems in the creation of a built environment. Architectural technicians are problem solvers who work with clients on the design of buildings. They also create plans and specifications that direct the construction of a building and coordinate the work of other professional consultants and engineers.

Managing information and responding to the many diverse requirements of governments, building conditions, and society is increasingly important in the construction industry. The architectural profession is rapidly integrating the technology of computers and automation to assist in the management of information and to free up time for creative work.

The instruction in Architectural Technology at Thaddeus Stevens College prepares students to become qualified for employment in the architectural profession and to transfer into architectural programs in nationally-accredited universities. The instruction also provides retraining in technological applications for people currently employed in or reentering the profession.

High school prerequisites for this program are Algebra I & II and a GPA of at least 2.5.

A Graduate of this Program Will be Able to:

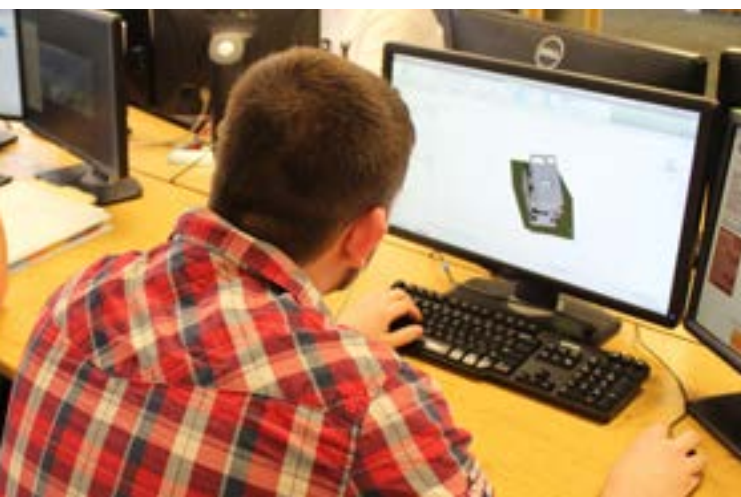
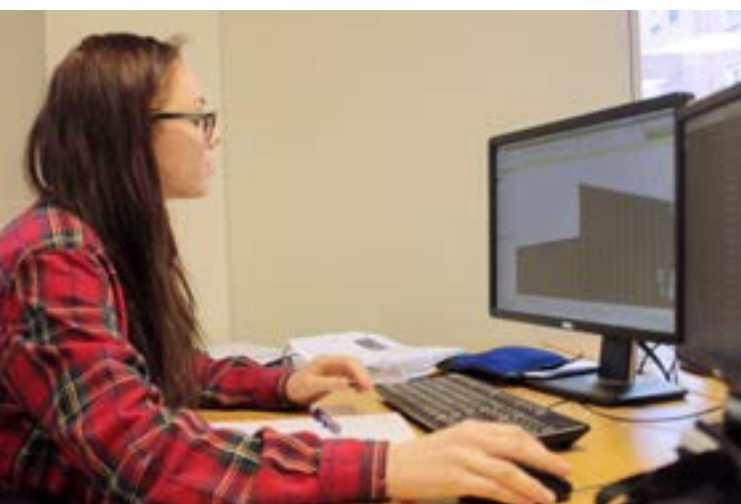
- Demonstrate knowledge of architectural presentation skills including perspective, rendering, and illustration.
- Demonstrate skill in freehand drafting, instrument drafting, and sketching.
- Demonstrate knowledge of building structure, materials, and construction methods.
- Demonstrate knowledge of mechanical, electrical, and plumbing building systems.
- Demonstrate knowledge of basic architectural design and building code principles for residential and small commercial projects.
- Apply mathematical skills necessary for architectural technology.
- Apply CAD to architectural design and drafting problems.
- Explain professional architectural practice.
- Demonstrate knowledge of site planning and design.
- Demonstrate knowledge of architectural terminology.
- Demonstrate oral, written, and visual communication skills.

James E. Hamrick, Professor

BA: University of Cincinnati
 Registered Architect
 Member of American Institute of Architects (AIA)
 Certified Construction Specifier (CCS)

Tedd R. Williams, Instructor

BS: Eastern Mennonite University
 AAS: Thaddeus Stevens College of Technology
 PA L&I: Uniform Construction Code Certification ICC:
 Accessibility Inspector/Plans Examiner Autodesk:
 AutoCAD Certified Professional



Model Schedule For Architectural Technology

Semester 1

ARCH 106: Fundamentals of Architectural Drafting	3
ARCH 111: Material of Construction	3
ARCH 116: Residential Details	3
*ARCH 122: AutoCAD Architecture	2
*ARCH 123: Building Information Modeling	2
†^MATH 137: Intermediate Algebra (or higher)	3
CIS 111: Intro to Computer Applications	3

Semester 2

ARCH 156: Specifications, Estimating, and Contracts	2
ARCH 161: Working Drawings	4
*ARCH 166: Rendering and Illustrations	2
*ARCH 172: Advanced Computer-Aided Drafting (CAD)	3
*MATH 141: Trigonometry (or higher)	3
ENG 106: English Composition	3

Semester 3

*ARCH 206: Advanced Methods and Materials of Construction	4
ARCH 211: Structural Systems	2
ARCH 216: Site and Microclimate Design	3
*PHYS 113: Statics	3
*ENG 216: Technical Writing	3

Semester 4

ARCH 256: Environmental Systems	2
ARCH 261: Life Safety and Building Codes	2
ARCH 266: Architectural History and Theories of Design	1
ARCH 271: Individual Design Studio	4
ARCH 276: Group Design Studio	2
Humanities Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
General Studies Elective	3

TOTAL CREDITS **69**

** Prerequisite or Co-requisite Required. See Course Description.*

† Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 137 and MATH 141, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

^ Minimum Grade Required. See Course Description.

Architectural Technology (ARCH)

ARCH 106 (3 credits)

Fundamentals of Architectural Design

Serves as an introduction to architectural drafting. Focuses on communication of design concepts and instructions to builders. Investigation and analysis of drawings and other means to communicate architecture. Exploration and development of an individual's communication of ideas and thoughts by means of graphic representation.

ARCH 111 (3 credits)

Materials of Construction

Presents fundamental aspects of the design profession. Involves the application and technology of materials. An appreciation of the limits and the potential of materials is fundamental to well-executed designs. Investigation and analysis of actual materials and their application as a means to give form and substance to creative ideas.

ARCH 116 (3 credits)

Residential Details

Research of specific building elements necessary for construction. Application of knowledge and creativity in the development of details. Typical and standard details applicable to residential construction. Learning how to communicate with the construction crew. Involves sketch details and drafted details. Also requires drawings and exercises showing typical details and drafting skills.

ARCH 122 (2 credits)

AutoCAD Architecture

Intensive introduction to CAD including computer literacy, hardware, software, input, output, printing, introductory computer drafting skills, and completion of specific drawing exercises. Instruction is based on current Autodesk® Architecture® (the industry standard software program). Use of CAD to draw architectural elements such as floor plans, lighting, furniture, wall treatments, and other related elements.
Co-requisite: ARCH 123

ARCH 123 (2 credits)

Building Information Modeling

Course teaches students to design and construct using building information modeling (BIM) methodology. BIM employs the concept of parametric modeling by assigning information to three-dimensional objects and automatically updating building components as the model changes or evolves. Using BIM, students generate orthographic drawings and supporting documentation, which may include specifications, schedules, cost management, etc. BIM provides continuous and immediate feedback for students. Through this course, students will become competent in using BIM as a new and efficient way for multi-disciplines to work collaboratively. The software used for this course is Autodesk® Revit®.
Co-requisite: ARCH 122

ARCH 156 (2 credits)

Specifications, Estimating, and Contracts

Introduction to three important aspects of architectural technology: Construction specifications, estimating, and design services contracts. Students learn about the differences between residential, commercial, and federal specifications. The basics of cost estimating for construction is also incorporated, along with simple cost estimates using calculators and computers. Students learn about the provisions that make up typical design services and construction contracts, the legal language, the link between contracts, government regulations, and working drawings.

ARCH 161 (4 credits)

Working Drawings

Students design their own houses in this capstone course, creating a complete set of working drawings including site plans, floor plans, elevations, building sections, wall sections, details, and schedules. Students prepare preliminary presentation drawings; create a presentation model and a structural model; and prepare a full set of working drawings. CAD is used to prepare all drawings.

ARCH 166 (2 credits)

Rendering and Illustrations

Students learn how to use perspective, color, shadow, and computer-aided animation and rendering to illustrate architectural design. Work in this course builds on skills explored in previous courses.

Prerequisite: ARCH 106

ARCH 172 (3 credits)

Advanced Computer-Aided Drafting (CAD)

An intensive follow-up to ARCH 122 and 123, this course uses AutoCAD® for efficient production of architectural drawings. Completes the development of a solid foundation of CAD skills designed to give students appropriate entry-level CAD skills.
Prerequisites: ARCH 122 and ARCH 123

ARCH 206 (4 credits)

Advanced Methods and Materials of Construction

Detailed investigation of commercial construction systems with a more in-depth review of construction materials than introduced in the first year. Materials considered in a systems approach, including floor, wall, roof, glazing, and finish systems. Selected criteria of cost, installation, long-term material performance, limitations, and whole-building integration are identified for individual materials.

Prerequisite: ARCH 161

ARCH 211 (2 credits)
Structural Systems

Historical development of structures. Includes the loads and stability of structures. Identifies various stresses, including tension, compression, sheer, and bending. Looks at design requirements, characteristics, limitations, and rules of thumb utilizing wood, steel, and concrete systems; analyzes beams, columns, frames, trusses, and connection components and details in structural design.

ARCH 216 (3 credits)
Site and Microclimate Design

Specifies site parameters and impact on building design from site investigation to finished project. Reviews initial design concerns, site vegetation, terrain, winds, waterways, solar access, and seasonal effects. Building design issues are landscaping, grading and drainage, site utilities, paving and roadways, and site amenities.

ARCH 256 (2 credits)
Environmental Systems

Theory, history, design, and explanation of systems affecting building environmental quality. Includes review of plumbing, water, and sanitary systems; the options available in the selection of heating, ventilating, and air conditioning systems; and an energy overview (thermal control, heat load analysis, utilization of solar alternatives, and understanding of indoor air quality concerns). Electrical equipment requirements and loads, artificial and natural lighting and illumination criteria and fixtures are covered, as well as acoustical control construction practices and vertical transportation impact on building design.

ARCH 261 (2 credits)
Life Safety and Building Codes

Philosophy and approaches to life safety, including fire protection systems and the impact of various types of construction on life safety. Traces evolution of building codes and analyzes the building code compliance of various hypothetical case studies. Covers means of egress and construction system assemblies. Reviews barrier-free design requirements and implication on project design.

ARCH 266 (1 credit)
Architectural History and Theories of Design

Overview of architecture, from prehistoric to the 20th century and beyond, including Ancient, Middle Ages, Renaissance, Eastern, Colonial, and Modern. Stylistic characteristics of historical architecture reviewed and analyzed with specific concentration on American architecture. Includes history of urban design and the current changing face of the building environment, from city and suburb to farm.

ARCH 271 (4 credits)
Individual Design Studio

Utilization of material learned throughout the previous three semesters. Students select commercial/institutional building type and design the entire building, from initial design concept to completion of construction documents. Students are responsible for building programming, square footage requirements, design concept, and integration of site, architectural, structural, mechanical, and electrical considerations. Finished project includes a written building program, construction drawings, outline specification, and presentation graphics.

ARCH 276 (2 credits)
Group Design Studio

Project simulates a real-world approach to professional practice by involving the design of a hypothetical renovation and addition to an existing campus building. Small student teams are responsible for delegating all project tasks and monitoring project deadlines and completion dates. At the end, a group effort includes initial design concept, construction budget estimates, construction drawings, outline specifications, and presentation graphics.

ARCH 320 (3 credits)
Understanding Greece: Art, Architecture History, Mythology

A twelve-day guided tour of architectural sites in Greece. The focus is on understanding the contribution of Greece to Western architecture. Studying architecture exposes students to the social, political, economic, and technological history of Greece. Introductory lectures prepare students before the course, which is offered at the end of the spring term.

ARCH 340 (3 credit)
Understanding Italy's History through Its Art and Architecture

A ten-day guided tour of architectural sites in Italy. The focus is on understanding the contribution of Italy to Renaissance art and architecture. Studying art and architecture exposes students to the social, political, economic, and technological history of Italy. Introductory lectures prepare students before the course, which is offered during the spring break of the spring term.

ARCH 360 (3 credits)
Understanding Spain's History through Its Art and Architecture

A ten-day guided tour of architectural and cultural sites of Spain. The focus is on understanding the contribution of Spain to world of art and architecture. Studying art and architecture exposes students to the social, political, religious, economic, and technological history of Spain. Introductory lectures prepare students before the course, which is offered during the spring break of the spring semester.

Automotive Technology

What is Automotive Technology?

Automotive Technology is designed to give students a basic understanding of automotive construction, theory of operation, and standard industry service and repair procedures. This instruction gives them not only the knowledge to perform vehicle service but to develop the skills necessary to diagnose unit malfunctions. Two of the most important skills that will be developed are problem solving and critical thinking.

A Graduate of this Program Will be Able to:

- Diagnose and repair common malfunctions of the following automotive systems: engine lubrication and cooling; brake, suspension, steering, wheels and tires, electrical (including wiring, batteries, starting, charging, and ignition), fuel, onboard electronics/computers, and engine assemblies; and power train components including manual and automatic transmissions and transaxles.
- Develop the knowledge and skills to operate the latest generation of computerized test and diagnostic equipment, including digital storage lab scopes, onboard scan tools, and a chassis dynamometer, as well as develop skills in the safe operation of a chassis dynamometer.
- Develop sound, basic, and safe automotive shop practice skills, including environmental protection.
- Develop good basic shop habits, including demonstrating a good attendance record, punctuality, a willingness to work, and an ability to work with others as a team.
- Apply basic laws of physics/scientific principles to automotive systems and components when performing in-shop testing exercises and diagnosing problems. This includes exam questions containing diagnostic questions.
- Record diagnostic testing data and reports using necessary mathematics; solve basic problems using elementary algebra.
- Locate and interpret technical data represented in shop repair manuals, diagnostic charts, and wiring diagrams. This data will be in hard print and/or various electronic media sources.
- Demonstrate good automotive shop management practices, including student management, customer relations, shop procedures, and writing repair orders.
- Prepare to take and pass the ASE automotive tests series after successful completion of this program and having at least one additional year of on-the-job experience in the particular area or areas that will be tested.
- Prepare to accept the challenge of continuous training in the automotive field, that is, learning to learn, which will be necessary to adapt to new technologies and to become a problem solver and a critical thinker.
- Obtain the Pennsylvania Auto Safety Inspection Certificate and the Pennsylvania Emissions tester certificate.

Martin Christian, Associate Professor

AAS: Thaddeus Stevens College of Technology
PA Vocational Certificate in Automotive Technology from
Penn State University

PA Certificate of State Inspection Instructor
PA Certificate of Emission Inspection Instructor
PA Certified Emission Repair Technician
ASE Certified Master Technician, A1-A8
ASE Certified Advanced Engine Performance
Specialist L1
ASE Certified Master Engine Machinist
ASE Certified Heavy Truck Technician T2 and T6
ASE Certified Under Car Specialist
GM Certified Technician

Namaan Hedge, Instructor

AAS: Thaddeus Stevens College of Technology



**Model Schedule For
Automotive Technology**

Semester 1

AUTO 106: Automotive Service Fundamentals	2
*AUTO 111: Internal Combustion Engine Service	4
AUTO 116: Chassis Service/Steering & Suspension	3
MATH 126: Technical Math I (or higher)	3
CIS 111: Intro to Computer Applications	3

Semester 2

AUTO 156: Automotive Brake Systems	3
AUTO 161: Automotive Electrical/Electronic Principles	4
*AUTO 166: Engine Electrical/Electronic Principles	4
AUTO 171: Fuel and Emission Systems	4
PHYS 106: Physics for Everyday Life (or higher)	3
ENG 106: English Composition	3

Semester 3

*AUTO 206: Advanced Engine Diagnosis	3
*AUTO 211: Advanced Chassis Service	3
AUTO 216: Independent Diagnosis and Repair	3
AUTO 222: Pennsylvania Safety Inspection/Enhanced Emissions Inspection Certification	2
ENG 221: Public Speaking OR	3
*ENG 216: Technical Writing	
Humanities Elective	3

Semester 4

AUTO 256: Heating and Air Conditioning	2
AUTO 261: Drive Train and Manual Transaxle Service	3
AUTO 266: Advanced Engine Computer Control Analysis	3
AUTO 271: Automatic Transaxle Service	4
*AUTO 276: Fuel Injection Systems	3
General Studies Elective	3
General Studies Elective	3

Additional General Education Requirements

HEAL 106 OR HEAL 111	1
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TOTAL CREDITS	75
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** Prerequisite or Co-requisite Required. See Course Description.*

Automotive Technology (AUTO)

AUTO 106 (2 credits)

Automotive Service Fundamentals

This course presents an overview of the automotive industry, including an introduction to the automobile and its systems. Jobs in the automotive service field are covered as are shop work and service information and how to find it. Electronic information systems Mitchell 1 and ALLDATA are utilized. Safety in the auto shop, including the proper use of basic hand and common power tools, is demonstrated. Environmental protection is taught, including recycling and the proper use and approved disposal methods of common automotive shop chemicals are discussed. Demonstrations and hands-on training in common automotive shop practices, such as tube flaring and thread construction and repair. Fasteners, including torque to yield, are thoroughly covered. Measurement systems, USC and metric, are discussed, including hands-on training using all common automotive precision measurement tools like micrometers, dial indicators, and torque wrenches. The theory and servicing of automotive rolling bearings are covered; wheel bearings are emphasized.

AUTO 111 (4 credits)

Internal Combustion Engine Service

This course covers the basic theory, design, and operating fundamentals of spark ignition piston engines. Extensive mechanical testing and diagnostic procedures are demonstrated, including compression and vacuum testing utilizing wave form analysis with lab scopes. Power balance, including both intrusive and non-intrusive are demonstrated. Running and snap-throttle compression testing are featured. Methods to check valve timing on pushrod and overhead cam engines are demonstrated. Engine lubrication systems and automotive lubricants are studied; diagnostic and test procedures are performed. Engine cooling systems, theory, and standard service procedures are also included. Machining of engine components and restoring of all tolerances are covered. Cylinder head servicing is performed, and the three-angle cut method is used. Complete disassembly, all precession measurements, component servicing, resealing and reassembly on actual engines takes place.

Prerequisite: AUTO 106

AUTO 116 (3 credits)

Chassis Service/Steering and Suspension

The basic theory and operating principles of automotive suspension and steering systems are studied; service, repair and diagnostic procedures are featured. Tire and wheel service and computer balancing are performed by students. The Hunter Road Force wheel balancer and vibration solver, Model 9700 is featured. Even the widest tires mounted on the newest custom wheels will be no problem when learning to use the Hunter Model TS3500 tire changer. The safe and proper method of airbag module handling is taught. Wheel alignment principles are covered, including both the simple basic maintenance wheel alignment and the more complicated diagnostic wheel alignment. Complex alignment factors such as tire scrub radius, included angle and steering axis inclination, is covered in depth. Hands-on tire and wheel servicing, pre-alignment inspections, and wheel alignment measurements are taken on live vehicles.

AUTO 156 (3 credits)

Automotive Brake Systems

Modern automotive brake systems and their operating principles are studied and standard repair and service procedures are performed. Drum, disc/drum, and four-wheel disc systems are featured. Power-assist systems and parking brake systems are included. An introduction to the theory and servicing of antilock brake systems, including first generation Bosch type and the newest non-integral systems, are covered. Trouble code retrieval and onboard diagnostics using scan tools is featured.

AUTO 161 (4 credits)

Automotive Electrical/Electronic Principles

The theory of electricity—including Ohm's Law, Kirchhoff's Law, series and parallel circuits, AC and DC current flow—is studied. Basic test meter procedures are featured, and solid state devices, integrated circuits, and on-board microcomputers are explained. Automotive wiring and common automotive accessory systems are studied, and servicing and repair procedures are performed. Automotive batteries, their construction, theory of operation, and standard service procedures are also included. Hands-on extensive electrical system service is performed using digital volt ohm meters and automotive lab scopes. The PDI DVOM, the Fluke 98 Series II, Vetronix Master Tech, and the cutting-edge Vetronix MTS 5100/5200 lab/ignition scopes are all featured. Low resolution amp clamps from Fluke and Vetronix allows students to experience the latest diagnostics using the latest amp-ramping diagnostic procedures. New material has been incorporated into the electrical and fuel and emissions courses after the instructors attended drive ability training/seminars hosted by such nationally recognized gurus as Jim Linder, Linder Technical Services, Indianapolis; Bill Fulton, Ohio; Jerry Truglia, New York; Dan Marrinucci, Motor Magazine; and Mac Vanden Brink, Michigan.

AUTO 166 (4 credits)

Engine Electrical/Electronic Principles

Cranking circuits and starter motors, charging systems, alternators and voltage regulators, and ignition systems (DIS & EI, including C.O.P./coil on plug) are studied. Simulators are featured to help students better understand system operation. Construction, theory of operation, standard service procedures, and system malfunction diagnosis are covered using the latest test equipment; the new Vetronix MTS 5100/5200 lab scope/engine analyzers, and the Fluke 98 series II is featured. Hands-on comprehensive testing procedures are performed on live vehicles. One of the major goals of this course is for students to gain skills in problem solving through the use of on-car testing and diagnostic procedures. This course culminates with each student performing comprehensive tests on the engine mechanical condition, battery, cranking system, charging system, and the complete ignition system. This is followed by a report analyzing good/bad results.

Prerequisite: AUTO 111

AUTO 171 (4 credits)**Fuel and Emission Systems**

The principles of fuel systems are studied. Fuel delivery systems and fuel pump testing are covered. The history of emissions control systems, from their inception up to the present, is included. Control system theory and operating principles are studied. Service and testing procedures are demonstrated, and on-car tests are performed on all the major emissions systems. The latest evaporative leak tester smoke machines that use nitrogen is used for training. Standard and feedback carburetor operating principles are still briefly covered. Introduction to alternative fuels, electric, and hybrid vehicles are presented. Highlights of the latest Pennsylvania Emissions Testing procedures is featured, and the groundwork of 5-gas diagnostic testing is laid.

AUTO 206 (3 credits)**Advanced Engine Diagnosis**

Covers the use of the Vetronix MTS 5100/5200 Engine Analyzer, Vacutec Leak Detector, and the Mustang Chassis Dynamometer. Theory-related instruction is given on 5-gas analysis and interpreting the results of the analyzer tests with special emphasis on how they relate to advanced diagnosis of ignition, carburetion, fuel injection, charging, cranking, and engine and emission control systems. Demonstrations on hookup and operation are followed by student practice on shop vehicles, and when possible, by repair of client vehicles.

Prerequisite: AUTO 166

AUTO 211 (3 credits)**Advanced Chassis Service**

The Hunter P611 four-wheel aligner featuring the DSP400 Series Sensors (cameras) and the DSP300 Series Sensors are used in this course. Theory-related instruction is given on alignment with special emphasis on 4-wheel alignment. Disc and drum brake machining along with applying non-directional finishes on the AMMCO brake lathe are covered. On-the-car rotor truing is covered featuring the Pro-Cut PFM-900 Smart Lathe. Demonstrations on hook-up and operation are followed by student practice on shop vehicles, and when possible, by repair of client vehicles.

Prerequisites: AUTO 116 and AUTO 156

AUTO 216 (3 credits)**Independent Diagnosis and Repair**

Opportunity to diagnose and make repairs on client vehicles in a simulated dealership atmosphere. Experience acting as shop forepersons, using and writing repair orders, ordering parts, and keeping track of hours on the job and using materials. All repairs relate to the courses taken.

AUTO 222 (2 credits)**Pennsylvania Safety Inspection/Enhanced Emissions Inspection Certification**

Pennsylvania Department of Transportation Vehicle Equipment and Inspection Regulation /Enhanced Emissions Inspector manuals are covered, as per state requirements. A demonstration of the proper procedure for performing a safety inspection on a vehicle is given. Students practice on shop vehicles. Each student is given the opportunity to take the Pennsylvania Safety Inspection written and performance tests along with the Enhanced Emissions written test and computer-based training/tactile test. The Commonwealth, upon satisfactory completion of these tests, will grant a license for each.

AUTO 256 (2 credits)**Heating and Air Conditioning**

Covers the theory of refrigeration and the operating principles of manual and automatic temperature control systems, with special emphasis on diagnosis, service, and repair. Refrigerant recovery, recycling, identification, and recharging techniques on R-12 and R-134a systems are covered in accordance with federal law. The Sun Air-Kare charging station, Everco EREC Recovery/Recycle station, and the Robinair Enviro Charge Combination are featured. Demonstrations given on hook-up, operation, and servicing, followed by student practice on shop vehicles, training aids (clutch and seal replacement) and repair of client vehicles.

AUTO 261 (3 credits)**Drive Train and Manual Transaxle Service**

Basic operating principles of manual transaxles, differentials, clutches, and universal joints. C-V joints, drive axles, and drive shafts, along with diagnosis and basic service techniques. Demonstrations given on differential set-up, replacing universal and C-V joints, also clutch replacement and adjustment. Students practice disassembly, precision measurements, adjustments and assembly techniques on training aids and work on client vehicles when possible.

AUTO 266 (3 credits)**Advanced Engine Computer Control Analysis**

Sensor-related theory, testing procedures, and waveform analysis are studied. OBD-II theory and the related testing procedures are covered. How to use shop manuals to follow manufacturers' procedures for troubleshooting engine drivability problems on computer-controlled cars, along with lab scopes (Fluke 98 Series II), break out boxes, and the Master Tech 3100 hand-held scanner are used to recover trouble codes from the computer's memory and reading sensor stream data. Emphasis is placed on the diagnosis and the interpretation of the results. Students practice on shop vehicles and repair client vehicles when possible.

AUTO 271 (4 credits)**Automatic Transaxle Service**

Basic principles of automatic transmissions, including lock-up torque converters, diagnosis, and basic service techniques. Chrysler 40TE electronic transaxle theory is covered. Demonstrations given on pressure checks and shift points, using gauges and a chassis dynamometer. Students practice disassembly, precision measurements, testing, adjustments, and assembly techniques on training aids. Where possible, repair on client vehicles is included.

AUTO 276 (3 credits)**Fuel Injection Systems**

The basic operating principles of the Bosch mechanical fuel injection system along with Chrysler and G.M. throttle body and port systems are covered in this course. Special emphasis is placed on diagnosis and service techniques. The EMI-TECH fuel system analyzer is featured. Cleaning a fuel injection system on the vehicle is covered featuring the Bilstein EFI-800 fuel system service center. Students practice on shop vehicles and work on client vehicles when possible.

Prerequisite: AUTO 171

Business Administration

What is Business Administration?

All employers need highly skilled business personnel to keep their operations running smoothly and successfully. Dynamic careers in business are available in virtually every sector of the economy. Job openings are plentiful, working conditions are comfortable, and opportunities for advancement are within reach for those with a two-year degree.

The Business Administration program at Thaddeus Stevens College provides students with the marketable skills, academic background, and experience required to meet the needs of the workforce or transfer to a four-year university. The broad-based curriculum is designed to prepare recent high school graduates or those re-entering the workforce to reach their full potential in many varied business fields. Faculty are focused on training students to manage rapidly changing technology, to lead and motivate others, to prepare and analyze financial information, and to succeed in the global marketplace. Entry-level job titles for recent graduates include sales and service account manager, accounts payable and receivable clerk, administrative assistant, public relations coordinator, operations coordinator, small business owner, human resources assistant/specialist, and facility supervisor.

A Graduate of this Program Will be Able to:

- Demonstrate excellent communication skills, including the ability to speak and write clearly and effectively, especially for the business setting.
- Demonstrate an understanding of emerging online technologies and trends and their influence on the electronic commerce marketplace.
- Use critical thinking and mathematical skills to analyze and solve accounting and business math problems.
- Demonstrate advanced keyboarding skills as well as spreadsheet, database management, word processing, and presentation applications.
- Assess and influence behavior among peers, subordinates, and managers; work well as an individual, in groups, and on teams.
- Demonstrate an understanding of the marketer's tasks and knowledge in the principles of how those tasks can be accomplished.
- Investigate the basic practices and principles involved in the administration of a modern business, and evaluate various career paths that may be pursued.
- Predict managerial success by studying the primary theories, principles, and processes of management.
- Demonstrate an understanding of the judicial process and business law in areas such as leases, contracts, and employment law, and how they impact various forms of business organizations.
- Display a general knowledge of the social sciences and understand their effect on the workforce and society.

Elizabeth A. Wagman, Professor
 MEd: The Pennsylvania State University
 BS: Shippensburg University of Pennsylvania

Danielle Fox, Instructor
 MBA: LaSalle University
 BBA: Temple University



Model Schedule For Business Administration

Semester 1

BUAD 117: Introduction to Business	3
BUAD 121: Business Skills Lab	1
BUAD 160: Principles of Management	3
BUAD 166: Business Computer Applications I	3
MATH 137: Intermediate Algebra (or higher)	3
ENG 106: English Composition	3

Semester 2

BUAD 157: Principles of Marketing	3
BUAD 171: Business Skills Lab	1
BUAD 257: Electronic Commerce	3
*BUAD 266: Business Computer Applications II	3
Science Elective	3
ENG 221: Public Speaking	3

Semester 3

BUAD 106: Accounting Principles I	3
BUAD 213: Introduction to Law and Business Law	3
BUAD 221: Organizational Behavior	3
BUAD 226: Business Skills Lab	1
BUSN 106: Small Business Management	3
ECON 230: Microeconomics	3

Semester 4

*BUAD 156: Accounting Principles II	3
BUAD 267: Human Resources Management	3
BUAD 271: Business Skills Lab	1
BUAD 276: Business Communications	3
ECON 240: Macroeconomics	3
Humanities Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
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TOTAL CREDITS **65**

** Prerequisite or Co-requisite Required. See Course Description.*

Students may not take CIS 111 or 211 since this material is covered in BUAD 166 and 266

A proposed substantive change to the Business Administration program is pending approval by the Middle States Commission on Higher Education.

Business Administration (BUAD)

BUAD 106 (3 credits) **Accounting Principles I**

Introduction to the principles of accounting, the accounting cycle, the interpretation and recording of financial data, and the summarizing and reporting process. Emphasis is on the sole proprietor of a business. This course provides a foundation for further study in the accounting field.

BUAD 117 (3 credits) **Introduction to Business**

This course is designed to introduce students to the primary fields of business and to inform them of the various career paths that they may pursue. The basic principles, forms, and practices involved in the administration of a modern business are examined.

BUAD 121 (1 credit) **Business Skills Lab**

Keyboarding skills are needed in many positions in today's job market. Advanced keyboarding and communication skills are essential in the business field. This course is designed to improve keyboarding proficiency and language arts skills in the production of business correspondence.

BUAD 156 (3 credits) **Accounting Principles II**

This course is a continuation of Accounting Principles I. Analysis and discussion of more complex financial concepts and statements are conducted.

Prerequisite: BUAD 106

BUAD 157 (3 credits) **Principles of Marketing**

An interactive approach to guide students in becoming better business people. The skills and responsibilities of planning, producing, pricing, promoting, and distributing are presented as an art and a science through realistic marketing situations and case studies.

BUAD 160 (3 credits) **Principles of Management**

This course is designed to prepare BUAD students for management success by studying the primary theories, principles and processes of management. Students will gain valuable insight in issues such as leadership, planning and control, problem solving and creativity, organizational culture and change, ethics and social responsibility, and working in and managing groups.

BUAD 166 (3 credits) **Business Computer Applications I**

Microsoft Office programs (Excel®, Access®, PowerPoint®, and Outlook®) are studied in order for students to develop intermediate skills in spreadsheet, database, e-mail, and presentation applications.

BUAD 171 (1 credit) **Business Skills Lab**

Designed to provide students with independent keyboarding practice and desktop publishing experience. An introduction to Microsoft Publisher® covers the basics, such as how to create typical business publications. Advanced keyboarding skills are developed through daily practice using the Mavis Beacon typing tutorial.

BUAD 213 (3 credits) **Introduction to Law and Business Law**

Designed to give students an introduction to the sources of law, judicial process, and an overview of laws including criminal law, tort law, property law (including personal property, real estate, and landlord-tenant law), and wills, estates, and trusts. Also provides a basic understanding of contracts, sales and leases of goods, secured transactions, agency and employment law, and forms of business organizations

BUAD 221 (3 credits) **Organizational Behavior**

This course is a study of workplace behaviors, structures, and processes. Self-analysis and reflection are practiced in small groups through case studies, surveys, and discussion. Motivational theories and leadership styles are surveyed; decision making and business designs and cultures are investigated.

BUAD 226 (1 credit) **Business Skills Lab**

Accounting lab for working individually and in groups to complete accounting problems and worksheets. Additional assignments in related business coursework due weekly.

BUAD 257 (3 credits) **Electronic Commerce**

Overview of emerging online technologies and trends and their influences on the electronic commerce marketplace. Explores nature and impact of e-commerce on business operations, resources, and management. Upon completion of the course, students will have a firm grasp of global e-commerce business trends and the technologies required to implement them.

BUAD 266 (3 credits)**Business Computer Applications II**

Students develop advanced computer skills in Microsoft Office® applications. Exercises based on real-life business situations give students hands-on experience in Excel®, PowerPoint®, Access®, and Outlook® programs. Lessons are structured to prepare students for Microsoft certification testing at the expert level.

Prerequisite: BUAD 166

BUAD 267 (3 credits)**Human Resources Management**

This course prepares students to work in administrative and management positions and serves as a basis of further study in the field of human resources management. In accordance with suggested Society for Human Resource Management (SHRM) guidelines, both personal competencies and business policies are addressed in this course.

BUAD 271 (1 credit)**Business Skills Lab**

QuickBooks® software training. Self-paced and guided learning to learn to use this popular accounting program.

BUAD 276 (3 credits)**Business Communications**

A practice in writing, revising, and editing business communications, including memos, business letters, e-mail messages, reports, web-based information, and job search documents. The ability to convey information in a clear, concise manner is developed along with critical thinking and communication skills.



Cabinetmaking & Wood Technology

What is Cabinetmaking and Wood Technology?

Repeated surveys of the woodworking industry have revealed the number one concern facing the industry for the 21st century is the lack of skilled and motivated workers. There is a continual need in the furniture, kitchen cabinet, and architectural millwork industries for persons possessing the skills and knowledge required to produce high quality wood products.

The Cabinetmaking and Wood Technology program is committed to continually providing students with the skills and knowledge required for rewarding jobs in the various woodworking industries. Based upon the belief that students learn best by working on projects, this program is strongly project-oriented.

Hence, students will produce several pieces of fine furniture after which they will further develop and display their skills by producing an advanced wood project of their choosing. Through the use of the College's housing project, students will also learn to list and produce all the millwork items required for a residential house. Additionally, students will design, produce, finish, and install a complete kitchen. Through the use of lectures, demonstrations, and the above projects, the program faculty feel they can best prepare students for careers in any of the three major woodworking fields: fine furniture, architectural millwork, and kitchen cabinetry.

A Graduate of this Program Will be Able to:

- Identify nomenclature and the proper use of hand and portable power tools.
- Apply the knowledge of wood as a material in the proper construction of various fine furniture projects.
- Demonstrate safe practice in the use and setup of trade machinery.
- Demonstrate skill in the use of drafting equipment in order to produce shop drawings.
- Read shop blueprints to develop accurate material lists.
- Demonstrate knowledge of finishing materials along with the skills required for wood finishing including the following: wood preparation, wood coloring using various stains, and top coating using oil finishes, shellacs, varnishes, and lacquers.
- Demonstrate the ability to list and prepare millwork items required for various building projects.
- Demonstrate proficiency in grinding knives for the shaper and moulder and the setup of machines for production.
- Demonstrate the ability to produce jigs and fixtures required for production work.
- Demonstrate the skills and knowledge necessary for kitchen layout, design, construction, and installation.
- Develop the skills and knowledge required for producing various types of countertops.
- Develop a strong work ethic along with the ability to work independently and as a contributing member of a team.

Stephen P. Latta, Professor

MA: The Pennsylvania State University

BS: Ohio University

Member of Executive Committee for The Society of

American Period Furniture Makers

Certification from DeVilbiss Corporation in

Spray Finishing Technologies

Member of the Furniture Society

Contributing Editor to Fine Woodworking Magazine

Juried Member: Pennsylvania Guild of Craftsmen

Robert S. Tobias, Associate Professor

BS: The Pennsylvania State University

Architectural Woodwork Institute (AWI) Central PA Chapter

Board of Directors

National Kitchen and Bath Association

Cabinetmaking Technical Expert SkillsUSA World Team -

Calgary, Canada, 2009

Rio de Janeiro, Brazil, 2010

London, United Kingdom, 2011

San-Paulo, Brazil, 2012

Leipzig, Germany, 2013

Bogata, Columbia, 2014

Cabinetmaking Deputy Chief Expert SkillsUSA World Team -

San Paulo, Brazil, 2015

Abu Dhabi, United Arab Emirates, 2017

Model Schedule For

Cabinetmaking & Wood Technology

Semester 1

CABM 106: Hand Tools and Portable Power Tools 4

CABM 111: Furniture Construction I 4

CABM 116: Finishing I 1

CABM 121: Related Drawing I 2

†MATH 126: Technical Math I (or higher) 3

CIS 111: Intro to Computer Applications 3

Semester 2

***CABM 151: Advanced Machinery** 3

***CABM 156: Furniture Construction II** 4

***CABM 161: Finishing II** 1

***CABM 166: Job Management** 1

***CABM 171: Related Drawing II** 2

CIS 105: Drawing with AutoCad 3

***MATH 132: Elementary Geometry (or higher)** 3

Semester 3

***CABM 206: Advanced Wood Project** 6

***CABM 211: Machine Maintenance** 1

***CABM 221: Architectural Millwork** 4

***CABM 226: Custom Woodworking Cutters** 1

ENG 106: English Composition 3

Science Elective 3

Semester 4

***CABM 251: Shop Operations and Management** 1

***CABM 261: Kitchen Cabinet Planning and Estimating** 3

***CABM 263: Kitchen Cabinet Construction** 4

***CABM 265: Cabinet Installation** 2

***CABM 267: Counter Top Fabrication** 2

Humanities Elective 3

Additional General Education Requirements

HEAL 106 or HEAL 111 1

General Studies Elective 3

TOTAL CREDITS 71

** Prerequisite or Co-requisite Required. See Course Description.*

† Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 126 and MATH 132, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.



Cabinetmaking and Wood Technology (CABM)

CABM 106 (4 credits)

Hand Tools and Portable Power Tools

Students study the wide variety of hand tools, building a thorough foundation in hand tool usage, maintenance, and sharpening. They will learn the basics of hand joinery and develop an understanding for the capabilities and proper usage of portable power tools. This knowledge will be applied to various projects.

CABM 111 (4 credits)

Furniture Construction I

This course provides a foundation for the construction of various types of cabinetry and furniture. The course includes an overview of wood characteristics and joinery methods, assembly, abrasives, adhesives, and veneering basics. Machinery maintenance, safety, and usage is stressed as well. Construction projects will aid in developing an understanding of the subject matter.

CABM 116 (1 credit)

Finishing I

This class focuses on surface preparation and the proper use of finish materials. Various methods of application, including wiping, brushing, and spraying, is addressed. During this introductory course, students apply a wax, shellac, and lacquer finish on the projects completed in class.

CABM 121 (2 credits)

Related Drawing I

An introduction to basic blueprint reading and drafting techniques applicable to the cabinetmaking profession.

CABM 151 (3 credits)

Advanced Machinery

This course teaches the proper set-up and use of the hollow-chisel and slot mortiser, shaper, single-end tenoner, wide-belt sander, and panel saw. The course also provides an in-depth look at the various types of cutters and cutter-heads available for the shaper. Additional machines are added to fit project requirements and available time.

Prerequisite: CABM 106, CABM 111, and CABM 116

CABM 156 (4 credits)

Furniture Construction II

Students take a more in-depth look at wood properties, joinery, and construction methods. An emphasis is placed on precision machining techniques and strategies for producing molding and other furniture and case components. Other topics include door and drawer construction and styles, hardware and its applications, and an introduction to furniture styles and types. The construction of various furniture projects help solidify the subject matter.

Prerequisite: CABM 106, CABM 111, and CABM 116

CABM 161 (1 credit)

Finishing II

The finishing course involves the final preparation of wood surfaces and the selection and application of appropriate finishing materials. Topics include dyes and pigmented stains, a variety of sealers and top-coating materials, as well as spray finishing techniques.

Prerequisite: CABM 116

CABM 166 (1 credit)

Job Management

This course provides an overview of estimating, cost analysis, and methods of job documentation. Students maintain daily time cards as well as job folders for their various furniture projects. Job folders contain drawings; route and cut sheets; time and cost analysis sheets; bill of materials; materials invoice; and a finishing schedule.

Prerequisite: CABM 111

CABM 171 (2 credits)

Related Drawing II

A further study into basic blueprint reading and drafting techniques applicable to the cabinetmaking profession as introduced in CABM 121.

Prerequisite: CABM 121

CABM 206 (6 credits)

Advanced Wood Project

From an existing plan of their choice, students construct and finish advanced pieces of furniture. This course emphasizes individual planning and problem solving. Students construct their own jigs and fixtures as well as machine set-ups. All projects require an existing set of plans and the approval of the instructor before starting. Students are responsible for supplying the necessary materials, hardware, and finishing supplies required for the project.

Prerequisites: CABM 111, CABM 151, CABM 156, and CABM 161

CABM 211 (1 credit)

Machine Maintenance

To develop the skills necessary to grind jointer and planer knives, sharpen shaper cutters, and clean and lubricate a variety of common woodworking machines.

Prerequisite: CABM 151

CABM 221 (4 credits)
Architectural Millwork

This course exposes students to the field of custom architectural millwork. Emphasis is placed on students developing an understanding of the Architectural Woodworking Quality Standards as developed by the Architectural Woodwork Institute. A large portion of the course is devoted to live work in which students produce the millwork items required for the housing project and other related campus work.

Prerequisites: CABM 111, CABM 151, and CABM 156

CABM 226 (1 credit)
Custom Woodworking Cutters

Students learn how to design, draw, make a template, and grind two matching cutters for the shaper and the moulder.

Prerequisite: CABM 151

CABM 251 (1 credit)
Shop Operations and Management

This course stresses the fundamentals of ordering, purchasing, estimating, scheduling production, and general management techniques.

Prerequisite: CABM 151

CABM 261 (3 credits)
Kitchen Cabinet Planning and Estimating

Students learn how to plan, draw, estimate the cost, and list the materials and supplies for the kitchen cabinets and vanities that are used in the housing project.

Prerequisites: CABM 121 and CABM 171

CABM 263 (4 credits)
Kitchen Cabinet Construction

As follow-up to CABM 261, this course emphasizes the machining, construction, and finishing of the kitchen cabinets, vanities, and trim used in the housing project.

Prerequisites: CABM 111, CABM 151, CABM 156, and CABM 206

CABM 265 (2 credits)
Cabinet Installation

This course involves site preparation and the installation of kitchen cabinets and bathroom vanities. Emphasis is placed on the installation manuals of the National Kitchen and Bath Association (NKBA).

Prerequisites: CABM 106 and CABM 263

CABM 267 (2 credits)
Countertop Fabrication

This course involves the fabrication of high pressure plastic laminate and solid surface countertops. Exposure to other types of countertop materials is included.

Prerequisite: CABM 106



Carpentry Technology

What is Carpentry Technology?

The Carpentry Technology program provides carpentry students with a positive and professional experience. By using the most up-to-date equipment and the newest technology, program faculty always strive to run parallel with the present-day building industry. Students receive 2 years of excellent training that sufficiently prepares them for the residential and light commercial construction workforce.

A Graduate of this Program Will be Able to:

- Write clear, concise, legible, and accurate technical reports and be skilled in oral communication related to the construction industry.
- Demonstrate the basic manipulative skills of the trade that are necessary in laying out work, planning, erecting, and framing.
- Interpret and prepare plans, drawings, codes and specifications, lines, symbols, and abbreviations on working drawings or blueprints.
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- Analyze specifications and contract drawings as well as make accurate quantity take-offs and labor estimations to develop an estimated construction cost for a building project.
- Demonstrate the ability to lay out and erect a platform or western frame structure.
- Demonstrate basic knowledge and skill in masonry and in the concrete construction trade.
- Describe various types of materials and methods available to the construction trade.
- Describe business organization, financing, labor relations, selling, pricing, customer service, management, and other business principles.
- Describe the complexity of the building construction industry, the interrelationships of the various trades, and methods of communication and coordination among all trades and professions within the industry.
- Encourage the practice of staying current with any new technology or codes related to the building industry.

Timothy B. Draper, Instructor

AAS: Thaddeus Stevens College of Technology
Occupational Safety and Health Administration
(OSHA): Construction Safety & Health Certificate

Daniel McCord, Instructor

BS: Millersville University of Pennsylvania

Daniel B. Noel, Assistant Professor

BS: Lancaster Bible College
AST: Williamson Free School of Mechanical Trades
NCCER Certified Instructor Carpentry Level 4
Occupational Safety and Health Administration
(OSHA): Construction Safety & Health Certificate

Andrew Snively, Instructor

BS: The Pennsylvania State University



Model Schedule For Carpentry Technology

Semester 1

CARP 106: Hand Tools and Power Tools	3
CARP 111: Building Materials	3
CARP 116: Site Work and Foundations I	3
CARP 182: Construction Drawings and Blueprint Reading	3
†MATH 126: Technical Math I (or higher)	3
ENG 106: English Composition	3

Semester 2

CARP 157: Floor, Wall, and Ceiling Framing	3
CARP 161: Stair Construction	2
CARP 166: Roof Framing and Materials	3
CARP 177: Exterior and Interior Finish	3
CIS 111: Intro to Computer Application	3
*MATH 132: Elementary Geometry (or higher)	3

Semester 3

CARP 207: Floor Construction	2
CARP 209: Wall Construction	3
CARP 218: Roof Construction	3
CARP 219: Thermal Insulation	1
CARP 222: Exterior Finish and Trim	2
*ENG 216: Technical Writing OR ENG 221: Public Speaking	3
BUSN 106: Small Business Management	3

Semester 4

CARP 226: Drywall Installation and Finish	1
CARP 257: Stair Trim	2
CARP 267: Interior Finish and Trim	3
CARP 272: Site Work and Foundations II	2
CARP 276: Residential Remodeling	3
Humanities Elective	3
Science Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
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TOTAL CREDITS 70

* Prerequisite or Co-requisite Required. See Course Description.

† Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 126 and MATH 132, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

Carpentry Technology (CARP)

CARP 106 (3 credits)

Hand Tools and Power Tools

This course is a general introduction to the basic tools that are used by a carpenter with an emphasis on safety, proper usage and procedures, and various applications that are most commonly used in the carpentry trades.

CARP 111 (3 credits)

Building Materials

Covering the wide range of building materials used in carpentry, this course examines the many different types of wood products, including engineered lumber and the newest technology of steel framing. Proper procedures for estimating these building materials and the variety of fastening materials are also discussed and practiced.

CARP 116 (3 credits)

Site Work and Foundations I

In this course, students learn how to set up and operate the transit level and laser level. Building layout and excavation of residential construction will be explained, with particular emphasis on building stake-off. Types of footers, foundations, and concrete forming are also explored. Students will be challenged to practice proper building site layout, constructing concrete stair and sidewalk forms, and installing the form-a-drain system.

CARP 157 (3 credits)

Floor, Wall, and Ceiling Framing

With a strong emphasis on platform framing, students will examine and demonstrate the proper methods of constructing subfloors, walls, and ceilings in the framework of residential and light commercial construction. This includes discussing the basic components and construction methods of light-gauge steel framing.

CARP 161 (2 credits)

Stair Construction

Students learn the different types of stairways and all parts pertaining to them. They also learn how to calculate, lay out, and construct stairway stringers with their proper landings, risers, treads, and railings.

CARP 166 (3 credits)

Roof Framing and Materials

The different types of roof systems and all the material members that are involved in the different roof types are discussed. Students learn theoretically how to calculate rafters to fit their proper situations and practice laying out and cutting common and hip rafters.

CARP 177 (3 credits)

Exterior and Interior Finishes

In this course, students will study and practice installing various types of exterior and interior finish material for residential construction. For exterior finish, we will give special attention to the proper installation procedures for roofing; siding; soffit; windows and doors; and aluminum trim. For interior finish, strong emphasis is placed on proper techniques for hanging drywall; installing prehung doors and door trim; applying trim around a window unit; and other common trim materials.

CARP 182 (3 credits)

Construction Drawing and Blueprint Reading

In this course students will learn the proper techniques necessary to dissect a set of residential blueprints and develop a broad understanding of the language of construction drawings. We will also become involved in duplicating, through the process of mechanical architectural drafting, a few select detailed residential section drawings, with each having different drafting scales.

CARP 207 (2 credits)

Floor Construction

Covers both dimensional and engineered lumber applications. To meet current building designs and codes, students perform installation from a detailed blueprint for sill plates, joists, joist hangers, stair beams, sub flooring, and stair stringer construction.

CARP 209 (3 credits)

Wall Construction

Covers both dimensional and engineered lumber applications. To meet current building designs and codes, students perform installation and layout from a detailed blueprint for wall plates, stud size and spacing, header design and size, and rough opening sizes for window and door schedules.

CARP 218 (3 credits)

Roof Construction

Covers engineered trusses and hand-framed rafters with ceiling joists. The students become familiar with the installation and design criteria of an engineered truss including detailed truss drawings for field applications and the codes applying to field modifications. Students perform layout, cutting, and installing roof rafters from a detailed blueprint including proper ceiling joists, collar ties, and gable overhang construction and codes. Students install roof sheeting and fascia boards.

CARP 219 (1 credit)**Thermal Insulation**

Covers the various types of insulation for thermal, noise, and fire protection. Ventilation baffles, vapor barriers, and types of loose fill insulation are detailed. Students perform installation of insulation for wall, ceiling, and fire-stop applications.

CARP 222 (2 credits)**Exterior Finish and Trim**

Covers the exterior materials used for siding, roofing, flashing, and aluminum trim. Using accepted methods, students perform siding, soffit, fascia, and fiberglass shingle applications, including proper flashing and counter flashing techniques.

CARP 226 (1 credit)**Drywall Installation and Finish**

Covers the types and sizes of drywall installed in construction, as well as proper hanging and finishing. Site techniques are covered. Students perform installation and finishing methods for standard applications.

CARP 257 (2 credits)**Stair Trim**

Covers the variety and designs of interior custom stair trim. Students are instructed in the different stair designs, building codes and the perspective trim applications. Students install custom stair trim for an open stair and box stair designs including over the tread skirt board applications.

CARP 267 (3 credits)**Interior Finish and Trim**

Covers the various interior painting and staining finishes. The proper wood types and species, finishing methods, and applications are detailed. Details of interior pre-hung doors, window trim including extension jambs and sills are covered. Students perform the installation of a standard trim package.

CARP 272 (2 credits)**Site Work and Foundations II**

Covers the details associated with site preparation and foundation inspections for a new building. Specifics are for lot size, set back, right of way, and building location. Work includes using various instruments for batter board installations, excavation of foundation, locating footer elevation, and forming and pouring footers. Locating, forming, and pouring of sidewalks and exterior porches.

CARP 276 (3 credits)**Residential Remodeling**

Covers the details and techniques used for residential remodeling and restoration. Students perform demolition, and repair and update existing structures to current building codes. The topics covered can include kitchens, bathrooms, flooring and exterior finishes.



Collision Repair Technology

What is Collision Repair Technology?

Students will be instructed in a series of I-CAR courses in Non-Structural ProLevel 1 and Refinishing ProLevel 1, the industry standard for collision repair training. Students graduate with a variety of nationally-recognized platinum certificates from I-CAR. This program aligns with collision repair businesses needing to hire employees to maintain or to become I-CAR Gold Class professionals. This program makes students proficient at entry-level tasks. Students also have the opportunity to become certified as ASE Master Technicians. The Collision Repair Technology program is dedicated to providing the most current and complete information, knowledge, and skills required to perform complete, safe and quality repairs. Thaddeus Stevens College of Technology provides students with comprehensive training and industry recognized credentials for a successful career in collision repair.

A Graduate of this Program Will be Able to:

- Use collision repair tools and equipment safely and effectively.
- Analyze the structural design of a vehicle and its reaction to an impact.
- Repair damaged metal.
- Refinish vehicles.
- Install panels.
- Repair frame damage.

Steve Johnston, Instructor
 BS: Millersville University
 Vocational Certification: Temple University

Jason Weiler, Instructor
 BA: Ashford University
 AAS: Thaddeus Stevens College of Technology

Model Schedule For Collision Repair Technology

Semester 1

CORT 107: Details of Body Construction	4
*CORT 111: Collision Repair Welding	4
*CORT 116: Repairing Damaged Panels and Metalworking	4
MATH 126: Technical Math I (or higher)	3
ENG 106: English Composition	3

Semester 2

*CORT 156: Introduction to Refinishing Procedures	4
*CORT 162: Panel Replacement, Adjustment, Corrosion Protection	4
*CORT 166: Introduction to Frame Alignment and Repair	4
*ENG 216: Technical Writing	3
CIS 111: Intro to Computer Applications	3

Semester 3

*CORT 212: Estimating Technology	4
*CORT 222: Aluminum Technology	4
*CORT 232: Non-Structural Technology	4
MATH 111: Business Math	3
BUSN 106: Small Business Management	3

Semester 4

*CORT 252: Steel Structural Technology	4
*CORT 262: Refinishing Technology	4
*CORT 272: Mechanical Technology	4
Humanities Elective	3
Science Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
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TOTAL CREDITS 73

** Prerequisite or Co-requisite Required. See Course Description.*



Collision Repair Technology (CORT)

CORT 107 (4 credit)

Details of Body Construction

Different types of automobile bodies and how they are made at the factory. The locations of body joints and parts and the proper methods for parts removal and replacement are also covered.

CORT 111 (4 credits)

Collision Repair Welding

Designed to prepare students in the use of a MIG welder and the various uses of oxyacetylene equipment for cutting and heating to normalize and shrink metal. Proper use of equipment is stressed.

Prerequisite: CORT 107

CORT 116 (4 credits)

Repairing Damaged Panels and Metalworking Methods

Use of proper tools and techniques to bend sheet metal. Direct and indirect damage are explained along with ways damage can be corrected.

Prerequisite: CORT 111

CORT 156 (4 credits)

Introduction to Refinishing Procedures

Refinishing and the use of tools operated by compressed air. Proper use of various finish materials such as primers, sealers, and thinners. Masking and spray painting techniques are also covered.

Prerequisite: CORT 116

CORT 162 (4 credit)

Panel Replacement, Adjustment, and Corrosion Protection

Proper removal and replacement of panels are stressed as well as the proper alignment of panels. A general overview of determining repair procedures, inspecting areas for hidden damage, removal of damaged panels, and corrosion protection.

Prerequisite: CORT 156

CORT 166 (4 credits)

Introduction to Frame Alignment and Repair

Frame alignment and straightening is studied, including the use of gauges and frame straightening equipment needed to restore a damaged frame or body to factory specifications.

Prerequisite: CORT 162

CORT 212 (4 Credits)

Estimating Technology

Estimators inspect and analyze collision-damaged vehicles to create a repair plan. The technician builds relationships with vehicle owners, repairers, and insurance personnel, ensuring satisfaction when repairs are complete.

Prerequisite: CORT 166

CORT 222 (4 Credits)

Aluminum Technology

An aluminum structural technician restores aluminum structural dimensions and structural integrity to collision damaged vehicles. He or she uses measuring and frame equipment to diagnose, damage, and return damaged frame or uni-body parts to manufacturer's specifications.

Prerequisite: CORT 212

CORT 232 (4 Credits)

Non-Structural Technology

Non-structural technicians restore damaged vehicles to their original structural integrity, function, and appearance. These technicians use hand tools and power tools to remove or repair damaged parts, weld as needed, and properly install new parts. They work with a variety of metals and plastics, as well as glass, electrical, and mechanical parts.

Prerequisite: CORT 222

CORT 252 (4 Credits)

Steel Structural Technology

Steel structural technicians restore structural dimensions and integrity to collision damaged vehicles. Technicians use measuring and framing equipment to diagnose damage and return damaged frame or uni-body parts to manufacturer's specifications. Hand tools and power tools are used to remove or repair damaged parts, weld as needed, and properly install new parts. This individual also works with a variety of metals and plastics, as well as glass, electrical, and mechanical parts.

Prerequisite: CORT 232

CORT 262 (4 Credits)

Refinishing Technology

Refinish technicians prepare and apply paint to repaired vehicles. Duties may include final sanding, masking, color mixing and tinting, operating spray booths, and applying primers, sealers, color, and clear coats. They may need to blend color into adjacent panels for a better color match to existing vehicle paint. These individuals work with potentially hazardous materials, so attention to safety and personal protection are essential. Vehicles must be correctly prepared and refinished to ensure proper adhesion, color match, and overall appearance.

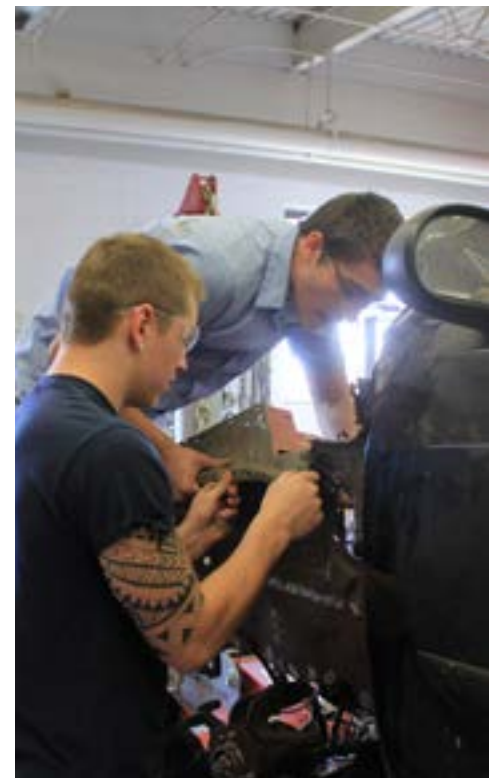
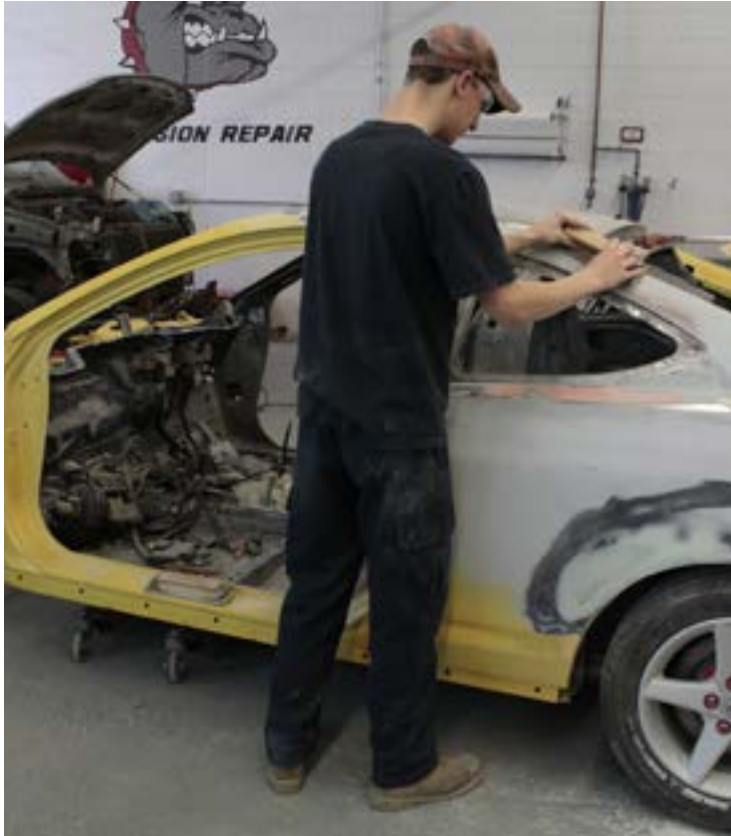
Prerequisite: CORT 252

CORT 272 (4 Credits)

Mechanical Technology

The mechanical technician diagnoses and repairs collision-related mechanical damage which includes steering and suspension systems. Hand tools and power tools are used to remove or repair damaged parts and properly install new and used parts.

Prerequisite: CORT 262



Computer & Network Systems Administration

What is Computer and Network Systems Administration?

The Computer and Network Systems Administration program prepares students for employment in a wide variety of positions in the information technology field. Students work in a live network environment, managing their own servers, clients, routers, and switches by applying concepts learned in the theory classroom. The combination of theory and hands-on lab exercises allows CNSA students to acquire comprehensive skills in the following technical areas: The internal operation of personal and server computer systems; the physical infrastructure of local and wide area networks; the design and management of computer networks; the administration of Microsoft Windows and non-Windows server and client operating systems; the design and development of Windows-based and web-based applications; the management and design of relational databases; and the integration of enterprise software applications to solve business problems.

Upon completion of the program, graduates of the CNSA program have obtained employment in information technology as systems administrators, network administrators, network technicians, PC technicians, help desk analysts, systems engineers, structured data cabling installers, application programmers, web application developers, web administrators, database administrators, and sales engineers. High school prerequisites for this program are Algebra I & II, and a GPA of at least 2.5.

A Graduate of this Program Will be Able to:

- Solve business problems by applying sound information technology principles.
- Implement and administer a broad range of information technology systems, networks, and applications.
- Manage information technology projects from conceptualization through implementation.
- Make significant contributions as a member of an information technology team.
- Explain with authority current technologies and standards in the field.
- Maintain information technology skills through appropriate industry certifications and/or continuing education.
- Demonstrate a strong professional work ethic.
- Protect and preserve a business organization's critical information assets from all threats.



Tim Headings, Instructor
BS: Albright College
AAS: Thaddeus Stevens College of Technology

Dr. Jameson McFarlane, Professor
DSc, Towson University
MBA, BSc: York College of Pennsylvania
Certificate in Music Theory: St. Lucia School of Music
Certificate in Teacher Ed. and Ed. Adm.: Sir Arthur Lewis
Community College/University of the West Indies

Model Schedule For Computer & Network Systems Administration (Option #1)

Semester 1	
CNSA 107: PC Hardware and Support Fundamentals	3
*CNSA 111: Intro to Networking	3
*CNSA 117: Analysis of TCP/IP & Local Area Networking	3
*CNSA 123: LAN Cabling and WAN Technologies	3
†^MATH 137: Intermediate Algebra (or higher)	3
ENG 106: English Composition	3
Semester 2	
*CNSA 156: Operating Systems I	3
*CNSA 161: Systems Administration I	3
*CNSA 166: Internetworking Devices and Concepts	3
*CNSA 172: Web Technologies and Network Security Fund	3
*ENG 216: Technical Writing	3
*MATH 141: Trigonometry (or higher)	3
Semester 3	
*CNSA 212: Programming I	3
*CNSA 222: Database Management Systems	3
*CNSA 227: Management Information Systems	3
*CNSA 256: Operating Systems II	3
ENG 221: Public Speaking	3
General Studies Elective	3
Semester 4	
*^CNSA 216: Web Programming	3
*^CNSA 266: Systems Administration II	3
*CNSA 271: Network Design	3
*CNSA 276: Practical Applications	3
Humanities Elective	3
Science Elective	3
Additional General Education Requirements	
HEAL 106 or HEAL 111	1
TOTAL CREDITS	73

Model Schedule For Computer & Network Systems Administration (Option #2)

Semester 1	
CNSA 107: PC Hardware and Support Fundamentals	3
*CNSA 111: Intro to Networking	3
*CNSA 117: Analysis of TCP/IP & Local Area Networking	3
*CNSA 123: LAN Cabling and WAN Technologies	3
†MATH 207: Pre-Calculus	4
ENG 106: English Composition	3
Semester 2	
*CNSA 156: Operating Systems I	3
*CNSA 161: Systems Administration I	3
*CNSA 166: Internetworking Devices and Concepts	3
*CNSA 172: Web Technologies and Network Security Fund	3
*ENG 216: Technical Writing	3
Elective : General Studies Elective	3
Semester 3	
*CNSA 212: Programming I	3
*CNSA 222: Database Management Systems	3
*CNSA 227: Management Information Systems	3
*CNSA 256: Operating Systems II	3
ENG 221: Public Speaking	3
General Studies Elective	3
Semester 4	
*^CNSA 216: Web Programming	3
*^CNSA 266: Systems Administration II	3
*CNSA 271: Network Design	3
*CNSA 276: Practical Applications	3
Humanities Elective	3
Science Elective	3
Additional General Education Requirements	
HEAL 106 or HEAL 111	1
TOTAL CREDITS	74

* Prerequisite or Co-requisite Required. See Course Description.

† Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 137 and MATH 141, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

^ Minimum Grade Required. See Course Description.

Computer and Network Systems Administration (CNSA)

CNSA 107 (3 Credits)

PC Hardware and Support Fundamentals

This course is focused on the internal components and operation of digital devices with emphasis on desktop PC systems used for business. Processors, memory, hard drives, SSDs, communication buses, and other components are covered. Electricity fundamentals and the binary numbering system are also a part of this course. Students build a computer from scratch in the lab.

CNSA 111 (3 Credits)

Introduction to Networking

Provides an overview of modern networking arrangements and goes into detail about the digitization of analog signals, the OSI model, the Ethernet protocol, and Ethernet switching. IP addresses and IP sub-netting are also covered in depth.

Prerequisite: CNSA 107

CNSA 117 (3 Credits)

Analysis of TCP/IP and Local Area Networking

The TCP/IP protocol suite is explored in detail. Topics include ARP, ICMP, DNS, DHCP, IPv4, IPv6, and TCP operation details such as sequencing, acknowledgments, and sliding window flow control. After lecture is complete, students spend lab time capturing frames with a software protocol analyzer and verifying the behaviors they learned about in lecture. Wireless networking (WiFi) is also a part of this course.

Prerequisite: CNSA 111

CNSA 123 (3 Credits)

LAN Cabling and WAN Technologies

Cabling standards and best cabling practices in the industry are covered. Students practice hands-on cable termination of copper and fiber cables in the lab. This course also provides an overview of telecommunications technologies and the use of telecommunications in wide area networks (WANs).

Prerequisite: CNSA 117

CNSA 156 (3 Credits)

Operating Systems I

Microsoft's server operating systems are a dominant network operating system in the information technology industry. In this course, along with CNSA 161, students get detailed lecture about and hands-on experience with Microsoft's server operating system. Practical hands-on experience is included in the labs and begins with attended and unattended installation methods. Included in installation methods are imaging and cloning techniques for mass rollouts of server and client operating systems. The lecture and labs continue with configuration of file and print servers, securing files with share and NTFS permissions, disk management (including RAID), disaster recovery, and backup methods.

Prerequisite: CNSA 123

CNSA 161 (3 Credits)

Systems Administration I

This course continues where CNSA 156 leaves off. In this course, students learn about Microsoft's Active Directory structure and management. User account maintenance, user profiles, logon scripts and group policy are covered. Students also learn in the classroom what goes on behind the scenes with dynamic host control protocol (DHCP or automatic addressing) and domain name server (DNS or computer name resolution). Ultimately, students take this classroom theory and apply it in the lab as they create their own active directory domains and configure DHCP and DNS services within their domain.

Prerequisite: CNSA 156

CNSA 166 (3 Credits)

Internetworking Devices and Concepts

This is a Cisco-centric course on IP routing and switching. Traditional routers and L3 switches are discussed in the classroom and used in the lab. Routing protocols such as RIPv2, EIGRP, and OSPF are covered. In addition to routing, voice-over IP (VoIP) is a significant technology that businesses implement in order to reduce cost and leverage investments in the data network. For that reason, this course provides an overview of VoIP and assigns a lab project to configure a software private branch exchange (PBX) telephone switch that is capable of routing phone calls within the lab environment.

Prerequisite: CNSA 161

CNSA 172 (3 Credits)

Web Technologies and Network Security Fundamentals

Students learn how to configure a web server that can host multiple websites. The course then moves into the creation of web pages from scratch using HTML, CSS, and a text editor. Since security has become an increasingly important issue in our times, some of the security measures that are commonly used on the internet are included in this course. These security measures include an overview of threats and defense strategies, the public key infrastructure (PKI), digital certificates, hash codes, and digital signatures.

Prerequisite: CNSA 166

CNSA 212 (3 Credits)

Programming I

An introduction to the fundamentals of computer programming. Students learn a structured, object-oriented approach to problem solving and automating routine processes using modern programming languages. The programming concepts used emphasize logical thinking and current programming standards and conventions. Students learn to plan, design, compile, debug, and document applications in a visual programming environment using a programming language that is compatible with the Microsoft .NET Framework. In addition, the course introduces the integration of programming applications with databases as well as next generation programming environments.

Prerequisites: CNSA 156 and CNSA 161

CNSA 216 (3 Credits) **Web Programming**

A course that builds upon the information learned in CNSA 172, CNSA 212, and CNSA 222, it introduces advanced web programming and development techniques and tools. The primary focus of the course is on the design of dynamic, interactive websites, using current web programming languages and tools, including the technology of the Microsoft .NET Framework. Students integrate the use of relational databases to provide data storage and retrieval for their interactive websites. Students also configure and manage web servers to support interactive web pages.

Prerequisites: CNSA 172, CNSA 212, and CNSA 222
Minimum grade of "C" required

CNSA 222 (3 Credits) **Database Management Systems**

An in-depth, hands-on survey course in which students develop the skills and the expertise required to design, to implement, and to manage databases using a relational database management system (RDBMS). Students learn concepts of the relational database model, the principles of database design and normalization, and database administration. In addition, the basic commands and functions of structured query language (SQL) are used for data manipulation and extraction, as well as for database administration. Finally, topics are introduced that relate enterprise databases to client/server systems, application programming, web database development, and e-commerce.

Prerequisite: CNSA sophomore standing

CNSA 227 (3 Credits) **Management Information Systems**

A course that introduces students to the policies and procedures required to administer an enterprise computer network and to support an effective information technology department and users in the enterprise. Students learn how to prepare and to maintain documentation for information technology systems, software, processes, and projects. The skills learned in this course are integrated into the other CNSA courses throughout the sophomore year. An important component of the course is research, readings, and discussion related to ethical practices in the field of information technology.

Prerequisite: CNSA sophomore standing

CNSA 256 (3 Credits) **Operating Systems II**

The second operating systems course in the CNSA curriculum that introduces students to the design, functionality, and administration of the predominant non-Windows operating system in the current computer industry. At this particular time, the course presents an in-depth examination of Linux, focusing on the proper installation and administration of the operating system. Students explore the wealth of support sites available to administrators of Linux systems, as well as the availability of productivity software applications and system administration tools for Linux systems.

Prerequisite: CNSA 156

CNSA 266 (3 Credits) **Systems Administration II**

Students will also learn to implement dynamic websites using PHP HyperText Preprocessor (PHP) and MySQL. Topics include configuring PHP and MySQL; reading HTML forms, variables and strings, selections, loops, arrays, cookies and sessions, functions, and regular expressions; connecting to a MySQL database, writing basic structured query language (SQL) commands; developing applications with PHP/MySQL; and configuring Apache servers to work in conjunction with Internet Information Services (IIS) for website security.

Prerequisite: CNSA 161 and CNSA 256

Minimum grade of "C" required

CNSA 271 (3 Credits) **Network Design**

This is the first of two capstone courses in the CNSA curriculum that requires students to rely heavily upon the knowledge and skills acquired from their entire previous course experiences. Project teams manage all accounts (i.e., user, group, computer, security) in their respective domains. In designing their enterprise domains, the teams conduct appropriate research; analyze and evaluate enterprise requirements and specifications; and document the network design. Knowledge of the fundamentals of networking technology, experience supporting a network, or successful completion of a networking essentials course is required.

Prerequisite: CNSA 266

CNSA 276 (3 Credits) **Practical Applications**

The second of two capstone courses in the CNSA curriculum that requires students to rely heavily upon the knowledge and skills acquired from their entire previous CNSA course experiences. This course also includes in-depth research and examination of selected network applications and the implementation of those applications in the enterprise. Students learn how to plan, to configure, and to administer the specified application(s); how to implement the application(s); how to document the installation(s); and how to train the appropriate individuals to use and administer the application(s).

Prerequisites: CNSA 266 and CNSA 271

Computer Software Engineering Technology

What is Computer Software Engineering?

Computers have become a major factor in the development and operation of modern industry. From providing means of communications, to operating machines, to facilitating international commerce, to systems animation, computers and their related software programs makes things possible.

The Computer Software Engineering Technology program prepares students to design, to develop, and to build customized software programs for specific applications. Specifically, students will learn basic programming; how to interpret specifications; application of software architecture, verification and validation principles; and software performance standards. Students will create software programs which address known specifications. The program emphasizes a practical hands-on education as software projects are required each semester.

Upon completion of the program, graduates will find a wealth of employment opportunities in a variety of businesses and industries. Unlike some disciplines which are tied directly to a specific technical area, graduates of this program will work in small businesses, large industries, private organizations, software specialty businesses, IT department, government, and other agencies.

Job titles might include the following:

- Software designers
- Software test technicians
- Software maintenance technicians
- Technical writer for software publishing companies
- Customer service technicians for software companies

A Graduate of this Program Will be Able to:

- Edit and modify existing software programs with the aim of upgrading and correcting errors.
- Improve the performance of software programs, or adapt it to new and old hardware and software.
- Analyze the needs of users for project design.
- Design and modify software systems for specific applications
- Analyze and recommend all necessary system layouts and modifications.
- Train users how to make use of new software.

Hassan Arafat, Instructor
 MS: University of North Texas
 MBA: University of Dhaka

Zach Fedor, Instructor
 BA: Temple University

Model Schedule For Computer Software Engineering Technology

Semester 1

CSET 105: Intro to Web Applications	3
CSET 110: Web Development I	3
CSET 115: Technical Requirements & Data Structures	3
*CSET 120: Software Project I	3
MATH 137: Intermediate Algebra (or higher)	3
ENG 106: English Composition	3

Semester 2

*CSET 155 Database Design	3
*CSET 160 Web Development II	3
*CSET 170 Security & Professional Ethics	3
*CSET 180 Software Project II	3
CIS 111 Introduction to Computer Applications	3
BUSN 106 Small Business Management (Must take before CSET 210)	3

Semester 3

*CSET 205: Advanced Data Integration	3
CSET 222: Database Management Systems	3
*CSET 210: Workplace Communications	3
*CSET 220: Software Project III	3
ENG 221: Public Speaking	3
*ENG 216: Technical Report Writing	3
PHYS 106: Physics for Everyday Life OR any CHEM, BIO, SCI, or higher PHYS	3

Semester 4

*CSET 265: Software Principles	4
*CSET 270: Mobile Development	4
CSET 280: Capstone Project OR TECH 204: CSET Internship	4
HEAL 106 or HEAL 111	1
Humanities Elective	3

TOTAL CREDITS 73

** Prerequisite or Co-requisite Required. See Course Description.*



Computer Software Engineering Technology (CSET)

CSET 105 (3 Credits)

Introduction to Web Applications

The course provides an introduction to the basic tools, processes, and workflow in the development of web applications. Students will cover version control using the command line and an introduction to automated testing during development. The course meets during the first twelve weeks of the semester.

CSET 110 (3 Credits)

Web Development I

The course introduces front end web development concepts including HTML, CSS, and Javascript, and their role in building web applications. The course meets during the first twelve weeks of the semester.

CSET 115 (3 Credits)

Technical Requirements and Data Structures

The course provides information regarding the process of disseminating specifications and managing a project, as well as data structures concepts. The course meets during the first twelve weeks of the semester.

CSET 120 (3 Credits)

Software Project I

This course requires the student to complete a computer software project that employs the skills acquired during that semester. Scheduled during the last three weeks of the semester, the specific projects are those suggested by local employers and advisory committee members. Optional challenge projects are available for those students who wish to tackle complex problems.

Co-requisite: CSET 105, CSET 110, and CSET 115

CSET 155 (3 Credits)

Database Design

The course develops skills in the administration of databases. Students learn to organize data and to store the data for use and retrieval. Common systems of data storage are introduced. Students will build a database, script a process to load data, and outline how to retrieve data from that database. The course meets during the first twelve weeks of the semester.

Prerequisite: CSET 110 and CSET 115

CSET 160 (3 Credits)

Web Development II

Students will look at server-side development and build more complex web applications using their knowledge gained in CSET 110 (Web Development I). Students will have the option to choose between PHP and Ruby as their development language for labs and projects in this course. The course meets during the first twelve weeks of the semester.

Prerequisite: CSET 110 and CSET 120

CSET 170 (3 Credits)

Security and Professional Ethics

The course explores issues of security in software development. Students analyze security problems and learn how they can be minimized or controlled. Students will also cover Secure Socket Layer (SSL) protocol and learn how to apply it to their web applications. The course meets during the first twelve weeks of the semester.

Prerequisite: CSET 110 and CSET 115

CSET 180 (3 Credits)

Software Project II

This course requires the student to complete a computer software project that employs the skills acquired during that semester and previous semesters. Scheduled during the last three weeks of the semester, the specific projects are those suggested by local employers and advisory committee members. Optional challenge projects are available for those students who wish to tackle complex problems.

Prerequisite: CSET 120

Co-requisite: CSET 155, CSET 160, and CSET 170

CSET 205 (3 Credits)

Advanced Data Integration

The course is an extension to more complex data operations skills. Students will learn the principles of creating APIs, explore methods of data analysis, and integrate their applications with external platforms like Open Earth and Twitter. The course meets 16 weeks during the semester (including final exams).

Prerequisite: CSET 155, CSET 160, and CSET 170

CSET 210 (2 Credits)

Workplace Communications

Students will learn the skills associated with good communications in the workplace. Students will learn the skills necessary to be a good team member. Tenets of customer interaction will also be emphasized. The course meets 16 weeks during the semester (including final exams).

Prerequisite: BUSN 106 and CSET 170

CSET 220 (3 Credits)

Software Project III

This course requires the student to complete a computer software project that employs the skills acquired during that semester and previous semesters. The specific projects are those suggested by local employers and advisory committee members. Optional challenge projects are available for those students who wish to tackle complex problems. The course meets 16 weeks during the semester (including final exams).

Corequisite: CSET 205 and CSET 210

TECH 204 (4 credits)

Special Topics (Internship)

Special topics are selected. The topic to be studied is determined by the instructor and approved by the vice president for academic affairs. Credits earned are applicable either as free electives in the program or as credits used for graduation (with the approval of the vice president for academic affairs.)

CSET 265 (3 Credits)

Software Principles

Students will be introduced to the most fundamental concepts and principles of software that have been used in practical means throughout this program. The course may cover topics including operating systems, object-oriented principles, software design patterns, and system architecture. The course meets 16 weeks during the semester (including final exams).

Prerequisite: CSET 205 and CSET 210

CSET 270 (4 Credits)

Mobile Development

In this 16-week project-based course, students will be introduced to mobile application programming concepts and learn to build their own apps. Theory and concepts will be cross-platform, but examples and lab work will focus on one major platform. Topics will include working with Software Development Kits (SDKs), creating user interfaces, and utilizing mobile APIs such as notifications and location-based services.

Prerequisite: CSET 205 and CSET 220

CSET 280 (4 Credits)

Capstone Project

This course requires the student to complete a computer software project that employs all the skills acquired from the program. The specific projects are those suggested by local employers and advisory committee members. Optional challenge projects are available for those students who wish to tackle complex problems.

Prerequisite: CSET 205 and CSET 220



```
fetchRandom = (min, max) => {  
  return Math.floor(Math.random() * (max - min + 1)) + min;  
}  
  
const addOrder = (num, list) => {  
  return [...list, {  
    number: num,  
    topping: 'pepperoni'  
  }];  
}  
  
const drawOrders = (list) => {  
  const orderList = document.querySelector('ul');  
  
  for(let item of list) {  
    let liEl = document.createElement('li');  
    liEl.className = 'order';  
    let liElText = document.createTextNode(item.topping);  
    liEl.appendChild(liElText);  
    orderList.appendChild(liEl);  
  }  
};  
  
const addTopping = (toppings) => {  
  // ...  
}
```

Computer-Integrated Machining

What is Computer-Integrated Machining?

Students in the Computer-Integrated Machining program will spend considerable time in the study and actual operation of industrial equipment and tools to develop skills used by tool and die making companies and production and manufacturing facilities. This includes emphasis on the set up and operation of computer numerical controlled (CNC) lathes and milling machines. Students will also be introduced to computer-controlled measuring machines and computer-aided design/computer-aided machining (CAD/CAM) software and its applications. A strong project, method-driven curriculum assures both theoretical and practical skill development.

This program prepares students to enter the workforce fields of CNC, CAM, tool making, mold making, machine tool operating, quality control, industrial sales, and production or manufacturing. High school prerequisites for this program are Algebra I & II, and a GPA of at least 2.5.

A Graduate of this Program Will be Able to:

- Demonstrate safe work habits and be conscious of safety when working with machinery.
- Read blueprints, interpret drawings, understand specifications, and establish tolerances.
- Apply mathematics in the machine tool technology (speeds, feeds, thread measurement, sine bar, etc.)
- Apply the principles of physics and metallurgy to the science of heat treatment operations, including hardening of steel, carburizing, case hardening, tempering, and annealing.
- Operate basic machine tools and demonstrate knowledge of their construction in relation to the metal industry.
- Demonstrate skills on computer numerical control machines and in digital readout.
- Operate abrasive cutting machinery; select and plan machining operations on this equipment.
- Demonstrate skills in quality control, inspection, gauging methods, and production control as they relate to manufacturing design and production.
- Demonstrate basic oral communication skills, speak logically, and use various types of oral and written communication techniques to promote good business relationships, to develop leadership, and to establish good employer-employee relationships.
- Demonstrate understanding of CAD/CAM programs for part design and generation of CNC code.

Ronald C. Schwartz, Associate Professor

BA: Millersville University

AST: Thaddeus Stevens College of Technology

PA Department of Labor and Industry Journeyman Tool and
Die Maker Certification

Alex Surra, Instructor

MEd, BSE: Millersville University

AAS: Thaddeus Stevens College of Technology

Level II Teaching Certificate: Commonwealth of PA OSHA

Authorized General Industry Trainer: Mid-Atlantic OTI
Education Center

Jared Keim, Instructor

AAS: Thaddeus Stevens College of Technology



**Model Schedule For
Computer-Integrated Machining**

Semester 1

CIM 106: Blueprint Reading and Related Math	3
CIM 110: Manufacturing Processes	2
CIM 115: Measurement Systems	2
CIM 118: Lathe and Vertical Milling Machine I	4
CIM 161: Metallurgy	2
[†] MATH 137: Intermediate Algebra (or higher)	3
ENG 106: English Composition	3

Semester 2

*CIM 158: Lathe and Vertical Milling Machine II	3
*CIM 165: Machine Skills Lab I	2
*CIM 175: Computer Numerical Control I	4
*CIM 222: CAD/CAM I	3
*ENG 216: Technical Writing OR ENG 221: Public Speaking	3
*MATH 141: Trigonometry (or higher)	3

Semester 3

*CIM 208: CNC Milling I	3
*CIM 209: CNC Turning I	3
*CIM 229: Machine Skills Lab II	4
*CIM 272: CAD/CAM II	3
CIS 105: Drawing with AutoCad	3
Science Elective: ANY Physics or Chemistry Course	3

Semester 4

*CIM 228: CAE/CAM III	3
*CIM 231: Machine Tool Internship OR *CIM 257: Machine Skills Lab III (see class description)	4
*CIM 259: CNC Milling II	3
*CIM 269: CNC Turning II	3
Humanities Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
General Studies Elective	3

TOTAL CREDITS 76

** Prerequisite or Co-requisite Required. See Course Description.*

[†]Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 137 and MATH 141, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

[^] Minimum Grade Required. See Course Description.

Computer-Integrated Machining (CIM)

CIM 106 (3 credits)

Blueprint Reading and Related Math

Interpretation of industrial drawings, basic skills in sketching, and applied mathematics.

CIM 110 (2 credits)

Manufacturing Processes

Students will learn laboratory safety and material handling. The physics of metal cutting and the machinability of metals are introduced. Semi-precision and precision measuring instruments are introduced and practiced. Precision layout, bench grinding, surface grinding and power sawing operations will also be introduced and exercised.

CIM 115 (2 credits)

Measurement Systems

Students will learn basic metrology. Precision layout, indirect, and direct measurement will be included. Geometric tolerancing and how GDT features are measured will be covered.

CIM 118 (4 credits)

Lathe and Vertical Milling Machining I

This course introduces students to the lathe and vertical milling machine. Students are exposed to a wide variety of related operations.

Corequisite: CIM 106

CIM 158 (3 credits)

Lathe and Vertical Milling Machining II

Techniques and procedures taught in CIM 118 are enhanced and reinforced. This course introduces students to more advanced techniques and procedures used on the lathe and the vertical milling machine.

Prerequisites: CIM 106, CIM 110, CIM 115 and CIM 118

CIM 161 (2 credits)

Metallurgy

Covering the basic principles of metallurgy, this course clarifies many industrial processes. Students gain an understanding of quenching, annealing, case hardening, tempering, and crystallization.

CIM 165 (2 credits)

Machining Skills Lab

This is a lab intensive course which provides students with extensive hands-on training. Assigned projects aid students in gaining critical experience contributing to a well-rounded machining education.

Prerequisites: CIM 106, CIM 110, CIM 115, CIM 118, and CIM 161

CIM 175 (4 credits)

Computer Numerical Control (CNC) I

CIM 175 introduces the student to basic CNC concepts such as word-address programming, machine set-up, and program proofing. This course serves as an introduction to CNC machines and CNC programming methods and techniques. The programming and set up of a wire electro discharge machine will be covered as well.

Prerequisites: CIM 106, CIM 110, CIM 118 OR Instructor Permission

CIM 208 (3 credits)

CNC Milling I

This course expands upon introductory concepts learned in CNC I and provides for increased hands-on application of learned material. New programming techniques will focus completely on turning and the use of CNC machining centers. Students are required to complete specific laboratory work to gain confidence in working with CNC Machining Centers.

Prerequisites: CIM 158, CIM 165, CIM 175 and MATH 137

CIM 209 (3 credits)

CNC Turning I

This course expands upon introductory concepts learned in CNC I and provides for increased hands-on application of learned material. New programming techniques will focus completely on turning and the use of CNC turning centers. Students are required to complete specific laboratory work to gain confidence in working with the CNC Turning Centers.

Prerequisites: CIM 106, CIM 118, CIM 158, CIM 175 and MATH 137

CIM 222 (3 credits)

Computer-Aided Design and Computer-Aided Machining (CAD/CAM) I

This course introduces the use of MasterCAM® as a tool for defining part geometry and generating CNC machine code. Two-axis and three-axis applications are demonstrated, along with the use of the CAD/CAM applications. The AutoCAD® system is introduced as a drafting system to be linked with MasterCAM®.

Prerequisites: CIM 106 and CIM 118

CIM 228 (3 credits)

CAE/CAM III

This course teaches an intermediate level use of CAE/CAM software for generating code for use on multi-axis machine tools. Solid modeling will be introduced as a design tool as well as a method for generating NC code. This course will emphasize the connection between design and machine tool applications.

Prerequisite: CIM 272

CIM 229 (4 credits)

Machine Skills Lab II

Students complete advanced project work on lathes and milling machines during laboratory time. On the lathe, advanced threading, boring, and the use of attachments such as steady and follower rests are studied. Preparing machined parts for heat-treating and required grinding are stressed and exercised in this course.

Prerequisites: CIM 158, CIM 165, CIM 175 and MATH 137

CIM 231 (4 credits)
Machine Tool Internship

The course is a prearranged, structured learning experience scheduled within a specific time frame. The experience is relevant to an intern's academic goals and to the competencies of this program. Machine Tool Technology internships serve as a capstone experience to the academic instruction received at Thaddeus Stevens College and provide interns with an opportunity to gain practical work experience in the machining industry.

Prerequisites: CIM 208, CIM 209, CIM 229, CIM 272, and Instructor Permission.

CIM 257 (4 credits)
Machine Skills Lab III

This is a lab based course and offers hands on experience under work like conditions. In depth CNC and manual projects will build on skills acquired in previous course work. Students will be required to perform operations on both CNC and manual equipment in order to complete lab assignments. Upon successful completion of this course, students should have the necessary skills to be employed as an entry-level machinist..

Prerequisites: CIM 208, CIM 209, CIM 229, and CIM 272

CIM 259 (3 credits)
CNC Milling II

This course expands upon the intermediate concepts learned in CNC Milling I and provides more hands on experience with those techniques. New milling procedures and cycle time reduction will be the focus of this course. Students are required to complete specific laboratory work to gain confidence in working with CNC Machining Centers.

Prerequisites: CIM 208 and CIM 272

CIM 269 (3 credits)
CNC Turning II

Provides the student with additional time to perform specific advanced laboratory exercises in both programming and setup operations on the CNC Turning Centers. Programming techniques will focus completely on CNC Turning centers and will include multi-axis programming, live-tooling, and Swiss-style turning. A greater emphasis will be placed on the incorporation of CAM generated code in the production of finished parts.

Prerequisites: CIM 209 and CIM 272

CIM 272 (3 credits)
Computer-Aided Design and Computer-Aided Machining (CAD/CAM) II

This course teaches intermediate-level use of MasterCAM® as a tool for defining part geometry for both lathe and milling. Two-axis and three-axis applications are demonstrated along with the use of CAD/CAM applications. Three-dimensional surfacing and solids are taught.

Prerequisite: CIM 222



Electrical Technology

What is Electrical Technology?

Electrical Technology provides the opportunity to acquire the theory and skills needed to gain entry-level employment and advancement at an accelerated pace in the electrical field. Students will be able to apply basic electrical theory to all aspects of electrical technology. Skills and safe working habits are developed through construction and maintenance work project assignments. Since electricity has become an integral part of everyday life, an adequate supply of electrical power is necessary, as well as a reliable system for efficient utilization; thus, there is a continuing need for qualified electrical technicians.

Graduates' knowledge and skills are useful in such career areas as electrical engineering technicians, power plant technicians, electrical construction, industrial maintenance, and as technical representatives. High school prerequisites for this program are Algebra I & II, and a GPA of at least 2.5.

A Graduate of this Program Will be Able to:

- Demonstrate technical skills in a variety of electrical fields, apply these skills to new developments in these fields, and apply accepted safety standards.
- Demonstrate the ability to design, develop, and analyze electrical circuits and systems.
- Complete parts lists and order forms that demonstrate knowledge of catalogs and of coding and numbering systems for devices, hardware, and materials.
- Interpret and develop blueprints, schematic diagrams, and wiring plans and transform them into functioning projects that conform to the National Electrical Code and/or other specifications.
- Evaluate electrical circuits and systems and communicate the results of such evaluations verbally or in writing.
- Demonstrate basic knowledge of construction procedures and electrical wiring techniques.
- Demonstrate knowledge of the use of test equipment and the electrical theory used in troubleshooting, repair, and operation of circuits, systems, and equipment.
- Demonstrate knowledge of the theory and mechanics of rotating machinery, programmable controllers, transformers, and instrumentation.
- Demonstrate leadership skills.

Frederick F. Bube, Instructor
 BS: The Pennsylvania State University
 Occupational Safety and Health Administration (OSHA)
 General Industry Certification Trainer

Brian J. Kochan, Instructor
 MA: University of Maine
 BS: Millersville University
 AAS: Thaddeus Stevens College of Technology

Andrew Jacobs, Instructor
 MEd: Temple University
 BS: The Pennsylvania State University
 Electrical Apprenticeship Program: IBEW,
 Local 98 Philadelphia
 Secondary School Counselor: Immaculata University
 Occupational Safety and Health Administration (OSHA) 10
 Trainer, WVU
 NABCEP Entry Level Solar PV Installer Certification
 Program Instructor

Jon Kramer, Professor
 MEd: Alvernia University
 BS: Temple University
 AAS: Thaddeus Stevens College of Technology
 Electrical Apprenticeship: International Brotherhood of
 Electrical Workers, Local Union 743
 Vocational Instruction Teaching Certification II
 Kappa Delta Phi Honor Society, Temple University
 National Society of Collegiate Scholars, Temple University
 IAEI Certified Electrical Inspector
 Approved Occupational Safety and Health Administration
 (OSHA) General Industry Certification Trainer

Model Schedule For Electrical Technology

Semester 1

*ELEC 107: Electricity I: Theory and Analysis Lab	1
*ELEC 113: Electricity I: Theory and Analysis	4
*ELEC 117: Electricity I: Practicum	4
*ELEC 120: Electricity I: Systems Design	3
†^MATH 137: Intermediate Algebra (or higher)	3
ENG 106: English Composition	3

Semester 2

*ELEC 126: Electricity II: Systems Design	3
*ELEC 157: Electricity II: Theory and Analysis Lab	1
*ELEC 162: Electricity II: Theory and Analysis	4
*ELEC 168: Electricity II: Practicum	4
*ENG 216: Technical Writing	3
*MATH 141: Trigonometry (or higher) ^	3

Semester 3

*ELEC 211: Industrial Electronics	4
*ELEC 216: D.C. & A.C. Motors and Generators	4
*ELEC 257: Industrial Motor Control	4
*PHYS 213: General Physics I	4
CIS 111: Intro to Computer Applications	3

Semester 4

*ELEC 206: Industrial Electricity	4
*ELEC 263: Advanced Industrial Motor & Drive Control	4
*ELEC 267: Programmable Logic Controllers	4
Humanities Elective	3
General Studies Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
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TOTAL CREDITS **74**

* Prerequisite or Co-requisite Required. See Course Description.

† Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 137 and MATH 141, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

^ Minimum Grade Required. See Course Description.



Electrical Technology (ELEC)

ELEC 107 (1 credits)

Electricity I: Theory and Analysis Lab

Laboratory assignments enable students to demonstrate the theoretical topics covered in ELEC 113. Lab sessions train students to properly connect electrical circuitry and to utilize appropriate metering instruments to take specific measurements to determine voltage, resistance, current, and power, and to troubleshoot various circuit layouts.

Co-requisite: ELEC 113

ELEC 113 (4 credits)

Electricity I: Theory and Analysis

This course presents principles, laws, and formulas relating to basic direct current (DC) and alternating current (AC) applications in electricity. Topics include electron theory, magnetism, DC power supplies, Ohm's Law, Kirchhoff's Laws, AC waveform analysis and basic motor design. Resistive and inductive loads and various electrical circuit layouts are analyzed.

Co-requisite: ELEC 107

ELEC 117 (4 credits)

Electricity I: Practicum

Workshop projects enable students to develop an understanding of fundamental residential and preliminary commercial circuit design and installation in accordance with the National Electric Code (NEC) and associated building regulations.

Co-requisite: ELEC 120

ELEC 120 (3 credits)

Electricity I: Systems Design

This course is an introduction to fundamental residential and preliminary commercial wiring systems design. Topics include Occupational Safety and Health Administration (OSHA) certification; electrical and on-the-job safety; tool and material familiarization; plan design and specifications; wire diagramming; and the use of applicable National Electrical Code (NEC) standards.

Co-requisite: ELEC 117

ELEC 126 (3 credits)

Electricity II: Systems Design

This course is an advanced study in commercial and industrial electrical systems design and installation. Sizing various raceway systems for commercial and industrial applications, custom electrical enclosure sizing, and poly-phase distribution systems are reviewed in detail. Industrial process and motor control material, circuit planning and design, and AC motors sizing and wiring methods introduce students to advanced electrical control systems.

Prerequisites: ELEC 113, ELEC 117, and ELEC 120

Co-requisite: 168

ELEC 157 (1 credit)

Electricity II: Theory and Analysis Lab

Laboratory assignments enable students to analyze AC waveforms and AC circuit characteristics by connecting the appropriate electrical components and utilizing electrical measuring instruments to take specific measurements.

Computer software is used to enable advanced circuit analysis and troubleshooting.

Prerequisites: ELEC 113, ELEC 117, and ELEC 120

Co-requisite: ELEC 162

ELEC 162 (4 credit)

Electricity II: Theory and Analysis

This course presents advanced study in the principles, laws, and formulas relating to alternating current (AC) applications in electricity. Topics include AC waveform analysis, electromagnetism, power generation and distribution, vector diagrams, power factor and correction, single-phase and poly-phase systems, and motors.

Prerequisites: ELEC 113, ELEC 117, and ELEC 120

Co-requisite: ELEC 157

ELEC 168 (4 credit)

Electricity II: Practicum

This course is a hands-on approach to commercial and industrial electrical systems design and installation.

Assignments include schematic and ladder diagramming, commercial wiring and raceway systems installations, process control wiring, troubleshooting single-phase and poly-phase distribution systems, motors, and motor control circuits.

Prerequisites: ELEC 113, ELEC 117, and ELEC 120

Co-requisite: ELEC 126

ELEC 206 (4 credits)

Industrial Electricity

Theory is covered and then complemented by utilizing test benches to connect single transformers into 3-phase banks for wye and delta systems. Additional topics include determining size and bend race-ways for industrial loads, as well as becoming familiar with various hazardous areas and their requirements.

Prerequisites: ELEC 126, ELEC 157 and ELEC 162

ELEC 211 (4 credits)

Industrial Electronics

Theory and practice in basic electronic components, and single- and poly-phase rectifier circuits, including power supplies. Use of thyristors to control the average load current through machinery in industry by changing conducting time. Basics of operational amplifiers and analog and digital transducers are covered.

Prerequisites: ELEC 126, ELEC 162, and ELEC 168

ELEC 216 (4 credits)**DC and AC Motors and Generators**

Theory is complemented by utilizing a Lab-Volt dissectible machine trainer and electric motors, providing hands-on experience in disassembly, reassembly, and testing of DC, and single-phase and three-phase AC motors.

Prerequisites: ELEC 126, ELEC 162, and ELEC 168

ELEC 257 (4 credits)**Industrial Motor Control**

This course presents principles and industry standards relating to the design and installation of basic industrial motor control circuits. Additionally, the theory and operational characteristics of electrical devices utilized in control circuits are covered. Topics include electrical drawings, contactors/motor starters, basic motor control circuits (two-wire/three-wire/reversing), and control devices. A laboratory component provides students with the opportunity to design, to install, and to operate various motor control schemes/circuits.

Prerequisites: ELEC 162 and ELEC 168

ELEC 263 (4 credits)**Advanced Motor and Drive Controls**

This course presents principles and industry standards relating to the design and installation of advanced industrial motor and drive control circuits. Additionally, the theory and operational characteristics of starting/stopping and motor speed control are covered. Topics include reduced voltage starting techniques, motor speed control, and AC/DC drive controls. A laboratory component provides students with the opportunity to design, to install, and to operate various motor control schemes/circuits, as well as opportunities to troubleshoot faulted circuits.

Prerequisites: ELEC 216 and ELEC 257

ELEC 267 (4 credits)**Programmable Logic Controllers**

This course presents principles and industry standards relating to the use of PLCs used for the automation of industrial process controls. Additionally, students learn to utilize the proprietary programming software to interact with and program PLCs. Topics include PLC hardware characteristics, Boolean logic, number systems, relay-type, timing, counter and advanced PLC instructions. A laboratory component provides students with the opportunity to design, to install, and to operate various PLC-controlled processes in a simulated and hands-on environment.

Prerequisites: ELEC 211 and ELEC 257



Electro-Mechanical Technology

What is Electro-Mechanical Technology?

Electro-Mechanical Technology (or mechatronics) is one of the most in-demand and highly sought-after careers in the manufacturing industry. The combination of electrical and mechanical skills, based in computer-aided drafting and machine technology, create a unique blend of knowledge desirable to industry. These technicians are trained in a variety of skill areas, allowing companies to utilize their knowledge for a vast array of technical and mechanical issues. When necessary, industry will call on more advanced specialists, however, for the everyday issues that arise which could cost the company revenue when they occur. Having a multi-skilled technician on staff who can address issues immediately allows companies to continue production at a minimal loss. Electro-mechanical technicians have become essential positions in the manufacturing industry.

A Graduate of this Program Will be Able to:

- Disassemble machinery or equipment to remove parts and make repairs.
- Repair or replace broken or malfunctioning components of machinery or equipment.
- Repair or maintain the operating condition of industrial production or processing machinery or equipment.
- Examine parts for defects, such as breakage or excessive wear.
- Reassemble equipment after completion of inspections, testing, or repairs.
- Observe and test the operation of machinery or equipment to verify the adequacy of repairs.
- Clean, lubricate, or adjust parts, equipment, or machinery.
- Analyze test results, machine error messages, or information obtained from operators to diagnose equipment problems.
- Record repairs and maintenance performed.

Donald R.Dagen, Assistant Professor
BSME: Penn State University

Daniel Rodgers, Instructor
BS: Thomas Edison State University
AAS: Thomas Edison State University
ASNSM: Thomas Edison State University

**Model Schedule For
Electro-Mechanical Technology**

Semester 1

ELME 104: Mechanical Systems I	4
ELME 105: Manufacturing Fundamentals	4
ELME 107: Electrical Systems I	4
[†] MATH 137: Intermediate Algebra OR MATH 207: Pre-Calculus (4 credits)	3
ENG 106: English Composition	3

Semester 2

ELME 109: Programmable Logic Controllers I	4
*ELME 116: Mechanical Systems II	4
*ELME 117: Electrical Systems II	4
*ENG 216: Technical Writing	3
[*] MATH 141: Trigonometry (or higher)	3

Semester 3

*ELME 204: Mechanical Systems III	4
*ELME 208: Programmable Logic Controllers II	4
ELME 215: Robotics and Motion Control	4
*PHYS 213: General Physics I	4
General Studies Elective	3

Semester 4

ELME 214: Mechatronics Seminar & Advanced Project	4
ELME 218: Process Control & Industrial Instrumentation	4
*ELME 225: Computer Integrated Manufacturing Systems & PLCs III	4
Humanities Elective	3
General Studies Elective	3

TOTAL CREDITS **73**

** Prerequisite or Co-requisite Required. See Course Description*

[†]Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 137 and MATH 141, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

[^] Minimum Grade Required. See Course Description.



Electro-Mechanical Technology (Mechatronics) (ELME)

ELME 104 (4 credits) **Mechanical Systems I**

This course introduces the principles and applications of the most commonly found mechanical drive and fluid power components in an industrial manufacturing environment. Topics include mechanical power transmission devices, hydraulics, and pneumatics through a fundamental level along with related construction and troubleshooting techniques. All course material is supplemented with practical, hands-on exposure to the items described.

ELME 105 (4 credits) **Manufacturing Fundamentals**

This course provides students with an overview of the various types of manufacturing that take place in the discrete, hybrid, and continuous sectors and of the jobs that must be performed within manufacturing. The course provides an introduction to the techniques and resources that manufacturers employ to improve operations, preparing students for independent investigating and life-long learning. It provides basic knowledge and skills with regard to print/schematic reading, CAD drawing, measurement, and quality assurance. At least one plant tour is included as part of this course to provide firsthand validation of the topics covered.

ELME 107 (4 credits) **Electrical Systems I**

This course covers the principles and application of alternating current (AC) and direct current (DC) electricity, industrial sequential control, and electrical controls construction as found in a typical manufacturing environment. Topics include AC and DC circuit analysis and measurement in resistive, capacitive, and inductive circuits; AC fixed-speed motor control; control transformers, relays, timers, and counters; mechanical, pneumatic, and hydraulic input and output devices; sequencing and logic functions; introduction to component and systems troubleshooting; electrical wiring practices; conduit and raceways; and requirements for conductors, disconnects, and raceways as specified by the National Electric Code (NEC). All course material is supplemented with practical hands-on exposure to the items described.

ELME 109 (4 credits) **Programmable Logic Controllers I**

This course covers the principles and application of programmable logic controllers (PLCs) as found in a typical manufacturing environment. Topics include understanding the physical components that make up a PLC, basic PLC programming, and understanding the components that make up input/output, including AC/DC discrete input modules and analog input and output modules; how these modules connect to the PLC and to output devices such as motor controls, variable frequency drives, valves, and other types of machine controls.

ELME 116 (4 credits) **Mechanical Systems II**

This course covers the principles and applications of the most commonly found mechanical drive and fluid power components in an industrial manufacturing environment. Topics include mechanical power transmission devices and pneumatics and hydraulics through an intermediate level along with related construction and troubleshooting techniques. All course material is supplemented with practical, hands-on exposure to the items described.
Prerequisites: ELME 104

ELME 117 (4 credits) **Electrical Systems II**

This course covers the principles, application, troubleshooting, and maintenance of rotating electrical motors and electronic motor drives as used in industry. Topics include various types of single- and three-phase motors, various types of DC motors, reduced voltage starting, braking, DC electronic drives and AC variable frequency drives. The course builds upon the principles and applications covered in ELME 107.
Prerequisites: ELME 107

ELME 204 (4 credits) **Mechanical Systems III**

This course covers the principles and applications of the most commonly found mechanical drive and fluid power components in an industrial manufacturing environment. Topics include mechanical power transmission devices, pneumatics, and hydraulics through at an advanced level along with related construction and troubleshooting techniques. All course material is supplemented with practical hands-on exposure to the items described.
Prerequisites: ELME 104 and ELME 116

ELME 208 (4 credits) **Programmable Logic Controllers II**

This course covers the principles and application of programmable logic controllers (PLCs) featuring the IEC 61131-3 programming standard. Topics include how to install PLCs; how to configure modules; how to wire input and output modules, including temperature-sensing devices (thermocouples and resistive temperature detectors) and analog devices featuring 0–10 volts and 4–20 mA standards. The course also includes programming the built-in human-machine interface (HMI) which allows program control and status update through a built-in touch screen.
Prerequisites: ELME 109

ELME 214 (4 credits)**Mechatronics Seminar and Advanced Project**

This course provides a capstone experience for the associate of applied science degree in Electro-Mechanical Technology by requiring that students—with a teammate(s)—apply skills and knowledge from each of the program areas to an independent mechatronics project. Students develop and implement a project plan and budget approved by the instructor that demonstrates the ability to integrate the skills and knowledge obtained over the previous three semesters of study. Students work with actual industrial equipment and machinery in a realistic application. This course broadens students' knowledge with respect to technology suppliers, equipment, and applications. Students should begin planning for this course during the semester prior to the semester in which the course is completed.

ELME 215 (4 credits)**Robotics and Motion Control**

This course provides students with a background in the programming and application of industrial robots and general purpose synchronized multi-axis motion control. Expanding upon previously-learned concepts, this course examines the combination of multiple axes of motion to perform useful functions such as creating a flexible manufacturing system utilizing robots and broadens the knowledge of different programming languages to initiate and control motion sequences. Students learn how to implement electronically many of the simple machines introduced in previous courses such as gear drives, belt drives, line shafts, and cams.

ELME 218 (4 credits)**Process Control and Industrial Instrumentation**

This course covers the fundamentals of process control and instrumentation as applied in industry for the control of level, flow, temperature, and pressure. The concept of a control loop is introduced and each of the loop's components—sensor, controller, and final element—are examined. Design, documentation, operation, performance tuning, and troubleshooting of single-loop systems is discussed.

ELME 225 (4 credits)**Computer-Integrated Manufacturing Systems and PLCs III**

This course guides students through the processes of interfacing and integrating manufacturing components and unit operations into useful systems. Students work with touch screen displays (HMI) networked to programmable logic controllers. System integration is accomplished using digital input/output, DeviceNet, and TCP/IP Ethernet networking. The course involves working with a flexible manufacturing lab that includes a bar code reader, vision system, servo, and AC drive to manipulate a conveyor and other equipment to sort and fill. Prerequisites: ELME 109 and ELME 208



Electronic Engineering Technology

What is Electronic Engineering Technology?

Electronic Engineering Technology provides the opportunity to acquire the skills needed to gain employment as an engineering technician in manufacturing and industry. Skills are developed by theoretical analysis and by the use of manipulative practice in the laboratory. The program gives students a broad theoretical and practical background in analog and digital electronic circuits. Graduates of the Electronic Engineering Technology program are prepared to find employment as technicians with the ability to prototype, to test, to program, to integrate, to install, to maintain, and to repair electronic systems. Because of the use of electronics in most industries, many employment opportunities in varied environments exist. High school prerequisites for this program are Algebra I and II, and a GPA of at least 2.5.

A Graduate of this Program Will be Able to:

- Demonstrate a working knowledge of DC and AC components and circuits.
- Demonstrate a basic knowledge of solid state devices and circuits.
- Analyze, design, construct, and integrate components and circuits of various types.
- Demonstrate a basic knowledge of digital electronics, logic circuits, microprocessors, and programmable logic controls (PLCs).
- Solve math problems related to circuit analysis, digital electronics, and other systems.
- Operate standard test equipment to analyze electronic systems.
- Design and troubleshoot simple microprocessor-based systems and interface peripheral devices.
- Work with robotics and motion control systems at a basic level.
- Understand pneumatics at a basic level.
- Network PLCs and other data acquisition and control systems.
- Interface sensors and control elements to PLCs.

Thomas L. Evans, Instructor
AAS: Thaddeus Stevens College of Technology

Bruce C. Schreiner, Professor
MEd: The Pennsylvania State University
BS: Millersville University
AAS: Thaddeus Stevens College of Technology

Model Schedule For Electronic Engineering Technology

Semester 1

*EET 108: DC Fundamentals (w/lab)	4
*EET 118: AC Fundamentals (w/lab)	4
EET 128: Combinational Digital Logic (w/lab)	4
†^MATH 137: Intermediate Algebra OR MATH 207: MATH 207 Pre-Calculus (4 credits)	3
ENG 106: English Composition	3

Semester 2

*EET 158: Solid State Devices I (w/lab)	4
*EET 168: Solid State Devices II (w/lab)	4
*EET 178: Sequential Digital Logic (w/lab)	4
*ENG 216: Technical Writing	3
*^MATH 141: Trigonometry (or higher)	3

Semester 3

*EET 217: Microprocessors/Microcontrollers (w/lab)	4
*EET 222: Interfacing & Programming Microprocessors (w/lab)	4
*EET 238: Interfacing and Basic Control Circuits (w/lab)	4
*PHYS 213: General Physics I	4
Humanities Elective	3

Semester 4

*EET 258: Automation&Control Systems with PLCs I (w/lab)	4
*EET 268: Automation&Control Systems with PLCs II (w/lab)	4
*EET 278: Data Acquisition and Control Project	4
General Studies Elective	3
General Studies Elective	3

TOTAL CREDITS 73

* Prerequisite or Co-requisite Required. See Course Description.

† Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 137 and MATH 141, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

^ Minimum Grade Required. See Course Description.



Electronic Engineering Technology (EET)

EET 108 (4 credits)

DC Fundamentals (w/Lab)

Voltage, current, resistance, conductance, power, and energy are defined. Ohm's law, Kirchhoff's laws, Thevenin, Norton, and Superposition theorems are used to analyze resistive circuits. Components studied include resistors, potentiometers, bridge circuits, comparators, simple timing circuits, switches, circuit breakers, relays, h-bridges, solenoids, photo-resistors, thermistors, voltage sources, and current sources. Students build simple DC circuits based on concepts and components being studied. Electrical measurements are performed to verify proper circuit operation. Circuit construction and measurement techniques are taught. Students are trained in the use of digital multi-meters and DC power supplies as test equipment.

Co-requisites: Math 137

EET 118 (4 credits)

AC Fundamentals (w/Lab)

Waveforms, capacitors, inductors, and transformers are studied. Reactance, impedance, phase angles, and power factor are calculated. Pulse width modulation, time constants, and filters are introduced. Students build simple AC circuits based on concepts and components being studied. Wave parameters, capacitance, inductance, impedance, and phase angles are measured to verify proper circuit operation. Students are trained in the use of signal generators and oscilloscopes as test equipment.

Prerequisite: EET 108

EET 128 (4 credits)

Combinational Digital Logic (w/Lab)

Basic digital electronic concepts are covered including introduction to digital machines, number systems (binary and hexadecimal), binary arithmetic, digital signals and switching, Boolean algebra, logic gates (AND, OR, NAND, NOR, XOR, XNOR), logic gate specifications, and basic combinational logic circuits. Includes an introduction to and programming of programmable logic devices (PLDs). Circuits are built from schematics and test equipment (DVM, logic analyzer, digital signal generator, and circuit simulation software) is used to learn the operation of the circuits.

EET 158 (4 credits)

Solid State Devices I (w/Lab)

Diodes, rectifiers, power supplies, regulators BJT transistors, and transistor amplifiers are studied. Students build and test diode circuits, power supplies, transistor circuits, and amplifiers.

Prerequisites: EET 108 and EET 118

EET 168 (4 credits)

Solid State Devices II (w/Lab)

FET transistors, op amps, thyristors, opto-isolators, and solid state relays are studied. Drivers, buffers, interfacing, pre-amps, amplifiers, active filters, mixers, oscillators, and phase controllers are built and tested.

Prerequisite: EET 158

EET 178 (4 credits)

Sequential Digital Logic (w/Lab)

Comprehensive coverage of combinational and sequential logic circuits including adders, subtractors, flip-flops, shift registers, counters, digital multiplexors/de-multiplexors, and A/D and D/A conversions. Electronic equipment schematics are reviewed to develop technician-level skills. Circuits are built from schematics and test equipment (DVM, logic analyzer, digital signal generator, and circuit simulation software) is used to learn the operation of the circuits.

Prerequisite: EET 128

EET 217 (4 credits)

Microprocessors/Microcontrollers (w/Lab)

This course is an introduction to the basic architecture and instruction sets of microprocessors and microcontrollers. Learning activities include basic assembly language programming, working with programming IDE environment, software simulation tools, hardware emulation tools, and logic analysis of hardware signals. Both Harvard architecture and von Neumann architecture devices are covered.

Prerequisites: EET 128 and EET 178

EET 222 (4 credits)

Interfacing and Programming Microprocessors (w/Lab)

This course involves the interfacing of basic input and output devices at the chip level to microprocessors and microcontrollers and also includes their support ICs and common peripheral devices. Learning activities include interfacing, programming (at assembly language level) and modifying existing assembly and C language code. Test equipment—including DSOs, DVMs, logic analyzers, and data analyzers—is used in support of these activities.

Prerequisite: EET 217

EET 238 (4 credits)**Interfacing and Basic Control Circuits (w/Lab)**

This course will provide an introduction to common interfacing schemes and foundational control circuits. The student will gain insight into concepts involved in interfacing the outside world to and from a controller. The student will be introduced to basic circuits, ladder diagrams, and GUIs (graphic user interfaces) to create HMIs (human machine interfaces).

Prerequisite: Successful completion of 1st year EET courses

EET 258 (4 credits)**Automation and Control Systems with PLCs I (w/Lab)**

This course handles electronic topics from an industrial viewpoint and deals with actual control systems utilizing programmable logic controllers (PLCs), IEC-61131 programming concepts, and industrial circuits. It also serves as introduction to process control, industrial process techniques, and instrumentation. During this course, the PLC is used as the control device where possible and therefore PLC knowledge is advanced in both interfacing and programming areas.

Prerequisites: EET 108, EET 118, and EET 128

EET 268 (4 credits)**Automation and Control Systems with PLCs II (w/Lab)**

This course introduces mechanical, pneumatic, and photoelectric transducer devices used to convert all types of stimuli to electronic pulses and their use in industrial control circuits. Most activities use the PLC as the control element. Advanced ladder programming skills and higher-level language IEC-61131 programming is also covered. Industrial networking topics for control systems include RS232, TCP/IP, DH+, Modbus, DeviceNet, ASi, and other industrial networks. Motor and motion control topics include AC, DC, servo, and stepper motor operation. Motor and motion control systems are put into practical use and discussed as part of robotic systems.

Co-requisites: EET 258

EET 278 (4 credits)**Data Acquisition and Control Project**

Students create a control system of their own design. The project incorporates topics from all semesters. Programming and interfacing are implemented with an automation emphasis. Aspects include design, construction, testing, and documentation.

Prerequisite: Successful completion of first three semesters of EET courses

Co-requisites: EET 258 and EET 268



Engineering CAD Technology

What is Engineering CAD Technology?

The Engineering CAD Technology program prepares graduates for positions as entry-level CAD operators in a wide range of manufacturing and engineering industries. Skills acquired from this program of study will allow students to become an integral part of product design and the manufacturing of those products. Graduates will apply specialized knowledge and skills utilizing state-of-the-art CAD software to think critically, to solve problems, and to effectively communicate with colleagues and supervisors in today's ever-changing work environment.

From preliminary drawings and sketches, to parametric design, to animated assemblies, graduates will learn how to simplify, enhance and streamline the manufacturing and engineering processes utilizing CAD. Students acquire comprehensive skills in the following technical areas: fundamentals of drafting, technical drawing, process pipe drafting, processes of manufacturing, geometric dimensioning and tolerancing (GD&T), metals fabrication drafting, and power transmission. Students' CAD skills are developed with a comprehensive exposure to the latest software releases of AutoCAD®, Autodesk Inventor®, SolidWorks®, and Pro/Engineer®.

Upon completion of the program, graduates will find various employment opportunities in the following fields:

- CAD operator
- Cost estimator
- Drafting manager
- Drafting supervisor
- Mechanical detailer
- Mechanical design technician

A Graduate of this Program Will be Able to:

- Produce working drawings such as detail, subassembly, and full-assembly drawings utilizing manual, freehand, and computer-aided drafting techniques.
- Recognize and apply the ASME Y14.5 guidelines in the creation of mechanical working drawings.
- Apply industrial standards to the creation of working drawings of sheet-metal components, welded assemblies, electronics drafting, piping systems, and power transmission components.
- Identify and understand basic manufacturing processes as they relate to the dimensioning of working drawings.
- Demonstrate an ability to work independently and to apply interpersonal and technical skills to solve problems as a member of a multi-disciplinary team.
- Demonstrate skills and proficiency in multiple 2D and 3D solid modeling CAD software packages.

Donald Hart, Assistant Professor

AST: Thaddeus Stevens College of Technology
PCT Technical Committee, Sheet Metal
Society of Manufacturing Engineers (SME): Member
Technology Students Association (TSA):
State Conference Planning Team

James Knapp, Professor

MS: Millersville University
BS: Millersville University
American Design Drafting Association (ADDA): Member
Society of Manufacturing Engineers (SME): Member
International Technology and Engineering Education
Association (ITEEA): Member
Technology Students Association (TSA):
State Event Coordinator
State Conference Planning Team
Epsilon Pi Tau (EPT) Honor Fraternity: Laureate Member



**Model Schedule For
Engineering Cad Technology**

Semester 1

ECAD 105: Fundamentals of Machining	3
*ECAD 112: Technical Drawing	3
*ECAD 120: Intro to AutoCAD Applications	3
*ECAD 130: Advanced AutoCAD Applications	3
[†] MATH 137: Intermediate Algebra (or higher)	3
CIS 211: Microsoft Excel	3

Semester 2

*ECAD 150: Intro to AutoDesk Inventor Applications	3
*ECAD 160: Advanced AutoDesk Inventor Applications	3
*ECAD 168: Process Pipe Drafting	3
*ECAD 171: Processes of Manufacturing	3
ENG 106: English Composition	3
*MATH 141: Trigonometry (or higher)	3

Semester 3

*ECAD 207: Geometric Tolerancing	3
*ECAD 211: Metals Fabrication Drafting	3
*ECAD 220: Intro to Solid Works Applications	3
*ECAD 230: Advanced Solid Works Applications	3
*ENG 216: Technical Report Writing	3
PHYSICS : Any Physics Elective	3

Semester 4

*ECAD 250: Introduction to Pro/Engineer Applications	3
*ECAD 260: Advanced Pro/Engineer Applications	3
*ECAD 266: Working Drawings	3
*ECAD 271: Power Transmission	3
ENG 221: Public Speaking	3
Humanities : Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
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TOTAL CREDITS 73

* Prerequisite or Co-requisite Required. See Course Description.

[†]Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 137 and MATH 141, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

[^] Minimum Grade Required. See Course Description.

Engineering CAD Technology (ECAD)

ECAD 105 (3 Credits)

Fundamentals of Machining (3 credits)

This course introduces students to common machine tools and processes. Students are exposed to the various hand and power tools as well as the vertical mill, engine lathe, and the surface grinder.

ECAD 112 (3 Credits)

Technical Drawing

A study of orthographic projection and drawing creation with applications in multi-view drawings including sectioning and auxiliary views. Techniques in pictorial drawing are also used to convey orthographic views as pictorial representations.

Co-requisites: ECAD 105 and ECAD 120 or instructor approval

ECAD 120 (3 Credits)

Introduction to AutoCAD® Applications

A practical application of 2D orthographic skills utilizing AutoCAD® integrating knowledge of software commands with drafting standards. Students also experience dimensioning styles, templates, and symbols libraries. During the course, students create a series of mechanical drawings.

Co-requisites: ECAD 105 and ECAD 112 or instructor approval

ECAD 130 (3 Credits)

Advanced AutoCAD® Applications

An advanced application of 2D orthographic skills utilizing AutoCAD® integrating knowledge of software commands with drafting standards. Students also experience advanced 2D commands, system variables, symbols libraries, attributes, customization, and macros. During the course, students create a series of mechanical working drawings packets.

Prerequisite: ECAD 120 or instructor approval

ECAD 150 (3 Credits)

Introduction to AutoDesk Inventor® Applications

An AutoCAD Inventor® applications course with an emphasis on solid modeling parts and basic assemblies and the transition from 3D solid models to 2D working drawings.

Prerequisite: ECAD 130 or instructor approval

ECAD 160 (3 Credits)

Advanced AutoDesk Inventor® Applications

An advanced AutoDesk Inventor® applications course with an emphasis on advanced modeling of parts, advanced assemblies, and working drawings and the generation of 2D working drawings from the solid models. Add-on packages such as pipe and tube, sheet metal, weldments, and wire harness diagrams are explored.

Prerequisite: ECAD 150 or instructor approval

ECAD 168 (3 Credits)

Process Pipe Drafting

An intermediate drafting course covering the topics appropriate for reading and creating the working drawings necessary to instruct in the assembly of piping and equipment for industrial processes. Students are also exposed to cable and harness drafting and the process in which drawings are created.

Co-requisites: ECAD 150 and ECAD 160 or instructor approval

ECAD 171 (3 Credits)

Processes of Manufacturing

An introduction to the processes commonly employed in the conversion of raw materials into finished products. This course provides students with a solid understanding of the operations necessary to cast, mold, form, separate, condition, assemble, and apply surface finishes to manufactured products.

Prerequisite: ECAD 105

Co-requisite: ECAD 150 or instructor approval

ECAD 207 (3 Credits)

Geometric Tolerancing

A study of the American Society of Mechanical Engineers (ASME) dimensioning guidelines including geometric dimensioning and tolerancing (GD&T). This course emphasizes the creation and usage of the drafting symbols necessary to define the form, fit, and function of mechanical components.

Co-requisite: ECAD 211

ECAD 211 (3 Credits)

Metals Fabrication Drafting

An intermediate drafting course covering the topics pertinent to reading and creating the working drawings necessary to instruct welders and metal fabricators in the creation of welded assemblies. This course includes a thorough review of industrial welding drafting practices and practical applications of the symbols required to specify them in an assembly.

Prerequisite: ECAD 171

Co-requisite: ECAD 207 or instructor approval

ECAD 220 (3 Credits)

Introduction to SolidWorks® Applications

Introduces students to the essential applications with an emphasis on how to use the SolidWorks® mechanical design software to build parametric models of parts and assemblies and how to make drawings of those parts and assemblies.

Prerequisites: ECAD 112 and ECAD 160 or instructor approval

ECAD 230 (3 Credits)**Advanced SolidWorks® Applications**

Advanced SolidWorks® applications course focuses on developing skills central to the successful use of SolidWorks® parametric software. It is designed for SolidWorks users who have mastered the basics of parametric solid model design but who need to continue building skills for working with imported models, surface modeling, and an introduction to finite element analysis (FEA) using simulation software and model analysis.

Prerequisite: ECAD 220 or instructor approval

ECAD 250 (3 Credits)**Introduction to Pro/Engineer® Applications**

Introduces students to the essential applications that focuses on learning core-modeling skills in this comprehensive, hands-on course. Topics include sketching, part modeling, assemblies, drawings, and basic model management techniques. The course also includes a comprehensive design project that enables to practice new skills by creating realistic parts, assemblies, and drawings.

Prerequisite: ECAD 230 or instructor approval

ECAD 260 (3 Credits)**Advanced Pro/Engineer® Applications**

Focuses on developing skills central to the successful use of Pro/Engineer® parametric software. It is designed for Pro/Engineer® users who have mastered the basics of parametric solid model design but who need to continue building skills for working with imported models, surface modeling, sheet metal models and mechanism design which permits users to animate their assemblies in a mechanical fashion. Other skills covered are simplified reps, top-down design, flexible components, shrink-wrap feature, skeleton models, layouts, and advanced drafting commands.

Prerequisite: ECAD 250 or instructor approval

ECAD 266 (3 credits)**Working Drawings**

An advanced drafting course emphasizing the practices necessary to produce detail, sub-assembly, and full assembly mechanical drawings for industrial applications.

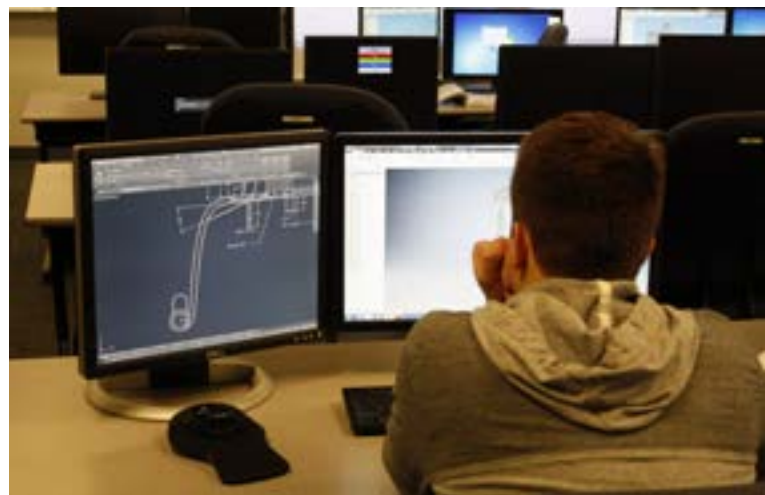
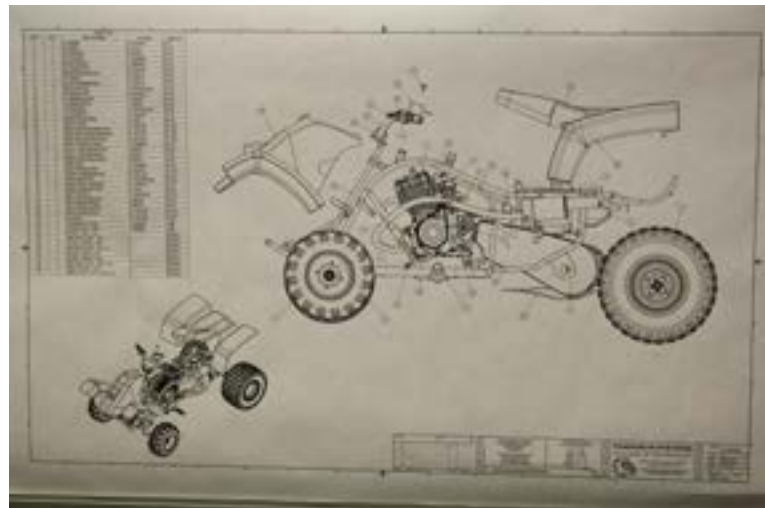
Co-requisite: ECAD 271 or instructor approval

ECAD 271 (3 credits)**Power Transmission**

A study of power transmission fundamentals, the related computations, and drafting methodologies. Applications include drafting standards for utilizing bushings, keys, sheaves, belts, chains, clutches, and conveyor pulleys in working assembly drawings.

Prerequisites: MATH 137 and MATH 141

Co-requisite: ECAD 266 or instructor approval



Graphic Communications & Printing Technology

What is Graphic Communications and Printing Technology ?

The Graphic Communications and Printing Technology program provides a comprehensive understanding of the printing process and related fields. The student receives training in all major areas, with preparation to enter one of several printing fields, depending on interest and ability.

Graduates with technical and mechanical interests find employment in desktop publishing, pre-press, presswork, and bindery operations. Skills in computer operations, electronics, photography, chemistry, and physics will also be useful in these areas.

Graduates with good English and math skills will find employment in proofreading, estimating, production planning, and sales. Those students with artistic talent may enter layout and design, advertising, or commercial art.

A Graduate of this Program Will be Able to:

- Recognize the major printing processes and their products as well as the advantages of each process.
- Demonstrate the skills needed for entry-level positions (as advanced trainees) in the following areas: layout and design, copy preparation, desktop publishing, film assembly and plate processing, direct-to-plate applications, press operations, and bindery operations.
- Assess personal strengths and limitations in various areas of the graphic arts.
- Demonstrate good work habits: Promptness to class, willingness to work, and the ability to accept supervision.
- Demonstrate knowledge of equipment and use appropriate safety precautions.
- Understand the various production departments and the contributions each makes to the finished product.
- Write clear, concise, legible, and accurate technical reports using standard grammatical English.
- Demonstrate skill in basic verbal communication.
- Solve basic math problems related to printing operations.

Michael Brady, Assistant Professor
 BS: Walden University
 AAS: Thaddeus Stevens College of Technology

Megan Zettlemoyer, Instructor
 BFA: Fashion Institute of Technology

Model Schedule For Graphic Communications & Printing Technology

Semester 1

GRPH 116: Introduction to Desktop Publishing	4
GRPH 120: Digital Photography	3
[^] GRPH 126: Printing Processes I	4
CIS 111: Intro to Computer Applications	3
ENG 106: English Composition	3

Semester 2

*GRPH 150: Intro to Lithography	3
*GRPH 155: Intro to Screen Printing	3
GRPH 160: Graphic Communications I	3
*GRPH 165: Multimedia and Web Design	3
CIS 211: Microsoft Excel	3
ENG 221: Public Speaking OR	
*ENG 216: Technical Writing	3

Semester 3

GRPH 207: Bindery and Finishing	3
GRPH 214: Print Marketing	3
*GRPH 222: Graphics Communicatons II	3
*GRPH 228: Printing Processes II	3
MATH 111: Business Math (or higher)	3
Humanities Elective	3

Semester 4

*GRPH 258: Advanced Lithograrphy	3
GRPH 262: Color Theory	3
*GRPH 267: Graphics Communications Studio	3
*GRPH 272: Web Design	3
Science Elective	3
General Studies Elective	
(May Not Take ARTS 106 Digital Photography)	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
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TOTAL CREDITS **72**

** Prerequisite or Co-requisite Required. See Course Description.*

[^] Minimum Grade Required. See Course Description.



Graphic Communications & Printing Technology (GRPH)

GRPH 116 (4 credits)

Introduction to Desktop Publishing

Introduction to the hardware and software used in desktop publishing. Topics include graphical user interface and current industry uses such as design, layout, typography, illustration, and imaging. Students receive hands-on training in the computer environment using current production software. Basic scanning techniques are demonstrated.

GRPH 120 (3 Credits)

Digital Photography

This course covers basic digital camera use through practical application. The assignments center on composition, lighting, and the use of digital photography within the graphic communications industry. Color theory and digital manipulation allow students to integrate their digital photographs into page layout and graphic design concepts.

GRPH 126 (4 credits)

Printing Processes I

Covers the various printing processes including offset, screen, flexo, and gravure. Career opportunities, salary potential, and the role each process plays in the industry today are also discussed. Safety procedures and operations are identified. Upon completion, students should be able to demonstrate an understanding of the major characteristics, advantages, and disadvantages of each process. "Minimum Grade of "C" required"

GRPH 150 (3 credits)

Introduction to Lithography

This course introduces students to the basic fundamentals of lithography. Through practical application, students develop a working knowledge of this printing process with a strong concentration into multi-color image reproduction and image registration.

Prerequisite: GRPH 126; minimum grade of "C" required

GRPH 155 (3 credits)

Introduction to Screen Printing

This course introduces students to the basic fundamentals of screen printing. Through practical application, students develop a working knowledge of this printing process with a strong concentration into multi-color image reproduction and image registration.

Prerequisite: GRPH 126; minimum grade of "C" required

GRPH 160 (3 credits)

Graphic Communications I

Covers the history, development, and commercial applications of printing processes. Students learn about the curriculum and the industry including its processes, products, and careers. Emphasis is placed on the attributes which are most desirable for successful entry and advancement.

GRPH 165 (3 credits)

Multimedia and Web Design

Introduces the fundamentals of design and production for presentations and the World Wide Web. Basics of hypertext markup language (HTML), the use of authoring software, and making portable data format (PDF) documents for internet downloads and multimedia basics are covered.

Prerequisite: GRPH 120; minimum grade of "D" required

GRPH 207 (3 Credits)

Bindery and Finishing

Bindery and finishing is an increasingly important part of the printing process as it can provide unique physical characteristics to a finished product. Students develop an understanding of both the physical processes of bindery and finishing, along with understanding the creative application and added value these processes can provide to a final piece. Along with theory, students have the opportunity to operate folding equipment, produce die cuts, and create varnishes

GRPH 222 (3 Credits)

Graphic Communications II

This course provides an overview of the history of graphic communications, along with an in-depth analysis of what graphic communications is and how it reflects culture. Typography is a primary focus in this course. Students are challenged to develop creative solutions to problems using different techniques for developing ideas.

Prerequisite: GRPH 160

GRPH 214 (3 Credits)

Print Marketing

Commercial printers no longer simply provide a printed piece. They provide various solutions to communicating messages through different techniques along with the management of data. This course looks at how print is used to connect companies to consumers through trends in marketing.

GRPH 228 (3 Credits)
Printing Processes II

In a continuation of GRPH 126, the major printing processes are discussed in greater detail, primarily offset printing. Students are introduced to multiple unit-offset press, press settings, and press troubleshooting. The aspects of paper and ink are discussed. An emphasis is placed on creating print ready files following industry specifications.

Prerequisite: GRPH 126

GRPH 262 (3 Credits)
Color Theory

Color theory is the study of the science of color and light as it relates to the printing industry. Several color spaces are discussed, along with the usage for each. A focus is placed on managing color within the printing industry by means of devices, software, and techniques.

GRPH 258 (3 Credits)
Advanced Lithography

In this course, printing standards and quality control metrics for process color printing are examined. Students continue to expand their knowledge of the inner workings of an offset press using a press simulator program. The use of printing in marketing is also discussed.

Prerequisite: GRPH 228

GRPH 267 (3 Credits)
Graphic Communications Studio

Communication skills are challenged to create unique solutions for a host of design problems. Emphasis is placed on the design process and working with others to craft a message. The course ends with a cumulative capstone project tasking students to design and produce several products. Students are also tasked with the creation of a portfolio.

Prerequisite: GRPH 222

GRPH 272 (3 Credits)
Web Design

The primary languages needed for web development, HTML and CSS, are introduced along with how to design for the web

Prerequisite: GRPH 165



Heating, Ventilation, & Air Conditioning/Refrigeration

What is HVAC/R?

The HVAC/R program is unique because it treats designing, retrofitting, testing, and balancing on a problem-solving level. This specialized program prepares the technician for the fast-growing, highly technical HVAC/R field.

The challenge for the service technician is to optimize the service operation of HVAC/R systems to maximize customer and employer satisfaction. Using computers to replicate various conditions that could be encountered, students develop a plan of action to use with live work.

Students learn current methods of identifying and performing efficiency evaluations on various types of heating, ventilation, and air-conditioning systems as well as adjusting and balancing equipment for maximum performance.

In addition to HVAC/R classroom theory sessions, students also perform service and installation on numerous live projects on and off campus. The HVAC/R laboratory includes tools, equipment, computers, and instrumentation typically found in commercial, residential, and industrial settings. The lab also includes ground source heat pumps, gas efficient furnaces, regular heat pumps, oil-fired furnaces, gas and oil boilers, ice machines, walk-in boxes, roof-top equipment, chiller systems, and commercial refrigeration trainers.

Challenging careers abound on a national level with firms offering graduates a variety of positions as service technicians, installation technicians, estimators, and in-plant industrial technicians. High school prerequisites for this program are Algebra I & II, and a GPA of at least 2.5.

A Graduate of this Program Will be Able to:

- Demonstrate the ability to do technical work in a variety of heating, cooling, plumbing, and refrigeration fields; apply safety standards and understand and work with technical developments in the industry.
- Apply concepts of algebra and physics in the layout, design, development, and analysis of refrigeration and air conditioning equipment and systems.
- Identify and demonstrate correct use of tools, materials, and equipment used in the trade.
- Demonstrate the ability to read and interpret blueprints and use blueprints when installing equipment.
- Troubleshoot heating, cooling, and refrigeration equipment using standard troubleshooting procedures.
- Write clear, concise, legible, and accurate technical reports using technical English and apply verbal communication skills in job-related activities.
- Read and interpret electrical schematics and use schematics when installing and repairing equipment.
- Estimate the cost of an installation and design and lay out an effective system for a specific location and use.
- Demonstrate knowledge of the operation and use of hermetic, reciprocating, and centrifugal compressors.
- Apply basic knowledge of airflow, ventilation, and energy conservation concepts to the design of systems, using modern building design and solar energy technology.

Matthew Bixler - Instructor

AAS: York Technical Institute

Ty Christman - Instructor

AAS: Washtenaw Community College

Bart Heagy - Instructor

CTE Certification: Temple University

Timothy Strunk, Assistant Professor

AES (Refrigeration & HVAC): Reading Area
Community College

AAS (Pennsylvania Vocational Education II Certificate):
Temple University

Barry Walters - Instructor

AAS: Gateway Technical College



Model Schedule For HVAC-R

Semester 1

HVAC 122: OSHA Electrical and Construction Safety	1.5
HVAC 126: Electrical Fundamentals for HVAC/R	1
HVAC 130: Electrical Components for HVAC/R	1
HVAC 134: Electrical Circuits for HVAC/R	1
HVAC 138: Lab Practice I: Electrical Applications	2
HVAC 142: HVAC Installation Procedures	1.5
HVAC 146: Lab Practice II: Installation Procedures	2
HVAC 150: Principles of Refrigeration	3
*MATH 126: Technical Math I (or higher)	3
ENG 106: English Composition	3

Semester 2

HVAC 155: Residential Heating Systems	2
HVAC 160: Lab Practice III: Heating Applications	2
HVAC 167: Refrigerant System Components	2
HVAC 170: Lab Practice IV: Cooling Applications	2
HVAC 175: Refrigerant Management	2
HVAC 180: Mechanical Codes for HVAC/R	1
*MATH 132: Elementary Geometry (or higher)	3
ENG 221: Public Speaking OR	
*ENG 216: Technical Writing	3

Semester 3

*HVAC 206: Air Conditioning Systems	4
HVAC 211: Heat Pump Systems	3
HVAC 216: Systems Installation and Start Up	3
HVAC 221: Commercial Refrigeration	3
Science Elective	3
CIS 105 OR CIS 111	3

Semester 4

HVAC 256: Load Calculations	3
HVAC 261: Controls of HVAC	3
HVAC 266: Ventilation	3
HVAC 271: System Servicing and Troubleshooting	3
Humanities Elective	3
General Studies Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
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TOTAL CREDITS	74
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* Prerequisite or Co-requisite Required. See Course Description.

†Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 126 and MATH 132, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

Heating, Ventilation & Air Conditioning/Refrigeration (HVAC)

HVAC 122 (1.5 credits)

OSHA Electrical and Construction Safety

This course is designed to meet the requirements that all service technicians must have for training in the rules and regulations of Occupational Safety and Health Administration (OSHA) Construction Safety and Building Maintenance Electrical Safety. Emphasis is on the requirements for compliance, identifying a proper lock-out/tag-out policy, and procedures a technician should follow for safe electrical work.

HVAC 126 (1 credit)

Electrical Fundamentals for HVAC/R

This course is designed to provide the basic knowledge of electrical theory as it pertains to the HVAC/R industry. The course emphasizes the basic electrical laws and definitions, generation and distribution of electrical power, function of controls and loads, and electrical measurements and testing.

HVAC 130 (1 credit)

Electrical Components for HVAC/R

This course exposes students to common HVAC/R system motors and controls. Emphasis is placed on the fundamentals of electrical theory as it pertains to the application and operation of motors, relays, thermostats, pressure switches, and other basic controls.

HVAC 134 (1 credit)

Electrical Circuits for HVAC/R

This course teaches commonly used electrical circuits of the HVAC/R industry as a foundation for a technician to install, troubleshoot, and service equipment. The emphasis is on drawing wiring diagrams, using schematics to install and to wire basic electrical components, and using schematics to test and to troubleshoot electrical circuits.

HVAC 138 (2 credits)

Lab Practice I: Electrical Applications

Practical experience is provided to apply the theory learned concerning electrical components and controls of the HVAC/R industry. Students demonstrate the proper electrical installations for basic A/C and heating equipment. Emphasis is placed on the installation, testing and start-up operation of motors, relays, thermostats, pressure switches, and other basic controls.

HVAC 142 (1.5 credits)

HVAC Installation Procedures

This course introduces the basic methods, tools, and materials needed for the installation of the HVAC/R equipment to students. A foundational study of the purpose of various tools and skills necessary for their safe use is emphasized. Materials and joining methods of various piping, tubing, wiring, and ductwork systems as used in this industry is studied.

HVAC 146 (2 credits)

Lab Practice II: Installation Procedures

This course provides the practical hands-on skill training. Piping practice utilizes various refrigeration trainers and a selection of commonly used A/C and heating equipment. Residential duct systems are installed on working systems. Practice is provided for the development of skills needed for various methods of joining copper tubing, stainless steel natural-gas tubing, plastic, and iron pipe.

HVAC 150 (3 credits)

Principles of Refrigeration

This course provides a study of the basic principles of thermodynamics as applied to the refrigeration cycle. The Mollier diagram is used to display the purpose and operation of the various components used in the system at expected standard operating conditions. The lab portion provides practice in measuring various system performances.

HVAC 155 (2 credits)

Residential Heating Systems

This course provides a basic understanding of different types of oil and natural gas residential heating systems. Emphasis is on proper installation, sequence of operation, and proper maintenance requirements.

HVAC 160 (2 credits)

Lab Practice III: Heating Applications

This lab time provides the hands-on training pertaining to residential heating systems. Typical residential heating systems is utilized in the lab experience to master the skills necessary for proper installation and service. Students practice typical annual servicing, combustion analysis, and efficiency testing of fossil fuel heating systems.

HVAC 167 (2 credits)

Refrigerant System Components

Introduction to residential and light commercial A/C system components. This course details the following components of air conditioner and refrigeration systems: Evaporators, condensers, metering devices, compressors, and other safety and servicing system components. Emphasis is placed on applying the knowledge gained in HVAC 150, along with manufacturer specifications, to determine proper installation and operating conditions of these cooling system components.

HVAC 170 (2 credits)

Lab Practice IV: Cooling Applications

This lab provides the hands-on training for skills necessary to properly install and start-up comfort cooling systems. Students are required to assemble a refrigeration system and test it for proper operation under various conditions.

HVAC 175 (2 credits)
Refrigerant Management

This course is designed to give students the knowledge to understand the laws on venting and handling of the various refrigerants covered in the Clean Air Act–Section 608. A requirement for this course is to take the EPA Technician Certification Exam provided by ARI. Lab practice is provided in refrigerant recovery, recycling, evacuation, and charging various small appliances and high pressure appliances.

HVAC 180 (1 credit)
Mechanical Codes for HVAC/R

This course introduces HVAC/R students to the current International Code Council (ICC) codes. The emphasis highlights the sections of these codes that are relevant to the technician for proper HVAC/R equipment installation. A brief overview of other national and local building codes is also provided.

HVAC 206 (4 credits)
Air Conditioning Systems

Air conditioning benefits, unitary cooling, unitary combination cooling and heating equipment, central station systems, service and problem analysis, and absorption refrigeration system topics are studied.

Prerequisites: HVAC 150

HVAC 211 (3 credits)
Heat pump Systems

Covers basic principles, components, and application of heat pump systems.

HVAC 216 (3 credits)
System Installation and Start Up

Codes and standards, heating start-up, heating checkouts, heating operation, AC start-up, AC checkouts, AC operation, heat pump start-up, heat pump checkouts, and heat pump operation are covered.

HVAC 221 (3 credits)
Commercial Refrigeration

Discusses system applications, refrigerated storage, and ice machines.

HVAC 256 (3 credits)
Load Calculations

Covers refrigeration, psychometrics, heating load, and cooling load calculations.

HVAC 261 (3 credits)
Controls of HVAC

Topics include controls, valves, regulators, sensing devices/ fuel controls, residential control systems—heating/cooling, commercial and engineered control systems, and heat pump controls.

HVAC 266 (3 credits)
Ventilation

Students learn about air flow principles/duct design, mechanical and electronic filtration, and fans.

HVAC 271 (3 credits)
System Servicing and Troubleshooting

Refrigeration system problems, electrical troubleshooting, heating service/problem analysis, heat pump service/ problem analysis, and AC service/problem analysis are covered.

Masonry Construction Technology

What is Masonry Construction Technology?

Masonry Construction Technology provides the opportunity to develop the skills of a proficient mason, from the simple spreading of mortar to the complex construction of an inside fireplace. These skills are developed by practice projects, which are preceded by theory lectures and demonstrations. Faculty members show films on various aspects of the trade, and students take field trips to learn about the manufacture of masonry products.

Since a large part of masonry work is decorative as well as functional, special emphasis is placed on appreciation of the beauty and permanence of brickwork and on the development of pride in good workmanship.

Students find employment in the field as masons and with experience, as forepersons or superintendents. Many masons are self-employed.

A Graduate of this Program Will be Able to:

- Operate masonry tools and equipment safely and effectively.
- Use masonry terminology.
- Read blueprints to estimate materials quantity and pricing.
- Lay out and construct footings and build a block foundation.
- Apply brick veneering to a structure.
- Construct a masonry arch.
- Lay out and set ceramic tile.
- Construct an inside fireplace and chimney.
- Repair older masonry structures.
- Organize personnel and materials at a construction site.
- Provide all masonry options in current residential construction.

Michael T. Gardner, Instructor
AAS: Thaddeus Stevens College of Technology

Chad Hummel, Instructor
AAS: Thaddeus Stevens College of Technology



Model Schedule For Masonry Construction Technology

Semester 1

MASN 101: Intro to Tools, Safety, and Equipment	3
MASN 105: Introduction to Masonry Construction	3
MASN 110: Development of Masonry Materials	3
MASN 116: Chimney Construction	3
†MATH 126: Technical Math I (or higher)	3
ENG 106: English Composition	3

Semester 2

MASN 155: Block Construction, Bearings & Anchoring Systems	4
MASN 158: Adhered Concrete Masonry Veneer	2
MASN 162: Masonry Hardscaping Patio & Retaining Walls	2
MASN 167: Masonry Restoration and Building Maintenance	3
MASN 171: Concrete Sidewalks	1
*MATH 132: Elementary Geometry (or higher)	3
CIS 111: Intro to Computer Applications OR CIS 105: Drawing with AutoCad	3
HEAL 111: Basic First Aid	1

Semester 3

MASN 207: Advanced Masonry Applications	5
MASN 211: Planning and Management	2
MASN 216: Blueprint Reading and Estimating	4
ENG 221: Public Speaking OR *ENG 216: Technical Writing	3
Science : Elective	3

Semester 4

MASN 256: Fireplace Construction	4
MASN 261: Arch Construction	3
MASN 266: Tile Setting	2
MASN 271: Footings and Foundations	3
Humanities Elective	3
BUSN 106: Small Business Mangement	3

TOTAL CREDITS 72

* Prerequisite or Co-requisite Required. See Course Description.

†Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 126 and MATH 132, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

Masonry Construction Technology (MASN)

MASN 101 (3 credits)

Introduction to Tools, Safety and Equipment

Students will be introduced to the tools required for the masonry trade, understand safety standards and practices, and receive training and certifications on various equipment used on a job site.

MASN 105 (3 credits)

Introduction to Masonry Construction

This course will teach the fundamentals of the masonry trade. This will include spreading mortar and striking full joints, laying brick and block to the line, bonding the length and height of a wall, building leads, and hanging a corner pole.

MASN 110 (3 credits)

Development of Masonry Materials

History and the manufacturing of masonry materials. In the manufacturing of materials, there are many different types of brick and block. Students will learn the various names and where the material should be used in a wall. Portland cement comes in different forms and how to properly mix the different types. Students will learn what the different strengths of cement and where they should be used.

MASN 116 (3 credits)

Chimney Construction

Students will understand the difference between and be able to construct properly a single and double flue chimney.

MASN 155 (4 credits)

Block Construction, Bearings, and Anchoring Systems

Students will learn terminology; the placement of anchor bolts, bearing plates, setting lintels, cutting in electrical boxes and door ties. They will be working around conduit, duct work and rebar reinforcement. They will also build a composite wall using block and brick.

MASN 158 (2 credits)

Adhered Concrete Masonry Veneer

Students will learn to use the tools and equipment for installing veneer stone; to apply hanging wire, scratch coat, flashings, vapor barriers, and drain mats; to hang stone; and to point the mortar joints. Students will learn the different types of patterns stone can be laid in.

MASN 162 (2 credits)

Masonry Hardscaping Patios & Retaining Walls

The proper use of masonry products in an outdoor environment. Understand the process to build an outdoor patio and retaining walls using masonry materials.

MASN 167 (3 credits)

Restoration and Building Maintenance

Cover the various materials that go along with masonry products. These would be caulking, waterproofing, patching, repointing, cutting out and repairing damaged areas, and cleaning of masonry. This course will focus on preventive maintenance to stop any further damage of the masonry structure.

MASN 171 (1 credit)

Concrete Sidewalks

Students will learn how to build forms and how to place concrete for a sidewalk.

MASN 207 (5 credits)

Advanced Masonry Applications

Application of skills relative to masonry systems. Includes working on the off-campus housing project. Techniques include firewall construction, brick veneering, porch/patio and step construction, and proper preparation for varying weather conditions.

MASN 211 (2 credits)

Planning and Management

Organizing personnel and materials on a job site; planning and coordinating the placement of equipment and materials; and completing a job on time and within budget. Supervisory duties and responsibilities are also covered.

MASN 216 (4 credits)

Blueprint Reading and Estimating

Basic skills to interpret residential construction drawings. Emphasis on calculation of materials, labor, and equipment necessary to complete selected projects. Proposals and closed bids required.

MASN 256 (4 credits)
Fireplace Construction

Provides history, theory, and function of the fireplace. Students design and construct a fireplace of their choice with emphasis on proper terminology, workmanship, and various components of different fireplaces.

MASN 261 (3 credits)
Arch Construction

Provide the skills necessary to build various types of arches. Terminology, different types, and various techniques used in the construction of arches are taught.

MASN 266 (2 credits)
Tile Setting

The basics of ceramic tile setting are covered. Emphasis is placed on terminology, tools, safety, and proper layout.

MASN 271 (3 credits)
Footings and Foundations

Provides the opportunity to layout and construct a residential concrete block foundation. Topics include blueprint interpretation, materials estimating, installation of anchor bolts, partition construction, and the use of the transit for site layout.



Mechanical Engineering Technology

What is Mechanical Engineering Technology?

The Mechanical Engineering Technology program prepares graduates for entry-level employment in the mechanical engineering field. The skills acquired from this course of study allow the student to visualize objects in three dimensions, describe objects with manual and computer-aided drafting (CAD) techniques, and apply mechanical engineering principles to design products, tools, and equipment for a manufacturing-oriented industry. The program's affiliations with industry are maintained through an advisory committee and the Society of Manufacturing Engineers (SME).

The student's skills are developed with a comprehensive exposure to the concepts of orthographic projection, sectioning, and isometric drawing with an emphasis on instrument drawing techniques. A thorough understanding of geometric dimensioning and tolerancing (GDT) and a demonstrated proficiency with the latest CAD software complement these skills. Additional training in fabrication principles, mechanical design, product design, and manufacturing processes provides a well-rounded experience with mechanical design and manufacturing technology.

The principles of mechanical engineering are mastered by studying the motion of mechanical objects and the underlying concepts required to understand how a machine functions or a manufacturing process is performed. By studying the practical aspects of structured programming, parametric feature-based design, and solid modeling, the student gains the skills necessary to utilize the computer as a design tool. Further studies in fluid mechanics, production design, engineering materials, thermodynamics and heat transfer, machine design, and related engineering topics allow the student to build upon these concepts. Practical applications of these concepts are further realized as the student completes an internship project during the fourth semester.

Upon entering the work place, the graduate can expect to assist engineers and scientists in the design and development of new products. As work experience is acquired, the graduate can expect to gain more design responsibility and thereby become a key member of an engineering team.

A Graduate of this Program Will be Able to:

- Produce detail, subassembly, and full-assembly engineering drawings utilizing manual and computer-aided drafting techniques.
- Recognize and apply the ASME Y14.5 guidelines in the creation of engineering drawings.
- Utilize ASME Y14.5 geometric dimensioning and tolerancing guidelines for establishing and maintaining the functional fit of mating parts.
- Apply industrial practices in the design and fabrication of sheet-metal components, welded assemblies, and piping systems.
- Identify and understand manufacturing processes and their effect on the cost and/or function of manufactured products.
- Analyze and design mechanical parts and systems for static and dynamic loading conditions.
- Apply engineering principles for determining the effects of stationary and moving fluids and the control and transformation of energy.
- Design manufacturing tooling for locating, clamping, forming, piercing, blanking, and/or shaping a given part.
- Employ structured programming techniques and utilize computer software tools to design and analyze mechanical parts or systems.
- Select and apply engineering materials for use in the design and manufacture of mechanical components.
- Analyze and design machine elements such as gears, shafts, bearings, clutches, brakes, flywheels, and related assemblies.
- Apply engineering problem-solving skills to complete a project on time and within budget.



William R. Chambers, Jr., PE, Professor
MME, BME: University of Delaware
AAS: Thaddeus Stevens College of Technology
Licensed Professional Engineer

Amy Jo Mumma-Frank, Professor
BA: Elizabethtown College

Model Schedule For Mechanical Engineering Technology (Option #1)

Semester 1

MET 101: Drafting Fundamentals	3
^MET 106: Engineering Graphics	3
^MET 116: Computer-Aided Drafting	3
^MET 176: Manufacturing Processes	3
†^MATH 137: Intermediate Algebra (or higher)	3
^ENG 106: English Composition	3

Semester 2

*MET 111: Engineering Standards	3
*MET 161: Fabrication Principles	3
MET 166: Mechanical Design	3
*MET 171: Product Design	3
*^PHYS 113: Statics	3
*^MATH 141: Trigonometry (or higher)	3

Semester 3

*^MET 201: Engineering Mechanics	3
*^MET 206: Fluid Mechanics	3
*^MET 211: Production Design	3
*^MET 216: Parametric Solid Modeling	3
*^ENG 216: Technical Writing	3
*^PHYS 213: General Physics I	4

Semester 4

*MET 261: Engineering Materials	3
*MET 266: Thermodynamics	3
*MET 271: Machine Design	3
*MET 276: Engineering Seminar	3
Humanities Elective	3
General Studies Elective	3

TOTAL CREDITS 73

Model Schedule For Mechanical Engineering Technology (Option #2)

Semester 1

MET 101: Drafting Fundamentals	3
^MET 106: Engineering Graphics	3
^MET 116: Computer-Aided Drafting	3
^MET 176: Manufacturing Processes	3
†^MATH 207: Precalculus (or higher)	4
^ENG 106: English Composition	3

Semester 2

*MET 111: Engineering Standards	3
*MET 161: Fabrication Principles	3
MET 166: Mechanical Design	3
*MET 171: Product Design	3
*^PHYS 113: Statics	3
General Studies Elective	3

Semester 3

*^MET 201: Engineering Mechanics	3
*^MET 206: Fluid Mechanics	3
*^MET 211: Production Design	3
*^MET 216: Parametric Solid Modeling	3
*^ENG 216: Technical Writing	3
*^PHYS 213: General Physics I	4

Semester 4

*MET 261: Engineering Materials	3
*MET 266: Thermodynamics	3
*MET 271: Machine Design	3
*MET 276: Engineering Seminar	3
Humanities Elective	3
General Studies Elective	3

TOTAL CREDITS 74

* Prerequisite or Co-requisite Required. See Course Description.

† Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 137 and MATH 141, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

^ Minimum Grade Required. See Course Description.

Mechanical Engineering Technology (MET)

MET 101 (3 credits) **Drafting Fundamentals**

An introductory course in the basics of instrument drawing, lettering, geometric construction, and associated manual drafting techniques.

MET 106 (3 credits) **Engineering Graphics**

A study of orthographic projection and the creation of engineering drawings with applications in sectioning and auxiliary views. This course also includes isometric drawing and practice in freehand sketching.

Minimum grade of "C" required

MET 111 (3 credits) **Engineering Standards**

A study of the American Society of Mechanical Engineers (ASME) dimensioning guidelines including geometric dimensioning and tolerancing (GD&T) for the design and manufacture of interchangeable mechanical parts.

Prerequisites: MET 106 and MET 116 (Both with final grade of C or higher or instructor permission)

MET 116 (3 credits) **Computer-Aided Drafting (CAD)**

An introduction to computer-aided drafting and its applications. The student will learn the fundamentals of using the computer operating system and the CAD program. These skills are affirmed with the completion of a series of mechanical drawings.

Minimum grade of "C" required

MET 161 (3 credits) **Fabrication Principles**

A study of the industrial practices in the design and fabrication of sheet-metal components, welded assemblies, and piping systems.

Prerequisite: MET 116 (With final grade of C or higher or instructor permission)

MET 166 (3 credits) **Mechanical Design**

A study of power transmission fundamentals and design-related computations. Design applications include sizing and/or selection of belts, chains, gears, bearings, couplings, shafts, cams, linkages, and electric motors.

MET 171 (3 credits) **Product Design**

The practical implementation of the mechanical design practices, engineering standards, and computer-aided drafting techniques as they relate to the design and fabrication of a manufactured product.

Prerequisites: MET 106 and MET 116 (Both with final grade of C or higher or instructor permission)

MET 176 (3 credits) **Manufacturing Processes**

A comprehensive study of the processing of materials as it relates to manufacturing. In this course, class lectures and literature review will be combined with machine shop practice and plant visits to form a well-rounded understanding of the intricacies of manufacturing technology

Minimum grade of "C" required.

MET 201 (3 credits) **Engineering Mechanics**

An introduction to the analysis of the static and dynamic forces which govern the behavior of structures and machines. The analytic skills in vector mechanics established in this course are employed for the design of structural components and assemblies as well as machine elements such as cams, gears, and linkages.

Prerequisites: MATH 137, MATH 141 and PHYS 113 (All with final grade of C or higher or instructor permission)

Co-requisite: PHYS 213

MET 206 (3 credits) **Fluid Mechanics**

A study of the effects of stationary and moving fluids as it relates to the analysis and design of mechanical systems. Topics involving the volume and energy transfer of a working fluid are utilized to demonstrate the problems commonly encountered in industry.

Prerequisites: MATH 137, MATH 141 and PHYS 113 (All with a final grade of C or higher or instructor permission)

Co-requisite: MET 201 and PHYS 213

MET 211 (3 credits) **Production Design**

An introductory course in manufacturing engineering and lean production methods. Major topics include manufacturing processes, economics of production design, and design of manufacturing systems.

Prerequisite: MET 176 (With a final grade of C or higher or instructor permission)

Corequisite: MET 216

MET 216 (3 credits) **Parametric Solid Modeling**

An intermediate computer-aided drafting course in three-dimensional, feature-based, parametric solid modeling with applications in the designing and detailing of mechanical components and assemblies. Applications include structured programming with practical applications in the creation and modification of solid models for complex parts, assemblies, and related engineering drawings.

Prerequisite: MET 116 (With final grade of C or higher or instructor permission)

MET 261 (3 credits)
Engineering Materials

An introduction to the selection and utilization of engineering materials as they relate to their mechanical characteristics under various operating conditions. Material strength and failure criteria are utilized to identify design margins of safety for mechanical components.

Prerequisites: MET 176, ENG 106, ENG 216, PHYS 113, and PHYS 213 (All with final grade of C or higher or instructor permission)

MET 266 (3 credits)
Thermodynamics

An introduction to the principles which govern the control and transformation of energy. These principles provide a concise description of the processes that are common to boiler, refrigeration, and related systems.

Prerequisites: MET 206 and PHYS 213 (Both with final grade of C or higher or instructor permission)

MET 271 (3 credits)
Machine Design

A study of the design of machine elements such as gears, shafts, bearings, clutches, brakes, flywheels, and related assemblies. These concepts will be employed by the student through structural analysis of numerous machine elements.

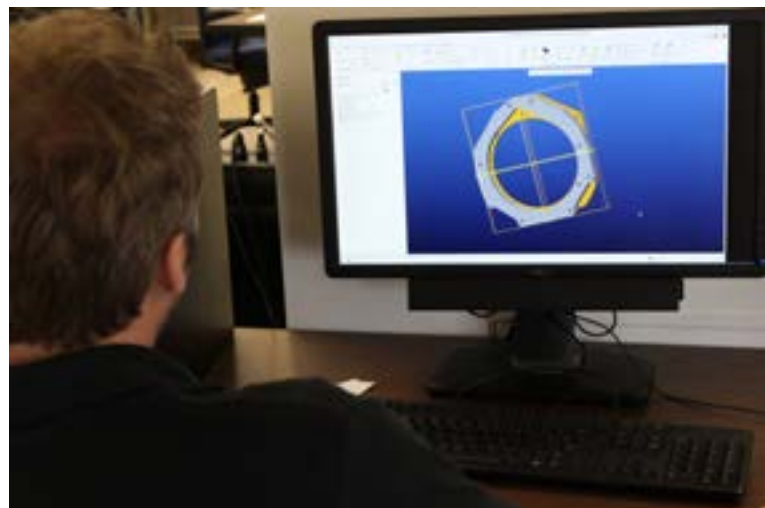
Prerequisites: MET 201, MET 216, and PHYS 213 (All with final grade of C or higher or instructor permission)

MET 276 (3 credits)
Engineering Seminar

A review course for the fundamentals of manufacturing including engineering economics and special topics of engineering technology. This course also covers engineering internship projects, technical presentations, and preparation for SME certification examination.

Prerequisites: MET 211 and MET 216 (Both with final grade of C or higher or instructor permission)

Co-requisites: MET 261, MET 266, and MET 271



Metals Fabrication & Welding

What is Metals Fabrication and Welding Technology?

Metals Fabrication and Welding Technology provides the student with a working knowledge of the various tools, equipment, and modern techniques used in the metals fabrication, mechanical installation, and welding industries. The proper application of various layout, fabrication, and assembly techniques for specific designs in sheet metal, plate, structural metals and pipe will be stressed. Students will design, estimate, fabricate, and install projects relative to air handling systems and structural and miscellaneous fabricated systems. Proper and safe work habits must be developed due to the nature of the equipment necessary to be successful in the industry.

The understanding and mastery of layout techniques is an essential component for success in the metals fabrication and welding fields. Therefore, disciplines in the basic, parallel line, radial line, and triangulation methods of layout are covered. Also, instruction in blueprint reading relative to the manufacturing and construction industries will be required. Included are components in drafting, orthographic projection, and symbol interpretation. Gas metal arc, shielded metal arc, gas tungsten arc, oxy-acetylene, and flux core arc welding will be studied and practiced to allow students to obtain skills for a total understanding of fabricated projects from design through the final assembly processes.

Graduates of the Metals Fabrication and Welding Technology program are prepared to work in businesses and industries that design, build, and install products that have been fabricated from sheet, plate, and structural metals. Areas of employment include the following:

- HVAC sheet metal duct systems fabrication & installation
- Precision sheet metal layout and fabrication
- Welding
- Industrial maintenance/millwright
- Plate layout/fitter for industrial fabrication
- Mechanical systems estimator/project manager
- Fabrication machinery operator
- Equipment manufacturing and installation
- Structural steel and miscellaneous iron fabrication
- Automated cutting systems operation programming
- Sales - industrial equipment or contractor
- Shop/installation foreperson
- Fabrication of sanitary stainless-steel products
- Food and pharmaceutical processing applications
- Industrial ventilation fabrication and installation

A Graduate of this Program Will be Able to:

- Demonstrate the ability to perform technical work related to welding, structural steel fabrication, sheet metal, and plate fabrication, applying OSHA and other applicable safety standards to work safely.
- Apply concepts of geometry, trigonometry, and physics to develop, to lay out, to fit, and to weld various fittings, structures, and systems associated with industrial and commercial metals fabrication.
- Identify and demonstrate correct use of various hand and power tools used in the fabrication industry.
- Demonstrate the ability to develop and interpret blueprints using accepted practices of orthographic projection.
- Determine set-up effectiveness of shop equipment and develop methods of manufacturing various products.
- Keep accurate records of project work, time expended, materials used, and costs incurred associated with a given job.
- Demonstrate a comprehension of business practices related to the metals fabrication industry.
- Estimate the costs associated with design, fabrication, and installation of various structural, sheet metal, or maintenance projects.
- Demonstrate basic oral communication skills, speak logically, and use various types of oral and written communication techniques to promote good business relationships, to develop leadership, and to establish good employer, customer, and employee relationships.
- Demonstrate competency in the simple, parallel line, radial line, and triangulation methods of layout to develop elbows, transitions, and tees in both round and rectangular forms.
- Understand industry standards of quality.
- Demonstrate the ability to choose the proper materials and fabrication and welding procedures for given projects.
- Be prepared to accept the challenges and responsibilities of the metals fabrication industry, knowing the full range of employment and advancement possibilities.

Stacy Gillis, Instructor

AAS: Thaddeus Stevens College of Technology

Stephen E. Hower, Assistant Professor

AAS: Thaddeus Stevens College of Technology

Completion of Occupational Competency Exam: The
Pennsylvania State University

Completion of Welding Instructor Course:

Hobart Institute of Welding Technology

Certificate of Completion: Industrial Ventilation Conference,
Michigan State University

Occupational Safety and Health Administration (OSHA):
Construction Safety and Health Certificate

Jim Stewart, Instructor

BS: Franklin University

AAS: Harrisburg Area Community College

Christopher Unruh, Instructor

AAS: Thaddeus Stevens College of Technology

Model Schedule For

Metals Fabrication & Welding Technology

Semester 1

MFWT 106: Gas Metal Arc Welding/Plasma

Arc Cutting 3

MFWT 111: Metals Fab I: Intro to Hand &

Machine Processes 3

***MFWT 121: HVAC Duct Design and Fabrication** 3

MFWT 126: Drafting Fundamentals 3

†MATH 137: Intermediate Algebra (or higher) 3

***CIS 105: Drawing with Auto Cad**
(must take before MFWT 222) 3

Semester 2

***MFWT 153: Oxy-Acetylene Welding and**
Cutting /Flux Cored Arc Welding 3

***MFWT 161: Metals Fabrication II: Parallel**
Line Development Machine Processes 3

***MFWT 167: Industrial Applications I:**
Fabrication Blue Print Reading 2

MFWT 171: Materials of the Trade and
Applied Metallurgy 2

***MATH 132: Elementary Geometry (or higher)**
***See Physics Elective for Math Requirement** 3

CIS 111: Intro to Computer Applications 3

Semester 3

***MFWT 207: Shielded Metal Arc Welding** 4

***MFWT 212: Metals Fabrication III:**
Triangulation Pattern Machine Processes 4

***MFWT 222: Industrial Applications II:**
CNC Applications and Estimating 4

***Physics Elective: PHYS 101, PHYS 106,**
PHYS 113, or PHYS 213 (must take MATH 141
for PHYS 113 or PHYS 213) 3

ENG 106: English Composition 3

Semester 4

***MFWT 257: Gas Tungsten Arc Welding** 4

***MFWT 262: Metals Fabrication IV: Radial Design**
Development & Machine Processes 4

***MFWT 267: Industrial Applications III:**
Print Reading for Welding 4

***ENG 216: Technical Writing** 3
Humanities Elective 3

Additional General Education Requirements

HEAL 106 or HEAL 111 1

TOTAL CREDITS 71

** Prerequisite or Co-requisite Required. See Course Description.*

*†Any Student who has taken pre-calculus (MATH 207) or
calculus (MATH 213) instead of MATH 137 and MATH 132, must
take an additional Gen-Ed elective in order to meet their Gen-Ed
requirements.*



Metals Fabrication & Welding Technology (MFWT)

MFWT 106 (3 credits)

Gas Metal Arc Welding/Plasma Arc Cutting

Provides a thorough technical understanding of welding safety, gas metal arc welding fundamentals, gas metal arc equipment adjustments, metal transfer, and shielding gases. Provides training to develop the manual skill necessary to make high quality gas metal arc welds in all positions on mild steel from 1/16" to 3/8" thickness with single and multiple passes, using short circuit transfer.

MFWT 111 (3 credits)

Metals Fabrication I: Introduction to Hand and Machine Processes

Introduction to tools, materials, and equipment required to fabricate basic sheet metal projects. Students develop an understanding of seaming, hemming, and fastening techniques. Safety standards according to Occupational Safety and Health Administration (OSHA) are covered.

MFWT 121 (3 credits)

HVAC Duct Design and Fabrication

Teaches how to properly design and fabricate duct systems relative to low-pressure HVAC systems. Machinery, seaming, connecting, and basic layout techniques are covered. Course includes the interpretation of applicable Sheet Metal and Air Conditioning Contractors National Association (SMACNA) codes for duct construction.

Prerequisite: MFWT 111

MFWT 126 (3 credits)

Drafting Fundamentals

Introduction to drafting and sketching techniques. Major topics include geometric construction, drafting equipment, and orthographic projections. Mechanical drawing required.

MFWT 153 (2 credits)

Oxy-Acetylene Welding and Cutting/Flux Cored Arc Welding

Offers a technical understanding of Flux cored arc welding and oxy-acetylene welding, flame cutting, brazing fundamentals, and welding safety. Training for manual skill necessary to produce high quality welds on mild steel in all positions. Manual and mechanized flame cutting and brazing mild steel also included.

Prerequisite: MFWT 111

MFWT 161 (3 credits)

Metals Fabrication II: Parallel Line Development and Machine Processes

Instruction in the use of precision measuring tools and saws. Use of parallel line method of pattern development for fabrication of elbows, tees, and offsets using sheet metal, pipe, and plate materials are covered.

Prerequisite: MFWT 111

MFWT 167 (2 credits)

Industrial Applications I: Fabrication Blueprint Reading

Discusses the equipment used in the various fabrication and welding trades, such as sheet and plate products plus structures, tubing, pipe, and the various alloys of steel, aluminum and stainless steel. Included is the application of metals for industrial, commercial, and manufacturing design.

Prerequisite: MFWT 111

MFWT 171 (2 credits)

Materials of the Trade and Applied Metallurgy

Covers the common materials, designations, and methods of measurement used in the various fabrication and welding trades. Sheet and plate products plus structures, tubing, pipe, and the various alloys of steel, aluminum, and stainless steel are discussed.

MFWT 207 (4 credits)

Shielded Metal Arc Welding

Provides students with a thorough technical understanding of shielded metal arc welding fundamentals, welding safety, welding machines, and electrode classifications and selections. It also provides training to develop the manual skill necessary to produce high quality shielded metal arc welds in all positions on mild steel from 16 gage to 1" plate with single and multiple passes. The welding process using mild steel electrodes with low hydrogen and iron powder flux coatings while using AC and DC power sources is covered.

Prerequisite: MFWT 106

MFWT 212 (4 credits)

Metals Fabrication III: Triangulation Pattern

Developmental and advanced machine processes designed to introduce students to the triangulation method of pattern development. Using this discipline of pattern development, students design, lay out, and fabricate transitions, Y-branches and other irregular fittings related to sheet metal, piping, and miscellaneous plate fabrication according to job specifications. Students also learn advanced machinery set-up techniques relative to the fabrication of components designed using this layout process. Instruction in the use of precision measuring tools, iron workers, press brakes, and saws are also major topics covered.

Prerequisites: MFWT 111 and MFWT 161

MFWT 222 (4 credits)**Industrial Applications II: CNC Applications and Estimating**

The major objective of this course is to introduce students to aspects of programming and utilizing computer-controlled plasma and oxy-fuel cutting systems. Students use AutoCAD® and MTC ProNest software packages to produce duct, weldment, and miscellaneous profile parts from blueprints, sketches, and field measurements. Programmed parts are then nested and cut on given sheet or plate sizes using state-of-the-art computer numerical control (CNC) systems or plasma cutting system. Layout techniques previously learned for profile programming jobs are utilized. Other topics covered in this course are project management and estimating.

Prerequisites: MFWT 161 and CIS 105

MFWT 257 (4 credits)**Gas Tungsten Arc Welding**

Provides students with a thorough understanding of gas tungsten arc welding fundamentals, arc characteristics, and welding safety. It provides training to develop the manual skill necessary to make high quality gas tungsten arc welds in all positions on 16- and 11-gage mild steel, 16- and 11-gage aluminum, also 16-gage stainless steel using both alternating and direct current. In addition, material is presented on the weld characteristics of carbon steel, stainless steel, and aluminum. The use of abrasives and other clean-up techniques to produce quality USDA and FDA finishes is covered. Instruction on the use of purging is also given.

Prerequisite: MFWT 106

MFWT 262 (4 credits)**Metals Fabrication IV: Radial Design Development and Machine Processes**

This course is designed to instruct students in the use of the radial line method of pattern development. Students lay out and fabricate various sheet metal and plate fittings such as cones, reducers, and take-off branches using this technique. Fittings are then welded using processes previously learned.

Prerequisite: MFWT 111

MFWT 267 (4 credits)**Industrial Applications III: Print Reading for Welding/ Field Equipment and Rigging**

Selected on- and off-campus projects are utilized to reinforce previous instruction. Opportunity to study and to evaluate projects to learn various aspects of industry. Applicable codes and standards are used to ensure proper design and applications of materials and processes are covered. Also included are the interpretation of welding blueprints and applications in field equipment and rigging.

Prerequisite: MFWT 167



Metalcasting Technology and Manufacturing Management

What is Metalcasting Technology and Manufacturing Management?

The Metalcasting Technology & Manufacturing Management program is a high energy, hands-on application of science (chemistry, physics) combined with basic principles in management. The Metalcasting Technology component is not naturally intuitive, so knowledge in this field is both powerful and valuable. Courses in the technical program provide students with a foundation of understanding for metalcasting applications, the process of creating a metal casting from a blueprint, meeting customer specifications and quality control standards.

The Manufacturing Management component introduces students to concepts for management success. It bolsters the science and technology component of metalcasting with the human elements of working with people, organizational culture and change, problem solving, and leadership. Students will gain confidence in themselves and learn to work in and manage teams.

Graduates of this program are valuable employees in any component of the manufacturing value-chain: suppliers, manufacturers or customers.

A Graduate of this Program Will be Able to:

- Demonstrate an understanding of metalcastings and their application in the manufacturing value-chain.
- Produce a metalcasting and all sub-components of the metalcasting process including: tooling, cores, molds, metal and molding sand.
- Demonstrate the basics of casting defect analysis, including the proper identification of the type, root-cause and remediation methods.
- Complete the OSHA 10-Hour General Industrial Safety Course.
- Demonstrate an understanding of their personal role in safety and the management structures used to maintain a safe work environment.
- Verify that quality standards related to mechanical properties and chemistry are satisfied.
- Utilize software for word processing, spreadsheet creation, database management and group presentations.
- Work productively in teams and lead a team to achieve a business objective.
- Utilize speaking skills and communication methods to make group presentations.

Matt Sullivan, Instructor
 MBA: The Pennsylvania State University
 BS: The Pennsylvania State University
 Six Sigma Black Belt Certification: Maryland World
 Class Mfg Consortium



Model Schedule For Metalcasting Technology and Manufacturing Management

Semester 1

CIM 106: Blueprint Reading	3
CAST 106: The World of Metalcasting	3
CAST 110: Patterns and Designs	3
CAST 120: Moldmaking I	3
CHEM Elective: CHEM 100 (or higher)	3
CIS 111: Intro to Computer Applications	3

Semester 2

BUAD 160: Principles of Management	3
CAST 150: Casting Ferrous and Nonferrous Metals	3
IET 155: Industrial Health and Safety	3
CAST 170: Moldmaking II	3
†MATH 126: Technical Math I (or higher)	3
ENG 106: English Composition	3

Semester 3

*CAST 210: Advanced Metalcasting-Related Processes	3
*CAST 220: Inspection and Quality Assurance	3
CAST 270: Industrial Supervision	3
CAST 205: Fundamentals of Machining	3
MATH 150: Elements of Statistics	3
ENG 221: Public Speaking	3

Semester 4

CAST 250: The Business of Manufacturing	3
*CAST 265: Automated Systems in Metalcasting	3
*CAST 290: Manufacturing Capstone Project	4
CIM 161: Metallurgy	2
Humanities : Elective	3
General Studies Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
TECH 100 Internship Recommended Over Summer Between First and Second Year	

TOTAL CREDITS **73**

* Prerequisite or Co-requisite Required. See Course Description.

†Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 126 and MATH 150, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

CIM 106 (3 credits)**Blueprint Reading and Related Math**

Interpretation of industrial drawings, basic skills in sketching, and applied mathematics.

CAST 106 (3 credits)**The World of Metalcasting**

The World of Metalcasting introduces students to the process of metalcasting and provides an overview of this key industry. This includes the history and role of metalcasting, material competitors, the identification and role of professional organizations within the industry, and the interfacing of the industry with value-added operations. A significant amount of coursework is allocated to exploring the applications for castings, by "learning to see them" in the world around us.

CAST 110 (3 credits)**Patterns and Design**

Patterns and Design provides the basic skills and knowledge associated with the various types of patterns found throughout the metalcasting industry. Students will study how patterns are designed and built, and also be able to demonstrate the science behind the design. Students will produce a pattern using current technologies.

CAST 120 (3 credits)**Moldmaking I**

Moldmaking I introduces the basics of molds preparation for metal casting. Students will learn the molding process, the components of a molding operation, the quality requirements of the green sand process, and how molds are used in the Metal Casting Industry.

CAST 150 (3 credits)**Casting Ferrous and Nonferrous Metals**

Casting Ferrous and Nonferrous Metals provides knowledge and skills in the industrial processes of melting and pouring metals. Students obtain hands-on experience in the safety requirements related to liquid metals, the melting and pouring of molten metals, the application of quality controls and the resulting mechanical properties and microstructures of cast metals.

CAST 170 (3 credits)**Moldmaking II**

Moldmaking II introduces alternative molding processes, the core-making process, and the world of casting defects. These include skills in No-bake, Investment and Die-cast Molding processes, along with Hot-box and Cold-box core processes. In addition, students will learn the basics of casting defects, including type, source and remediation methods.

Prerequisite CAST 120

IET 155 (3 credits)**Industrial Health and Safety**

Industrial Health and Safety is designed to provide an understanding of safe working conditions and practices in an industrial environment. Students will learn about the potential hazards and safety measures found in a metalcasting operation. Additionally, and perhaps most valuably, the students will "learn to see" unsafe conditions and acts to facilitate safety.

BUAD 160 (3 credits)**Principles of Management**

This course is designed to prepare BUAD students for management success by studying the primary theories, principles and processes of management. Students will gain valuable insight in issues such as leadership, planning and control, problem solving and creativity, organizational culture and change, ethics and social responsibility, and working in and managing groups.

CAST 210 (3 credits)**Advanced Metalcasting-Related Processes**

Advanced Metalcasting-Related Processes offers students a deeper-dive into casting design and defect analysis, building upon concepts learned in previous courses. Additionally, it develops the business side of the equation by introducing the concepts of unit-cost estimating, the purchasing relationship and value-added operations.

Prerequisite CAST 110 and CAST 170

CAST 220 (3 credits)**Inspection and Quality Assurance**

Inspection and Quality Assurance provides students with a foundation of the quality systems used in manufacturing. Both industry and customer specifications provide the targets, but the process outputs rely on process controls, problem solving and the ability to collect measurements in order to establish process capability. Students will learn to differentiate between a "desired outcome" and the process' actual ability to deliver results.

Co-requisite: MATH 150

CAST 270 (3 credits)**Industrial Supervision**

Industrial Supervision introduces the tools of human interaction to students. These soft-skills are critical to the success of anyone in a leadership role. The student will realize that products and processes, although complex, can be relatively simple when compared to the complexities of people. Coursework is highly interactive and will require practicing leadership techniques.

CAST 205 (3 credits)
Fundamentals of Machining

This course will introduce students to common machine tools and processes. Students will be exposed to down-stream, value-added operations and use equipment (i.e.: a Vertical Mill, Engine Lathe, and Drill Press) to learn how these functions are impacted by metalcasting process variables.

CAST 250 (3 credits)
The Business of Manufacturing

The Business of Manufacturing curriculum provides students with tools to solve problems, manage projects and improve processes. The value of time and the benefits of stakeholder "buy-in" are established. The concept of continuous improvement is presented as a valuable component for long-term stakeholder satisfaction.

CAST 265 (3 credits)
Automated Systems in Metalcasting

Automated Systems in Metalcasting provides a bridge between the original manual methods learned and the current automated systems used in the metalcasting industry. These automated systems relieve the human from the physical burdens of the process, and instead, allow the focus to be on process direction and controls. Applications of automation improvements will be presented in molding, melting, coring, pouring, finishing and sand preparation.

Prerequisite CAST 120 and CAST 170

CAST 290 (4 credits)
Manufacturing Capstone Project

The Manufacturing Capstone Project provides students with a real-world opportunity to apply and practice all of the skills learned in the Metalcasting Technology & Manufacturing Management Program. Students will rely on learned manufacturing technology and soft-skills applications to achieve a valuable solution for an industry partner.

Prerequisite CAST 220, CAST 270 and IET 155

CIM 161 (2 credits)
Metallurgy

Covering the basic principles of metallurgy, this course clarifies many industrial processes. Students gain an understanding of quenching, annealing, case hardening, tempering, and crystallization.



Plumbing Technology

What is Plumbing Technology?

Students in the Plumbing Technology program learn how to design, install, and repair residential and commercial plumbing systems and hydronic heating systems. Some of the skills acquired are joining different types of piping materials, reading blueprints, and installing and repairing boilers, plumbing fixtures, faucets, and water heaters.

Employment opportunities in the plumbing and pipe-fitting industries include the installation of plumbing and heating systems in new buildings and the installation and maintenance of plumbing, heating, and piping systems for industries, public utilities, or government agencies. Self-employment is another option. Many graduates become self-employed plumbers after completing their apprenticeships.

A Graduate of this Program Will be Able to:

- Apply safety principles and demonstrate good work habits in the trade.
- Use the hand and power tools of the trade.
- Identify piping materials and install them using proper connections.
- Use and apply trade terms and technical data.
- Read and interpret blueprints, specifications, and codes as they apply to the trade.
- Lay out, estimate, calculate, and use mathematical skills as required in the trade.
- Install, maintain, and repair plumbing, heating, and mechanical systems and equipment.
- Keep abreast of new developments in the field.
- Demonstrate the ability to write letters of application, memos, work orders, reports, and apply communication skills in the world of work.

Kemon Papadimitriou, Instructor
AAS: Thaddeus Stevens College of Technology

Vincent J. Skimski, Instructor
Master Plumber
Member of the City of Reading, PA Plumbing Board
American Society for Sanitary Engineering (ASSE): certified
back flow tester
Torch brazing procedure for
medical gas installation certificate
Gastite, TracPipe, and Perfection Permasert piping
applications certificates
ICC Plumbing Inspector
PA State competency certified
Spears ASME certified PVC solvent weld pipe
Uponor PEX certified



Model Schedule For Plumbing Technology

Semester 1

PLBG 106: The Plumbing Trade	1
PLBG 111: Plumbing Design I: Introduction to Plumbing Systems	2
PLBG 115: Plumbing Installation I (a) Plumbing Materials	4
PLBG 120: Plumbing Installation I (b) Plumbing Tools	3
PLBG 121: Construction Blueprint Reading	2
[†] MATH 126: Technical Math I (or higher)	3
ENG 106: English Composition	3
HEAL 111: Basic First Aid	1

Semester 2

*PLBG 156: Plumbing Design II: Blueprint Reading	3
*PLBG 170: Plumbing Installation II (a) Underground/Aboveground Rough In	3
*PLBG 175: Plumbing Installation II (b) Fixture Installation	2
*PLBG 166: Plumbing Service I: Introduction to Plumbing Service	2
*MATH Elective: MATH 136 Technical Math II (or higher) OR *MATH 132: Elementary Geometry (or higher)	3
CIS 111: Intro to Computer Applications	3

Semester 3

*PLBG 206: Plumbing Design III: Plumbing Codes	2
*PLBG 211: Plumbing Installation III	4
*PLBG 216: Plumbing Installation IV: Commercial Plumbing Installation	3
*PLBG 221: Plumbing Service II: Advanced Plumbing Services	1
Science Elective	3
BUSN 106: Small Business Management	3

Semester 4

*PLBG 256: Plumbing Design IV: Designing Hydronic Heating Systems	3
*PLBG 261: Plumbing Installation V: Installing Hydronic Heating Systems	4
*PLBG 266: Plumbing Service III: Servicing Hydronic Heating Systems	2
*PLBG 271: Plumbing Installation VI	2
General Studies Elective	3
Humanities Elective	3

TOTAL CREDITS 68

** Prerequisite or Co-requisite Required. See Course Description.*

[†] Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 126 and MATH 136 (or MATH 132), must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

[^] Minimum Grade Required. See Course Description.

Plumbing Technology (PLBG)

PLBG 106 (1 credit) **The Plumbing Trade**

Prepares students for their role in the Plumbing Technology program at Thaddeus Stevens College and for their future in the field. Examines organizational skills, safe work habits, and proper work attitude. Surveys the history of plumbing while also offering an examination of job opportunities and an analysis of steps in career progressions.

PLBG 111 (2 credits) **Plumbing Design I: Introduction to Plumbing Systems**

Study of potable water, methods of sewage disposal, components of plumbing systems, and basic physics as related to plumbing.

PLBG 115 (4 credits) **Plumbing Installation I(a): Plumbing Materials**

Familiarizes students with the proper selection and use of all the materials (cast iron, steel, copper, plastics, and others) of the plumbing and pipefitting trades.

PLBG 120 (3 credits) **Plumbing Installation I(b): Plumbing Tools**

Familiarizes students with the proper selection and use of all the basic tools (hand tools, power tools, and torches) of the plumbing and pipefitting trades, including measurement and other applied math.

PLBG 121 (2 credits) **Construction Blueprint Reading**

Introduces students to construction prints and documents. Basic drawing symbols and line forms are explained, and the course covers the use of basic drawing tools, dimensioning, and single line pipe drawing methods and practices.

PLBG 156 (3 credits) **Plumbing Design II: Blueprint Reading**

Focus on residential piping system design. Skills covered include the following: designing systems; reading blueprints; making orthographic and isometric pipe sketches and drawings; sizing potable water systems; sizing DWV systems; and sizing natural gas systems.
Prerequisite: PLBG 121

PLBG 166 (2 CREDITS) **Plumbing Service I: Introduction To Plumbing Service**

Focuses on the selection and use of tools and procedures for servicing and repairing plumbing systems. Skills include troubleshooting and repairing faucets and valve, leaking pipes, clogged drains, and toilets.
Prerequisite: PLBG 170 and PLBG 175

PLBG 170 (3 credits) **Plumbing Installation II(a): Underground And Aboveground Rough-In**

Introduces the student to the installation of residential potable and DWV (drainage, waste, and vent) piping systems and the support of those systems.
Prerequisites: PLBG 111, PLBG 115, and PLBG 120

PLBG 175 (2 credits) **Plumbing Installation II(b): Fixture Installation**

Introduces the student to bathroom and kitchen fixtures and water heaters. Discusses the installation of residential piping systems, bathroom/kitchen fixtures, and water heaters.
Prerequisites: PLBG 111, PLBG 115, and PLBG 120

PLBG 206 (2 credits) **Plumbing Design III: Plumbing Codes**

By examining the 2019 International Plumbing Code, this course prepares students to design, install, and maintain plumbing systems in compliance with this statewide code. The course features the proper use of materials and fittings, correct venting, methods for testing plumbing systems, and the sizing of potable water, drainage waste and vent, storm water drainage, and natural gas piping systems.
Prerequisites: PLBG 156, PLBG 170, and PLBG 175

PLBG 211 (4 credits) **Plumbing Installation III**

An advanced residential plumbing course that is basically concerned with the plumbing of the housing project. Shop practice is made available as needed, but most instruction occurs at the housing project.
Prerequisite: PLBG 206

PLBG 216 (3 credits) **Plumbing Installation IV: Commercial Plumbing Installation**

Covers the design and installation of compressed air piping systems, storm water drainage systems, specification fittings and fixtures, and commercial sanitary drainage and venting, and potable water systems. Students learn to read commercial blueprints and to acquire information from specification literature, applying this information in developing the capstone project, a complete and functioning commercial toilet room facility.
Prerequisite: PLBG 115 and 120

PLBG 221 (1 credit) **Plumbing Service II: Advanced Plumbing Services**

An extension of PLBG 166. Covers the tools and procedures to repair flushometer valves, water heaters, frozen pipes, water hammer, and backflow.
Prerequisite: PLBG 166

PLBG 256 (3 credits)**Plumbing Design IV: Designing Hydronic Heating Systems**

Designing and sizing hydronic heating systems is taught. Includes the calculation of heat loss.

Prerequisite: PLBG 156

PLBG 261 (4 credits)**Plumbing Installation V: Installing Hydronic Heating Systems**

Students learn the proper installation of residential and commercial hot water heating systems.

Prerequisite: PLBG 115 and 120

PLBG 266 (2 credits)**Plumbing Service III: Servicing Hydronic Heating Systems**

Heating service, including repair of hot water circulation problems, combustion testing, oil burner, and gas burner repair, boiler clean-up, and system troubleshooting are covered.

Prerequisite: PLBG 115 and 120

PLBG 271 (2 credits)**Plumbing Installation VI**

Includes hands-on experience and training in the installation of plumbing fixtures, appliances, and the finished piping in a permanent structure. Work is done on the housing project and other appropriate projects around the campus.

Prerequisite: PLBG 211



Residential Remodeling Technology

What is Residential Remodeling Technology?

Residential Remodeling has become an essential part of the construction industry. Remodelers add living space to existing homes and retrofit homes to modern conveniences and updated building codes. Remodeling can be done not only for cosmetic purposes but also for structural reasons, as well as to increase the energy efficiency of older homes.

Jobs available in the residential remodeling field include but are not limited to carpenters; painters; drywall and ceiling tile installers; roofers; woodworkers; kitchen and bath remodelers; siding, roofing, and aluminum installers; and flooring specialists.

Upon graduation, students of the Residential Remodeling Technology program will have a number of different opportunities available. In addition to working in their field, graduates will also have the chance to continue their education in areas such as project management, technical education, residential designer, civil engineering, and structural engineering degrees. Advanced opportunities as crew leaders, supervisors, assistant supervisors, superintendents and small business owners may also be possible for graduates of the program.

A Graduate of this Program Will be Able to:

- Understand the history of residential buildings in the 20th and 21st centuries.
- Demonstrate basic carpentry woodworking skills.
- Demonstrate successful use of basic and advanced tools of the profession.
- Read blueprints to lay out projects necessary to complete tasks.
- Calculate material quantities and estimate time allowances for projects using mathematical skills required in the profession.
- Apply remodeling skills necessary for interior, exterior, kitchen, and bathroom projects.
- Operate masonry tools and equipment safely and effectively.
- Complete basic masonry repairs.
- Identify and rectify basic plumbing problems in an existing dwelling.
- Troubleshoot basic electrical circuits found in a dwelling.
- Practice safety in the lab and on-site environments.
- Demonstrate a strong work ethic and the ability to work both independently and as a contributing member of a team.
- Stay current with any new technology or codes related to remodeling.

Loren Bishop, Instructor
 BS: Eastern University
 OSHA Certified Outreach Instructor

Charles T. Byers, Associate Professor
 AAS: Thaddeus Stevens College of Technology
 FHA/VA Certificate Builder
 NCCER Certified Instructor Carpentry Level 4
 OSHA Certified Outreach Instructor



Model Schedule For Residential Remodeling Technology

Semester 1

RMDL 106: Hand Tools and Power Tools	3
RMDL 111: Building Materials	3
CARP 157: Floor, Wall, and Ceiling Framing	3
CARP 182: Blueprinting Reading	3
†MATH 126: Technical Math I (or higher)	3
ENG 106: English Composition	3

Semester 2

CARP 116: Building Site and Foundations	3
CARP 161: Stair Construction and Remodeling	2
CARP 166: Roofing and Exterior Finishes	3
^CARP 177: Exterior and Interior Finishes	3
*CIS 111: Intro to Computer Application (must take before RMDL 215)	3
*MATH 132: Elementary Geometry (or higher)	3

Semester 3

*RMDL 205: Remodeling Drafting & Design	2
*RMDL 210: Demolition & Stabilization	2
*RMDL 215: Estimating & Scheduling	2
RMDL 220: Remodeling Electro-Mechanical Systems	3
*RMDL 250: Insulation and Weatherization	2
Science Elective	3
BUSN 106: Small Business Management	3

Semester 4

CARP 272: Site Work and Foundations II	2
*RMDL 260: Kitchen & Bath Remodeling	3
*RMDL 270: Advanced Interior Finishes	3
*RMDL 280: Advanced Exterior Finishes	3
*ENG 216: Technical Writing OR ENG 221: Public Speaking	3
Humanities Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
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TOTAL CREDITS **70**

* Prerequisite or Co-requisite Required. See Course Description.

†Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 126 and MATH 132, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

^ Minimum Grade Required. See Course Description.

Residential Remodeling Technology (RMDL)

RMDL 106 (3 credits)

Hand Tools and Power Tools

This course is a general introduction to the basic tools that are used by a carpenter with an emphasis on safety, proper usage and procedures, and various applications that are most commonly used in the carpentry trades.

RMDL 111 (3 credits)

Building Materials

This course covers the wide range of building materials used in carpentry, from the many different types of wood products used to the newest technology of steel framing. Proper procedures for estimating these building materials to the variety of fastening methods are also covered. Building anatomy from the 1940s and prior up to and including present is discussed.

CARP 116 (3 credits)

Building Site and Foundations

In this course, students learn how to set up and operate the transit level and laser level. Building layout and excavation of residential construction will be explained, with particular emphasis on building stake-off. Types of footers, foundations, and concrete forming are also explored. Students will be challenged to practice proper building site layout, constructing concrete stair and sidewalk forms, and installing the form-a-drain system.

CARP 182 (3 credits)

Blueprint Reading

In this course students will learn the proper techniques necessary to dissect a set of residential blueprints and develop a broad understanding of the language of construction drawings. We will also become involved in duplicating, through the process of mechanical architectural drafting, a few select detailed residential section drawings, with each having different drafting scales.

CARP 157 (3 credits)

Floor, Wall, and Ceiling Framing

With a strong emphasis on platform framing, students will examine and demonstrate the proper methods of constructing subfloors, walls, and ceilings in the framework of residential and light commercial construction. This includes discussing the basic components and construction methods of light-gauge steel framing.

CARP 161 (2 credits)

Stair Construction and Remodeling

Students learn the different types of stairways and all parts pertaining to them. They also learn how to calculate, lay out, and construct stairway stringers with their proper landings, risers, treads, and railings.

CARP 166 (3 credits)

Roofing and Exterior Finishes

The different types of roof systems and all the material members that are involved in the different roof types are discussed. Students learn theoretically how to calculate rafters to fit their proper situations and practice laying out and cutting common and hip rafters. In addition, students are introduced to various exterior finishing with a focus on vinyl siding.

CARP 177 (3 credits)

Exterior and Interior Finishes

In this course, students will study and practice installing various types of exterior and interior finish material for residential construction. For exterior finish, we will give special attention to the proper installation procedures for roofing; siding; soffit; windows and doors; and aluminum trim. For interior finish, strong emphasis is placed on proper techniques for hanging drywall; installing prehung doors and door trim; applying trim around a window unit; and other common trim materials.

Minimum grade of "C" required

RMDL 205 (2 credits)

Remodeling Drafting and Design

This course covers the principles of drafting and design for remodeling purposes. Particular emphasis will be placed on documenting the existing structure where it meets the new construction, including kitchens, baths, utilities, and all mechanicals. Students will create sketches and working drawings that follow design constraints and a systematic renovation sequence.

Prerequisite: CARP 182

RMDL 210 (2 credits)

Demolition and Stabilization

This course covers the principles of proper techniques used for demolition and stabilizing structures during the remodeling process. It covers the safe use of tools and equipment and salvaging existing materials for reuse.

Prerequisite: CARP 157

RMDL 215 (2 credits)

Estimating and Scheduling

This course covers the principles of fundamental estimating and scheduling skills. Microsoft Excel® is used to establish estimating and scheduling procedures associated with a remodeling project. Cross-disciplinary estimating and inspection processes that will be necessary during the project are both addressed.

Prerequisites: RMDL 111 and CIS 111

RMDL 220 (3 credits)**Remodeling Electro-Mechanical Systems**

This course provides a general introduction to electro-mechanical systems in a residential structure and how to modify these systems during the renovation process. Students learn how to safely and properly re-route basic electrical, plumbing, and HVAC ducts that are regularly encountered when remodeling a building. Emphasis is placed on when the scope of the work requires a sub-contractor to perform the work.

RMDL 250 (2 credits)**Installation and Weatherization**

This course covers the various types of products for reducing building heat loss by infiltration and conduction and the use of insulation used for noise and fire protection. Types of ventilation baffles, vapor barriers, infiltration barriers, and types of insulation are covered. Students perform installation of insulation materials for walls, ceilings, floors, and fire stop applications.

Prerequisites: CARP 177 and RMDL 220

RMDL 260 (3 credits)**Kitchen and Bath Remodeling**

This course covers the details and techniques used for residential remodeling and restoration of kitchens and baths. Students are exposed to a wide variety of products and the appropriate match for existing conditions. Emphasis is on the demolition of existing space and the acceptable design of the new space.

Prerequisite: RMDL 250

RMDL 270 (3 credits)**Advanced Interior Finishes**

This course covers the details and applications of various interior painting and finishing and materials integrated to match renovation work with the existing building. The proper wood types and species, finishing methods, and applications are utilized. Details of interior pre-hung doors, window stools, extension jambs, and casing are covered. Students perform the installation of a complete custom interior trim package.

Prerequisite: RMDL 177 with a minimum grade of "C" or instructor permission

CARP 272 (2 credits)**Site Work and Foundations II**

Covers the details associated with site preparation and foundation inspections for a new building. Specifics are for lot size, set back, right of way, and building location. Work includes using various instruments for batter board installations, excavation of foundation, locating footer elevation, and forming and pouring footers. Locating, forming, and pouring of sidewalks and exterior porches.

RMDL 280 (3 credits)**Advanced Exterior Finishes**

This course covers the principles and practices of exterior finishes including roofing, siding, and aluminum trim applications.

Prerequisite: CARP 166



Water & Environmental Technology

What is Water and Environmental Technology?

The Pennsylvania Department of Environmental Protection requires that operators of drinking water and wastewater treatment facilities are certified. Certification is obtained through a combination of exams and operating systems. The completion of an approved associate degree program significantly reduces the number of years of operating experience required for certification. Students in the Water and Environmental Technology program gain the knowledge, skills, and abilities necessary for successful completion of Department of Environmental Protection examinations.

Courses in the Water and Environmental Technology program are designed to meet the knowledge, skills, and ability requirements tested on the Pennsylvania Department of Environmental Protection certification exams. This will include courses covering topics such as water and wastewater treatment; water distribution and wastewater conveyance systems; geographical information systems (GIS); equipment maintenance; solids handling; basic electricity; plant administration; and rules and regulations.

A Graduate of this Program Will be Able to:

- Describe the major processes, equipment, instrumentation, laws, and regulations associated with the collection and treatment of wastewater.
- Describe the major processes, equipment, instrumentation, laws, and regulations associated with the conveyance and treatment of potable water.
- Perform water and wastewater calculations involving flow, volume, surface area, disinfection, solids removal, retention time, and chemical feed rates.
- Analyze and improve operational procedures at water treatment and wastewater treatment facilities.
- Prepare, analyze, interpret, and report results of water and wastewater sample testing.
- Maintain a safe working environment as outlined by federal and state regulations.
- Describe the Safe Water Drinking Act and its implementation.
- Identify and describe the common diseases associated with water supply and sewage.
- Demonstrate the monitoring duties of water treatment operators.
- Describe the areas of safety to be considered in water treatment, storage, and laboratory testing.
- Describe the operation, components, and troubleshooting procedures for motors and electrical circuits.
- Determine and employ optimization strategies for water treatment and wastewater treatment processes and treatment facilities.

Heath A. Edelman PE, Instructor
 B.S. Pennsylvania State University
 M.S. University of New Haven
 Licensed Professional Engineer
 PA Certified Wastewater Operator
 PA Certified Water Operator
 Certified Hazardous Material Manager

Kathleen E. Surra, Instructor
 MEng, BSc: Queens University
 PA Department of Environmental Protection certified
 drinking water operator
 Authorized OSHA general industry training provider



Model Schedule For Water & Environmental Technology

Semester 1

WET 111: Drinking Water Distribution	3
WET 116: Water Resources	4
WET 156: Drinking Water I	4
†MATH 137: Intermediate Algebra (or higher)	3
ENG 106: English Composition	3

Semester 2

WET 106: Wastewater Collection	3
WET 121: Safety, Health, and Security	2
*WET 161: Wastewater I	4
WET 166: Administration/Rules & Regulations	2
*MATH 132: Elementary Geometry OR	
MATH 150: Elements of Statistics (or higher)	3
CHEM 100 – Conceptual Chemistry	3

Semester 3

*WET 206: Wastewater II	5
WET 211: Print Reading/Geographical Information Systems (GIS)	3
*WET 216: Industrial Waste	3
BIO 210: General Biology I	4
CIS 111: Intro to Computer Applications	3

Semester 4

*WET 256: Drinking Water II	4
*WET 261: Advanced Wastewater and Solids Handling	4
WET 266: Equipment Maintenance	3
*ENG 216: Technical Writing OR	
ENG 221: Public Speaking	3
Humanities Elective	3

Additional General Education Requirements

HEAL 106 or HEAL 111	1
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TOTAL CREDITS 70

* Prerequisite or Co-requisite Required. See Course Description.

† Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 137 and MATH 132 (or MATH 150), must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

Water and Environmental Technology (WET)

WET 106 (3 credits) **Wastewater Collection**

This course provides students with an introduction to the practical aspects of operating and maintaining wastewater collection systems with a focus on the knowledge and skills operators need to identify collection system problems and select appropriate methods to solve them. Students learn the components and typical layouts of collection systems and are introduced to safety procedures for construction, inspection, and testing of sewers and the inspection of manholes and underground construction and repair. Students learn the basics of closed-circuit television inspections, clearing stoppages, cleaning sewers, and controlling roots, grease, odors, and corrosion in collection systems, and learn to solve arithmetic problems relating to the operation and maintenance of wastewater collection systems.

WET 111 (3 credits) **Drinking Water Distribution**

Students learn about the practical aspects of operating and maintaining water distribution systems, emphasizing safe practices and procedures, including the role and duties of water distribution system operators, procedures for operating and maintaining clear wells and storage tanks, and components and characteristics of distribution system facilities. The course covers the basics of operating and maintaining distribution systems, maintaining water quality in the system, disinfecting new and repaired facilities as well as water delivered to consumers. Techniques for recognizing hazards and developing safe procedures and programs is also taught.

WET 116 (4 Credits) **Water Resources**

Introducing students to topics such as the properties of water, water resources management, sources of water, management of storm water, and water quantity and quality requirements, this course provides an understanding of the characteristics of surface water and groundwater sources and examines the impact of urbanization on runoff. Students discuss the relationship between the hydrological cycle and the treatment of water and wastewater and gain hands-on experience through laboratory exercises, case studies, and field trips, as appropriate.

WET 121 (2 credits) **Safety, Health, and Security**

An introduction to safety, health, and security procedures to address the hazards and risks associated with operating and maintaining water and wastewater systems. Students learn about industry-accepted safety practices to provide the workforce with a safe working environment. Students learn to identify and predict hazards in the work environment and learn proper use of personal protective equipment. The biological and chemical hazards associated with operating treatment facilities is also covered. Students are introduced to safety and emergency preparedness and the importance of coordinating activities with other agencies.

WET 156 (4 credits) **Drinking Water I**

An introduction to the equipment and processes used in the treatment of drinking water, the course introduces students to different sources of water, reservoir management, and intake structures. Students learn how to safely operate and maintain coagulation, flocculation, sedimentation, filtration, and disinfection processes. Topics such as the control of tastes and odors in drinking water, the Lead and Copper Rule, and solving arithmetic problems related to water treatment plant operations are also covered. Students are introduced to daily operating procedures, regulation of flows, chemical use and handling, records and reports, plant maintenance, safety and security, emergency conditions and procedures, handling complaints, and energy conservation.

WET 161 (4 credits) **Wastewater I**

The course serves as an introduction to the equipment and processes used in the treatment of wastewater. Students are introduced to the different components of wastewater treatment facilities, including racks and screens, grit removal, sedimentation and floatation, trickling filters, rotating biological contactors, activated sludge, wastewater stabilization ponds, and disinfection. Topics such as why we treat wastewater, the duties of a wastewater treatment plant operator, and NPDES permits are also introduced.

Prerequisite: WET 106

WET 166 (2 credits) **Administration/Rules and Regulations**

Covering the major areas of responsibility of a utility manager, the course also includes the legal requirements of federal legislation such as the Americans with Disabilities Act (ADA), the importance of developing policies and procedures for dealing with harassment, grievances, and violence in the workplace. Students also discuss the financial management of a utility, including assessing the financial strength and stability of the utility, budgeting, and funding capital improvements. Finally, the course introduces students to the Pennsylvania Department of Environmental Protection regulations governing water and wastewater treatment facilities.

WET 206 (5 credits) **Wastewater II**

Building upon the topics covered in WET 161, the course covers conventional activated sludge processes, sludge digestion and basic solids handling, effluent disposal, plant safety and good housekeeping, plant and equipment maintenance, laboratory procedures and chemistry, use of computers for plant operation and maintenance, analysis and presentation of data, and records and report writing. Operators also learn to analyze and solve operational problems and to perform mathematical calculations relating to wastewater treatment process control. A laboratory component allows students to gain hands-on experience.

Prerequisite: WET 161

WET 211 (3 credits)
Print Reading/Geographical Information Systems (GIS)

This course introduces students to blueprint reading, geographical information systems (GIS), and the types of blueprints students may expect to encounter working in the water and wastewater industries. This includes land development prints and water and wastewater treatment facility prints. The GIS portion of the course introduces students to GIS mapping as it relates to municipal services.

WET 216 (3 credits)
Industrial Waste

Topics include the operation and maintenance of industrial wastewater treatment facilities, regulations governing industrial waste, types of industrial waste, operation and maintenance of flow measurement equipment, preliminary treatment processes, physical-chemical treatment processes, and physical treatment processes. Students are also introduced to the treatment of metal waste streams.

Prerequisite: WET 106

WET 256 (4 credits)
Drinking Water II

The course introduces students to the practical aspects of operating and maintaining water treatment plants. Topics covered include drinking water regulations (including the Safe Drinking Water Act), iron and manganese control, fluoridation, softening, trihalomethanes, demineralization, handling and disposal of process wastes, maintenance, instrumentation, and advanced laboratory procedures. A laboratory component allows students to gain hands-on experience.

Prerequisite: WET 156

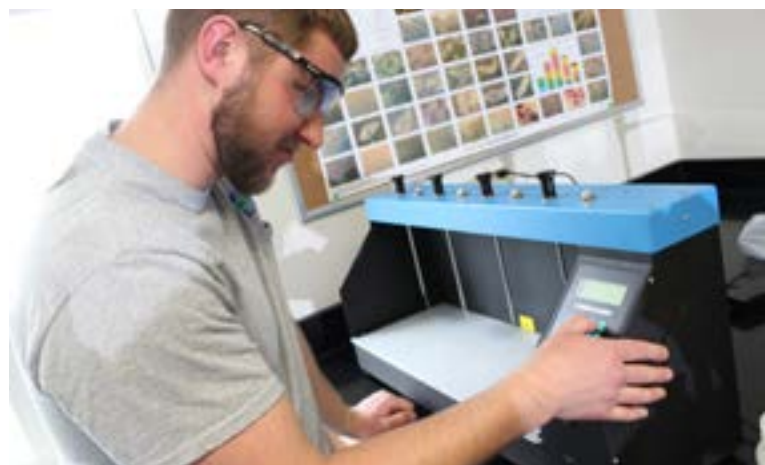
WET 261 (4 credits)
Advanced Wastewater and Solids Handling

Building upon the material covered in WET 161 and WET 206, the course covers the equipment and advanced treatment processes used for odor control, pure oxygen activated sludge treatment, solids removal from secondary effluents, residual solids management, enhanced biological control including nitrogen and phosphorus removal, and wastewater reclamation. Additional topics such as sludge types, characteristics, and quantities; sludge thickening using gravity thickeners, dissolved air flotation units, centrifuges and thermal conditioning as well as wet oxidation and elutriation; dewatering with pressure filtration (plate and frame, belt, vacuum), centrifuges and drying beds; volume reduction using composting, mechanical drying, incineration, and lagoons; and disposal methods for dewatered or liquid stabilized sludge are covered.

Prerequisite: WET 206

WET 266 (3 credits)
Equipment Maintenance

The Equipment Maintenance course will provide students with an introduction to the maintenance of water and wastewater treatment facilities. Fundamentals in electrical and hydraulic systems are covered, including control systems including PLCs and SCADA. Typical maintenance procedures for pumps, blowers and compressors, valves, gauges and thermometers, and alarms will be covered. Students will be introduced to maintenance programs and asset management. Topics such as preventive maintenance, emergency repairs, and scheduled repairs will be covered. Students will be given the opportunity learn maintenance procedures in a laboratory setting.



Welding Technology

What is Welding Technology?

The Welding Technology program provides the opportunity to develop the skills necessary to be a skilled entry-level welder in the welding industry. There is an increasing demand for welders in a variety of industries including light and heavy construction, automobile, aircraft, gas and oil, railroad, machinery and manufacturing industries. These skills are developed through theory and hands-on application into various welding specialties including blueprint reading and advanced computer-aided design; oxy-fuel welding and related processes; basic shielded metal arc welding; basic gas metal arc welding; and basic gas tungsten arc welding.

Students find employment in a wealth of industries related to construction, machinery, manufacturing oil and gas, and transportation industries. Graduates with entry-level certifications will find challenging jobs with opportunity for rapid advancement.

A Graduate of this Program Will be Able to:

- Interpret welding blueprints
- Weld carbon steel, aluminum, and stainless steel with the oxy fuel welding process
- Weld carbon steel with the shielded metal arc welding process
- Weld carbon steel, aluminum, and stainless steel with the gas metal arc welding process
- Weld carbon steel, aluminum, and stainless steel with the gas tungsten arc welding process

Andrea Biesecker, Instructor
AAS: Thaddeus Stevens College of Technology

Michael Marino, Instructor
AAS: Thaddeus Stevens College of Technology

Joshua Seitzer, Instructor
BA: Eastern University
M.ED: Pennsylvania State University



Model Schedule For Welding Technology

Semester 1

WELD 105: Welding Blueprint Reading	2
WELD 110: Oxy-Fuel Welding and Related Processes	3
WELD 120: Shielded Metal Arc Welding I	3
WELD 150: Introduction to Safety	1
†^MATH 126: Technical Math I (or higher)	3
ENG 106: English Composition	3

Semester 2

WELD 155: Gas Metal Arc Welding I	3
*WELD 160: Gas Metal Arc Welding II	3
WELD 165: Gas Tungsten Arc Welding I	3
*WELD 170: Gas Tungsten Arc Welding II	3
*MATH 136: Technical Math II (or higher)	3
*ENG 216: Technical Report Writing	3

Semester 3

*WELD 205: Flux-Cored and Submerged Arc Welding	3
*WELD 220: Shielded Metal Arc Welding II	3
WELD 225: Metallurgy	3
*WELD 230: Special Welding Processes	3
CIS 105: Drawing with Auto Cad	3
Science : Elective	3
HEAL Elective : HEAL 106 OR HEAL 111	1

Semester 4

*WELD 260: Gas Metal Arc Welding III	3
*WELD 270: Gas Tungsten Arc Welding III	3
*WELD 275: Pipe Welding	3
*WELD 280: Non-Destructive Testing	3
Humanities Elective	3
General Studies Elective	3

TOTAL CREDITS 70

* Prerequisite or Co-requisite Required. See Course Description.

† Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 126 and MATH 136, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

^ Minimum Grade Required. See Course Description.

Welding Technology (WELD)

WELD 105 (2 credits)

Welding Blueprint Reading

A study of industrial blueprints. Emphasis on terminology, symbols, graphic description, and welding processes, including systems of measurement and industry standards. Interpretation of plans and drawings used by industry.

WELD 110 (3 credits)

Oxy-Fuel Welding and Related Processes

Provides technical information and hands-on experience in flat, horizontal, vertical, and overhead positions using oxygen-fuel welding and cutting processes. Topics include rod sizes, common flaws, types of welds, brazing operations, and joint designs.

WELD 120 (3 credits)

Shielded Metal Arc Welding 1

This course develops skills in shielded metal arc welding. Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided.

WELD 150 (1 credit)

Introduction to Safety

This course provides the fundamentals of safety in conducting welding operations and provides safety training using Organization Safety Health Administration (OSHA) standards that apply to the programs of study at Thaddeus Stevens College of Technology. The training received covers all topic areas required by the OSHA Outreach Training Program for industry recognized ten hour certification in General Industry Safety.

WELD 155 (3 credits)

Gas Metal Arc Welding

This course develops skills in gas metal arc welding (GMAW). Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided.

WELD 160 (3 credits)

Gas Metal Arc Welding 2

This course further develops skills in gas metal arc welding (GMAW). Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided.

Prerequisite WELD 155

WELD 165 (3 credits)

Gas Tungsten Arc Welding

The course develops skills in gas tungsten arc welding (GTAW). Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided.

WELD 170 (3 credits)

Gas Tungsten Arc Welding 2

The course develops skills in gas tungsten arc welding (GTAW). Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided in advanced skills.

Prerequisite WELD 165

WELD 205 (3 credits)

Flux-Cored and Submerged Arc Welding

This course is an advanced welding application and examines safety, set-up, wire identification, current, shielding gases, operations and troubleshooting techniques of the process. Significant hands-on application designed to provide training in advancement of welding skills using the FCAW and SAW on carbon steels using small and large diameter flux-cored electrodes in all positions on fillet and groove welds.

Prerequisites: WELD 155 and WELD 160

WELD 220 (3 credits)

Shielded Metal Arc Welding 2

This course is an advanced welding application and examines safety, current selection, electrode identification, welding methods, operations, and troubleshooting techniques of the process. Significant hands-on application designed to provide training in advancement of welding skills on carbon and stainless steels using various electrodes in all positions on fillet and groove welds.

Prerequisite: WELD 120

WELD 225 (3 credits)

Metallurgy

This course develops the understanding of physical characteristics and mechanical properties of metals for welding application. This course is designed to provide training in identifying base metals and selection of weld filler metals and understand how welding heat affects base metals during the welding process.

WELD 230 (3 credits)

Special Welding Processes

Significant hands-on application designed to provide training in advancement of welding skills using the submerged arc welding (SAW), stud welding, and tube welding processes on carbon and stainless steels using specialized equipment in various positions.

Prerequisites: WELD 155 and WELD 165

WELD 260 (3 credits)
Gas Metal Arc Welding 3

This course is an advanced welding application and examines safety, set-up, wire identification, current, shielding gases, operations and troubleshooting techniques of the process. Significant hands-on application designed to provide training in development of welding skills on aluminum, carbon and stainless steels on all positions on fillet and groove welds.

Prerequisites: WELD 155 and WELD 160

WELD 270 (3 credits)
Gas Tungsten Arc Welding 3

This course is an advanced welding application, set-up, welding rod identification, current, polarity and high frequency, shielding gases, operations and troubleshooting techniques of the process. Significant hands-on application designed to provide training in advancement of welding skills on aluminum, carbon and stainless steels using various filler metals in all positions on fillet and groove welds.

Prerequisites: WELD 165 and WELD 170

WELD 275 (3 credits)
Pipe Welding

This course develops pipe welding application, preparation and set-up, current, shielding gases, welding techniques and quality inspection of the welds. Significant hands-on application designed to provide training in development of pipe welding skills on carbon steel pipe using various welding processes in all positions on groove welds.

Prerequisites: WELD 120 and WELD 220

WELD 280 (3 credits)
Non-Destructive Testing

This course introduces the welder to non-destructive examination methods to determine the physical properties of a weld and to predict the service life of a weld. Students will learn to differentiate between destructive and non-destructive testing methods to identify discontinuities and defects in welds by using various non-destructive testing equipment to various specifications and codes.

Prerequisite: WELD 105



Electrical Construction and Maintenance

(9-month)

What is the Construction Electrician Certificate?

The Construction Electrician certificate program provides students with the opportunity to acquire the theory and skills needed to gain employment as residential, commercial, and industrial construction electricians. Skills are developed through basic electrical theory and practical work project assignments. This program will give students a broad theoretical and practical background in all aspects of electrical construction.

Graduates of the Construction Electrician program are prepared to find employment as residential, commercial, and industrial construction electricians. Because of the continual growth in building construction, there are many employment possibilities.

A Graduate of this Program Will be Able to:

- Demonstrate appropriate technical skills in the electrical construction field.
- Demonstrate the ability to design, develop, and troubleshoot residential, commercial, and industrial circuitry.
- Complete parts list and order forms that demonstrate knowledge of coding and numbering systems for devices, hardware, and electrical equipment.
- Interpret, develop, and utilize blueprints, schematic diagrams, and wiring plans to perform electrical construction activities.
- Demonstrate the ability to apply OSHA-accepted safety standards as appropriate.
- Demonstrate knowledge of National Electrical Codes that apply to specific occupancies.
- Demonstrate knowledge of test equipment used in troubleshooting and repair of circuits, distribution systems, and electrical equipment.

Michael Oxenford, Instructor
 Bachelor's Equivalency (Industrial Education Electrical
 Technology: Temple University
 Vocational Certificate II (Electrical Technology), Pennsylvania
 Department of Education
 Pennsylvania Competency Certificate (Electrical Technology)
 NCCER Certified Instructor, Electrical
 Occupational Safety and Health Administration (OSHA):
 Construction Safety and Health Certificate
 Master Electrician
 Electrical Apprenticeship: International Brotherhood of
 Electrical Workers, Local Union 743

Model Schedule For Construction Electrician

Semester 1	
ECM 106: AC-DC Fundamentals	5
ECM 111: Residential Wiring	5
ECM 116: Electrical Construction Safety	2
ENG 106: Composition I	3
MATH 126: Technical Math I (or higher)	3
Semester 2	
*ECM 156: Commercial/Industrial Wiring	5
ECM 161: National Electrical Code	3
ECM 166: Blueprint Reading:Electrical	3
ELECTIVE : General Studies Elective	3
ELECTIVE : General Studies Elective	3
TOTAL CREDITS	35

** Prerequisite or Co-requisite Required. See Course Description.*

ECM 106 (5 credits) **AC/DC Fundamentals**

This course presents basic principles, laws, and formulas which relate to alternating (AC) and direct current (DC) circuit applications in electricity. Topics include electron theory, Ohm's Law, series, parallel and combination circuit theory. In addition, capacitive and inductive reactive circuitry (RE, RC, RLC) are discussed.

ECM 111 (5 credits) **Residential Wiring**

This course is an introduction to residential wiring practices and techniques. Topics cover basic residential symbols, blueprint reading, wire diagramming, and the use of applicable National Electrical Codes (NEC). Lab work and projects enable students to develop an understanding of basic residential circuits.

ECM 116 (2 credits) **Electrical Construction Safety**

This course presents Occupational Safety and Health Administration (OSHA) general safety requirements for specific electrical and construction environments. Topics include ladders, scaffolds, lockout and tagging, personal protective equipment (PPE), temporary wiring, harness techniques, and confined spaces.

ECM 156 (5 credits) **Commercial and Industrial Wiring**

Basic theory and laboratory assignments in safety, wiring practices, blueprint reading, and the National Electrical Code (NEC) as it applies to commercial and industrial wiring techniques. Labs enable students to gain practical experience installing and troubleshooting single- and three-phase distribution, transformers, motors, and motor control circuits.

Prerequisite: ECM 111

ECM 161 (3 credits) **National Electrical Code**

This course is designed to provide students with a comprehensive understanding of the National Electrical Code (NEC). Topics include foundational provisions, one-family dwellings, multi-family dwellings, commercial locations, special occupancies, areas and equipment.

ECM 166 (3 credits) **Blueprint Reading: Electrical**

This course is an introduction to basic blueprint reading skills and techniques. Topics cover lines and symbols, pictorial and orthographic diagrams, specifications, scales, prints, and plans. Classwork enables students to develop a basic understanding of construction drawings.

Computer Integrated Machining Certificate

(9-month)

What is the General Machine Certificate?

The General Machine certificate program offers a broad training experience that prepares individuals for entry-level employment in the machining industry. Through a combination of classroom study and assigned lab activities, students acquire essential background information, develop trade skills, and become familiar with production methods and standards common to the industry. Within the lab setting, emphasis is on the practical application of skills. Students will learn to operate a variety of conventional machine tools and computer numerical control (CNC) machines, interpret industrial drawings/blueprints, and use precision measuring and inspection instruments.

Students enrolled in the certificate program may enroll in the associate degree program upon completion of the certificate program. Graduates of the General Machine certificate program are employed as machine operators, machinists, CNC operators, and quality control inspectors.

A Graduate of this Program Will be Able to:

- Demonstrate safe work habits and be conscious of safety when working with machinery.
- Read blueprints, interpret drawings, understand specifications, and establish tolerances.
- Apply mathematics in machine tool technology (speeds, feeds, thread measurement, sine bar, etc.)
- Operate basic machine tools and demonstrate knowledge of their construction in relation to the metal industry.
- Operate abrasive cutting machinery; select and plan machining operations on this equipment.
- Demonstrate skills in quality control, inspection, gauging methods, and production control as they relate to manufacturing design and production.

Alex Surra, Instructor
 MEd, BSE: Millersville University
 AAS: Thaddeus Stevens College of Technology
 Level II Teaching Certificate: Commonwealth of PA
 OSHA Authorized General Industry Trainer:
 Mid-Atlantic OTI Education Center

Model Schedule For Machinist Certificate

Semester 1

CIM 106: Blueprint Reading and Related Math	3
CIM 110: Manufacturing Processes	2
CIM 115: Measurement Systems	2
CIM 118: Lathe and Vertical Milling Machine I	4
CIM 161: Metallurgy	2
MATH 137: Intermediate Algebra (or higher)	3
ENG 106: English Composition	3

Semester 2

*CIM 158: Lathe and Vertical Milling Machine II	3
*CIM 165: Machine Skills Lab I	2
*CIM 175: Computer Numerical Control I	4
*CIM 222: CAD/CAM I	3
Science : ANY Physics or Chemistry Course	3
Humanities : Elective	3

TOTAL CREDITS **37**

** Prerequisite or Co-requisite Required. See Course Description.*

CIM 106 (3 credits)

Blueprint Reading and Related Math

Interpretation of industrial drawings, basic skills in sketching, and applied mathematics.

CIM 110 (2 credits)

Manufacturing Processes

Students will learn laboratory safety and material handling. The physics of metal cutting and the machinability of metals are introduced. Semi-precision and precision measuring instruments are introduced and practiced. Precision layout, bench grinding, surface grinding and power sawing operations will also be introduced and exercised.

CIM 115 (2 credits)

Measurement Systems

Students will learn basic metrology. Precision layout, indirect, and direct measurement will be included. Geometric tolerancing and how GDT features are measured will be covered.

CIM 118 (4 credits)

Lathe and Vertical Milling Machining I

This course introduces students to the lathe and vertical milling machine. Students are exposed to a wide variety of related operations.

CIM 158 (3 credits)

Lathe and Vertical Milling Machining II

Techniques and procedures taught in CIM 118 are enhanced and reinforced. This course introduces students to more advanced techniques and procedures used on the lathe and the vertical milling machine.

Prerequisites: CIM 106, CIM 110, CIM 115 and CIM 118

CIM 161 (2 credits)

Metallurgy

Covering the basic principles of metallurgy, this course clarifies many industrial processes. Students gain an understanding of quenching, annealing, case hardening, tempering, and crystallization.

CIM 165 (2 credits)

Machining Skills Lab

This is a lab intensive course which provides students with extensive hands-on training. Assigned projects aid students in gaining critical experience contributing to a well-rounded machining education.

Prerequisites: CIM 106, CIM 110, CIM 115, CIM 118, and CIM 161

CIM 175 (4 credits)

Computer Numerical Control (CNC) I

CIM 175 introduces the student to basic CNC concepts such as word-address programming, machine set-up, and program proofing. This course serves as an introduction to CNC machines and CNC programming methods and techniques. The programming and set up of a wire electro discharge machine will be covered as well.

Prerequisites: CIM 106, CIM 110, and CIM 118

CIM 222 (3 credits)

Computer-Aided Design and Computer-Aided Machining (CAD/CAM) I

This course introduces the use of MasterCAM® as a tool for defining part geometry and generating CNC machine code. Two-axis and three-axis applications are demonstrated, along with the use of the CAD/CAM applications. The AutoCAD® system is introduced as a drafting system to be linked with MasterCAM®.

Prerequisites: CIM 106 and CIM 118

Masonry Construction Certificate

(9-month)

What is the Masonry Construction Certificate?

The Masonry Construction certificate provides the opportunity to develop the basic skills of a mason and is designed as an introduction to the trade. Students will focus on basic tool skills, trade materials, safety procedures and terminology. Emphasis is placed on brick and block skill sets. These skills are developed through hands-on projects, which are preceded by theory lectures and demonstrations. Special emphasis is placed on the appreciation of the beauty and permanence of brickwork and on the development of pride in workmanship.

Students successfully completing the Masonry Construction certificate program find employment in the field as mason tenders and masons with experience and further education as forepersons or superintendents. Many masons are self-employed.

All students completing the certificate program may enroll in the associate degree program.

A Graduate of this Program Will be Able to:

- Operate masonry tools and equipment safely and effectively.
- Use masonry terminology.
- Read blueprints to estimate materials quantity and pricing.
- Lay out and construct footings.
- Lay out and build a block foundation.
- Apply brick veneering to a structure.
- Construct a masonry arch.

Michael T. Gardner, Instructor
AAS: Thaddeus Stevens College of Technology

Model Schedule For Masonry Construction

Semester 1

MASN 101: Intro to Tools, Safety, and Equipment	3
MASN 105: Introduction to Masonry Construction	3
MASN 110: Development of Masonry Materials	3
MASN 116: Chimney Construction	3
MATH 126: Technical Math I (or higher)	3

Semester 2

MASN 155: Block Construction, Bearings & Anchoring Systems	4
MASN 158: Adhered Concrete Masonry Veneer	2
MASN 162: Masonry Hardscaping Patios & Retaining Walls	2
MASN 167: Masonry Restoration & Building Maintenance	3
MASN 171: Concrete Sidewalks	1
ENG 106: English Composition	3
HEAL 111: Basic First Aid	1
TOTAL CREDITS	31

MASN 101 (3 credits)

Introduction to Tools, Safety and Equipment

Students will be introduced to the tools required for the masonry trade, understand safety standards and practices, and receive training and certifications on various equipment used on a job site.

MASN 105 (3 credits)

Introduction to Masonry Construction

This course will teach the fundamentals of the masonry trade. This will include spreading mortar and striking full joints, laying brick and block to the line, bonding the length and height of a wall, building leads, and hanging a corner pole.

MASN 110 (3 credits)

Development of Masonry Materials

History and the manufacturing of masonry materials. In the manufacturing of materials, there are many different types of brick and block. Students will learn the various names and where the material should be used in a wall. Portland cement comes in different forms and how to properly mix the different types. Students will learn what the different strengths of cement and where they should be used.

MASN 116 (3 credits)

Chimney Construction

Students will understand the difference between and be able to construct properly a single and double flue chimney.

MASN 155 (4 credits)

Block Construction, Bearings, and Anchoring Systems

Students will learn terminology; the placement of anchor bolts, bearing plates, setting lintels, cutting in electrical boxes and door ties. They will be working around conduit, duct work and rebar reinforcement. They will also build a composite wall using block and brick.

MASN 158 (2 credits)

Adhered Concrete Masonry Veneer

Students will learn to use the tools and equipment for installing veneer stone; to apply hanging wire, scratch coat, flashings, vapor barriers, and drain mats; to hang stone; and to point the mortar joints. Students will learn the different types of patterns stone can be laid in.

MASN 162 (2 credits)

Masonry Hardscaping Patios & Retaining Walls

The proper use of masonry products in an outdoor environment. Understand the process to build an outdoor patio and retaining walls using masonry materials.

MASN 167 (3 credits)

Restoration and Building Maintenance

Cover the various materials that go along with masonry products. These would be caulking, waterproofing, patching, repointing, cutting out and repairing damaged areas, and cleaning of masonry. This course will focus on preventive maintenance to stop any further damage of the masonry structure.

MASN 171 (1 credit)

Concrete Sidewalks

Students will learn how to build forms and how to place concrete for a sidewalk.

Welding Technology Certificate

(9-month)

What is the Welding Technology Certificate?

The Welding Technology certificate program provides the opportunity to develop skills necessary to be skilled entry-level welders in the welding industry. There is an increasing demand for welders in a variety of industries including light and heavy construction, automobile, aircraft, gas and oil, railroad, machinery and manufacturing industries. These skills are developed through theory and hands-on application into various welding specialties including blueprint reading and advanced computer-aided design, oxy-fuel welding and related processes, basic shielded metal arc welding, basic gas metal arc welding, and basic gas tungsten arc welding.

Students find employment in a wealth of industries related to construction, machinery, manufacturing oil and gas, and transportation industries. Graduates with entry-level certifications will find challenging jobs with opportunity for rapid advancement.

A Graduate of this Program Will be Able to:

- Interpret welding blueprints
- Weld carbon steel, aluminum, and stainless steel with the oxy fuel welding process
- Weld carbon steel with the shielded metal arc welding process
- Weld carbon steel, aluminum, and stainless steel with the gas metal arc welding process
- Weld carbon steel, aluminum, and stainless steel with the gas tungsten arc welding process

Model Schedule For Welding Technology Certificate Program

Semester 1

WELD 105: Welding Blueprint Reading	2
WELD 110: Oxy-Fuel Welding and Related Processes	3
WELD 120: Shielded Metal Arc Welding I	3
WELD 150: Introduction to Safety	1
[†] MATH 126: Technical Math I (or higher)	3
ENG 106: English Composition	3

Semester 2

WELD 155: Gas Metal Arc Welding I	3
*WELD 160: Gas Metal Arc Welding II	3
WELD 165: Gas Tungsten Arc Welding I	3
*WELD 170: Gas Tungsten Arc Welding II	3
*MATH 136: Technical Math II (or higher)	3
*ENG 216: Technical Report Writing	3

TOTAL CREDITS **33**

* Prerequisite or Co-requisite Required. See Course Description.

[†]Any Student who has taken pre-calculus (MATH 207) or calculus (MATH 213) instead of MATH 126 and MATH 136, must take an additional Gen-Ed elective in order to meet their Gen-Ed requirements.

[^] Minimum Grade Required. See Course Description.

WELD 105 (2 credits) Welding Blueprint Reading

A study of industrial blueprints. Emphasis on terminology, symbols, graphic description, and welding processes, including systems of measurement and industry standards. Interpretation of plans and drawings used by industry.

WELD 110 (3 credits) Oxy-Fuel Welding and Related Processes

Provides technical information and hands-on experience in flat, horizontal, vertical, and overhead positions using oxygen-fuel welding and cutting processes. Topics include rod sizes, common flaws, types of welds, brazing operations, and joint designs.

WELD 120 (3 credits) Shielded Metal Arc Welding 1

This course develops skills in shielded metal arc welding. Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided.

WELD 150 (1 credit) Introduction to Safety

This course provides the fundamentals of safety in conducting welding operations and provides safety training using Organization Safety Health Administration (OSHA) standards that apply to the programs of study at Thaddeus Stevens College of Technology. The training received covers all topic areas required by the OSHA Outreach Training Program for industry recognized ten hour certification in General Industry Safety.

WELD 155 (3 credits) Gas Metal Arc Welding

This course develops skills in gas metal arc welding (GMAW). Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided.

WELD 160 (3 credits) Gas Metal Arc Welding 2

This course further develops skills in gas metal arc welding (GMAW). Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided.

Prerequisite WELD 155

WELD 165 (3 credits) Gas Tungsten Arc Welding

The course develops skills in gas tungsten arc welding (GTAW). Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided.

WELD 170 (3 credits) Gas Tungsten Arc Welding 2

The course develops skills in gas tungsten arc welding (GTAW). Students will learn applications, set-ups, operations, and troubleshooting of these processes. Significant hands-on practice is provided in advanced skills.

Prerequisite WELD 165

Short Term Programs

Metalcasting

Metalcasting is a three-week course designed to develop a metalcasting technician capable of taking molten liquid metal and pouring it into molds to form shapes that are then ground and polished before being finished. Metalcasting technicians work with all types of metals and different molds to make parts for machines and equipment. Students will learn the following:

Students will learn:

- The importance of metalcasting in modern manufacturing
- Properties of metals
- Pattern design and making
- Molding sand and mold-making
- Metal preparation and melting
- Furnace operations to melt metal for casting
- Finishing methods

Production Welding

Production Welding is a five-week course designed to develop a skilled entry-level worker capable of performing various welding techniques needed to support local industrial needs.

Students will learn:

- Basic industrial blueprint reading
- Welding safety and OSHA certification
- Oxy-fuel welding and related processes
- Shielded metal arc welding
- Gas metal arc welding
- Gas tungsten arc welding
- Other welding techniques as appropriate

Technical Studies- Journeyworker

In response to requests for academic recognition of registered apprenticeship training, Thaddeus Stevens College of Technology (TSCT) provides a technical studies–machining technology associate of applied science (AAS) degree. This degree recognizes the goals, general principles, and procedures of registered apprenticeship training. The technical studies–machining technology AAS degree is designed to support lifelong learning and accelerate the achievement of individual career goals. Transferability of the technical studies portion of the AAS degree to four-year institutions will be based on the policies of the accepting institution.

PROGRAM REQUIREMENTS:

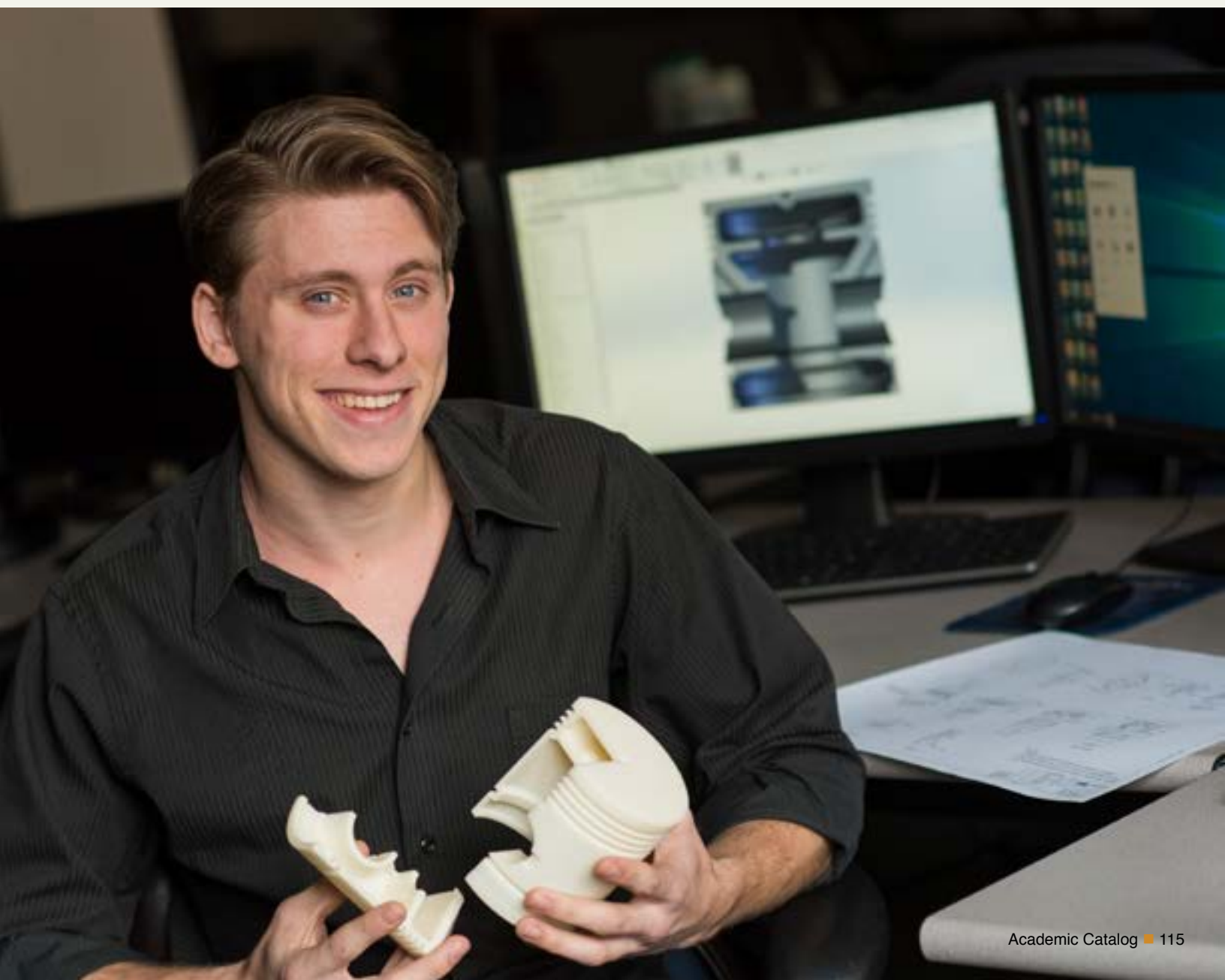
- For admission, students must possess a PA Apprenticeship Completion Certificate issued by the Pennsylvania Department of Labor and Industry.
- Students must complete all prescribed apprentice-related technical instruction.

GRADUATION REQUIREMENTS:

- 70 credit hours
- 46 credits technical studies (awarded as advanced standing)
- 24 credits general studies required from the following subject areas:
 - English (ENG)
 - Mathematics (MATH)
 - Science (includes PHYS, BIO, etc.)
 - Humanities (includes all SOC, ECON, HIST)

Twenty-five percent of the total program credits must be completed at Thaddeus Stevens College.

General Education



Computer Information Systems Courses

Tara Faro, Instructor

MS: The Pennsylvania State University
BS: West Chester University

CIS 105 (3 credits)* **Drawing with AutoCAD®**

Provides an introduction to the use of computer software used to draw. Students learn introductory AutoCAD® commands used to create basic geometric shapes and editing functions used to modify geometry. Measuring and distance specifications for objects is taught along with text creation for use in notes and specifications. Students also learn to use image transfer software that converts pictures and images into line geometry.

**ARCH and MET students may not take this course without consent of their respective program faculty members. ECAD students may also NOT take.*

CIS 111 (3 credits)* **Introduction to Computer Applications**

Introduction to applications for use in the professional and college environment. Students obtain skills in the latest business software. Activities consist of hands-on exercises using the operating system, word processing, spreadsheet, database management, and presentation programs.

**BUAD students may not take. Pre-Major students may not take until the completion of DSOC 010 & DSOC 011.*

CIS 211 (3 credits)* **Microsoft Excel**

This is a comprehensive course in Excel®. It contains everything from basic introductory material to complex business formulas and mapping procedures. Students upon completion will be prepared to take the Microsoft Office User Specialist (MOUS) exam for Excel® certification.

Prerequisite: CIS 111 or obtain instructor's permission with the exception of ECAD students who are not required to take CIS 111. BUAD students may not take.

English Courses

Marla Bucy, Associate Professor

MA: Temple University
BS: Millersville University

Patricia Meley, Instructor

MA: The Pennsylvania State University
BA: Lynchburg College

Lisa-Marie Middendorf EdD, Instructor

EdD: University of Pennsylvania
MA: English from SUNY Brockport
BS: Education from St. John Fisher College

Ann Reading, Instructor

MA: Mercy College
BA: New York Institute of Technology

Melissa Weathers, Instructor

MS: Lincoln University
BS: West Chester University

ENG 106 (3 credits)* **English Composition I**

Develops fluency in writing. Creates interest in and respect for proper usage, sentence structure, and precise expression.

**Prerequisite: Satisfactory Score on Placement Exam*

ENG 116 (3 credits)* **Short Story and Poetry**

Analysis of a variety of short stories and poems with an emphasis on developing interpretive skills. Special attention given to individual presentations and class discussion. technique, symbolism, irony, style, and social significance.

**Prerequisite: ENG 106 with a minimum grade of "C" or instructor permission*

ENG 206 (3 credits)* **Reading and Writing Creative Nonfiction**

This course is an introduction to the genre of Creative Nonfiction and includes a variety of approaches to the genre, both in content and form. Specific content approaches include food writing, travel writing, sports writing, music writing, environmental/place writing, pop culture writing, and immersive journalism. Specific form approaches include vignette, freeform, podcast, blog form, among other non-traditional forms. Students are introduced to these approaches through various shared texts, and students practice these approaches through difference writing activities and assignments.

**Prerequisite: ENG 106 with a minimum grade of "C" or instructor permission*

History Courses

ENG 216 (3 credits)*

Technical Report Writing

Presents technical subject matter with emphasis on intensive practice in the various methods of expository writing. Attention given to various technical forms, including instruction, proposal, progress, and feasibility reports.

**Prerequisite: ENG 106 or instructor permission*

ENG 221 (3 credits)*

Public Speaking

Course includes modes of speech communication, such as demonstration, information, persuasion, and interview.

**Prerequisite: Satisfactory Score on Placement Exam*

ENG 222 (3 credits)*

African American Literature

Course includes a survey of African American literature from slave narratives to the pan-African experience of the 21st Century.

**Prerequisite: ENG 106 with a minimum grade of "C" or instructor permission*

ENG 227 (3 credits)*

Video Games as Literature:

Course explores the role of video games in storytelling and culture. Students will play and analyze several games, while learning key terms in critical gaming and current trends in the gaming industry. Students will also create their own game using Twine technology.

**Prerequisite: ENG 106 with a minimum grade of "C" or instructor permission*

Patricia Meley, Instructor

MA: The Pennsylvania State University

BA: Lynchburg College

HIST 106 (3 credits)

American History I

This course surveys American history from the colonial period to the Reconstruction period following the American Civil War. Students gain an understanding of the major events that have shaped American history; learn how American cultural values and character have developed as a result of these events; understand how myths and stereotypes about American history affect our perception of the past and present; and analyze and understand how economics, politics, society, religion, and geography are interrelated and impact on history.

HIST 111 (3 credits)

American History II

This course surveys American history from the Reconstruction period following the American Civil War to the Vietnam War. Students gain an understanding of the major events that have shaped American history; learn how American cultural values and character have developed as a result of these events; understand how myths and stereotypes about American history affect our perception of the past and present; and analyze and understand how economics, politics, society, religion, and geography are interrelated and impact on history.

Health Courses

HEAL 106 (1 credit)

Fitness and Wellness

Offers information that enables students to take control of their personal health and lifestyle habits so as to make a continuous, deliberate effort to stay healthy and to achieve well-being. Students learn to develop personal lifetime programs that promote fitness, preventative health care, and personal wellness.

HEAL 111 (1 credit)

Basic First Aid

Provides individuals in the workplace the knowledge and skills necessary to recognize and provide basic first aid care for injuries and sudden illnesses until advanced medical personnel arrive and take over.



Mathematics Courses

In programs that require 2 math classes, students may take a higher level math class and a general ed class to make up for the requirement, if they place into said math level.

Renee M. Alshouse, Instructor

MEd: Millersville University

BS: Drexel University

Nasser Bogale, Ph.D., Assistant Professor

PhD - University of the Cumberland

MEd - Millersville University

MA - University College Dublin

BSc - Addis Ababa University

Trina Hess, Assistant Professor

MA: Villanova University

BS: The Pennsylvania State University

Nora Othman, EdD, Assistant Professor

EdD; MS: West Virginia University

BS: University of Miami

MATH 111 (3 credits)*

Business Mathematics

Mathematics skills necessary to do calculations and procedures to operate a successful office or small business. Percentage and simple interest, credit, business ownership, compound interest, payroll and taxes, insurance, mortgages, and home ownership are covered.

**Prerequisite: DMAT 010 (C or above) or Satisfactory Score on Math Placement Exam*

MATH 126 (3 credits)*

Technical Mathematics I

This course is an introduction to the mathematics required of students in technical programs. Designed for students whose academic background does not emphasize algebra or geometry. Includes a review of arithmetic, signed numbers, basic algebra, plane geometry, and other topics. Emphasis is on problem solving.

**Prerequisite: Satisfactory Score on Math Placement Exam*

MATH 132 (3 credits)*

Elementary Geometry

This course is designed for students whose academic background did not emphasize geometry. It covers plane geometry topics, which include basic concepts, parallel lines, triangles, quadrilaterals, and circles. Theorems and postulates are included but emphasis is on measurement and constructions. This course is intended to substitute for Technical Mathematics II for those students who are not required to take General Physics I. It covers the practical geometry that is used in construction majors.

**Prerequisites: MATH 126 or MATH 137*

MATH 136 (3 credits)*

Technical Mathematics II

This course covers solving linear and quadratic equations, functions, graphing linear quadratic equations, polynomials, solving trigonometric ratios, solving right triangles and interpreting basic statistics.

Prerequisites: MATH 126 (C or above) or MATH 137

MATH 137 (3 credits)*

Intermediate Algebra

This course reviews the structure and use of algebra through a combination of topics including polynomials, first-degree equations, quadratic equations, exponents, radicals, and systems of linear equations. Graphing first and second-degree equations is emphasized.

**Prerequisite: DMAT 030 (C or above) or satisfactory score on placement test, or permission of Math Department*

MATH 141 (3 credits)*

Trigonometry

This course shows how mathematics can be applied in a physical setting. The theoretical foundations will be established and explored but emphasis will be placed on practical applications. Highlighted are the trigonometric functions used to solve right triangles, solving oblique triangles using the Law of Sines and the Law of Cosines, and the graphs of the trigonometric functions.

Prerequisite: MATH 137 (C or above)

MATH 150 (3 credits)*

Elements of Statistics

Covers measures of central tendency and variability; probability and normal curve; and sampling and hypothesis testing. Students need to possess mathematical skills necessary to do calculations and derivation of basic formulas.

**Prerequisite: Math 126 with a C or above or higher*

MATH 207 (4 credits)*

Pre-Calculus

Designed to prepare students for continuation into MATH 213: Calculus. Develops the concepts and proficiencies necessary to work successfully in the areas of elementary functions, theory of equations, inequalities, trigonometry and analytic geometry.

**Prerequisites: MATH 137 & MATH 141 (C or above in both)*

MATH 213 (4 credits)*

Calculus

Introduces the concepts and techniques of calculus beginning with functions and limits. Major emphasis is on theory and applications of the derivative, antiderivative, indefinite integral and definite integral, including introductory calculus of trigonometric, exponential and logarithmic functions.

**Prerequisites: MATH 137 & MATH 141 (C or above in both) OR MATH 207 (C or above) or instructor permission.*

Science Courses

David W. Manning, Associate Professor

MA: The Pennsylvania State University
BA: Slippery Rock University

Patricia A. McKinney, Ph.D., Associate Professor

PhD: Harvard University Graduate
School of Arts & Sciences
BS: Eastern Nazarene College

BIO 210 (4 credits)*

General Biology I

This course explores the processes fundamental to life. Laboratory activities reinforce classroom theoretical content. Topics covered include biochemical principles, cell structure and function, intracellular and intercellular transport and communication, metabolic pathways including cellular respiration and photosynthesis, cell reproduction, Mendelian genetics, inheritance patterns and laws, DNA replication and repair, RNA transcription and processing, protein synthesis, regulation of gene expression, biotechnology and key structural and reproductive characteristics of viruses, bacteria, and protists.

**Prerequisites: High school biology and chemistry strongly recommended. Students must be matriculated in an approved TSCT program of study or obtain instructor permission.*

CHEM 100 (3 credits)

Conceptual Chemistry

This course explores inorganic chemistry principles at the conceptual level. Intermittent in-class laboratory activities reinforce theoretical content. Special emphasis is placed on relating chemical principles to industry, the environment, and everyday events. Topics covered include the atomic structure and classification of matter, the periodicity of elements and their properties, intramolecular and intermolecular bonding, chemical reactions including oxidation-reduction reactions, thermochemistry, solutions, acids/bases, water chemistry, gases, and nuclear chemistry.

CHEM 110 (4 credits)*

General Chemistry I

This course explores the fundamental principles of inorganic chemistry. Laboratory activities reinforce classroom theoretical content. Topics covered include the physical states and properties of matter, scientific measurement, problem solving, periodicity of elements, atomic structure, early and modern atomic theory, electron configuration, nomenclature, chemical composition, chemical equations and stoichiometry, chemical reactions, thermochemistry, chemical bonding and molecular geometry, gas laws, and solutions.

Prerequisites: MATH 137 (C or above) or instructor permission

PHYS 101 (3 credits)

How Things Work

This is an introductory physics course that focuses on the ideas, concepts, and engineering behind everyday objects. The history of these objects and their relationships to physical laws are examined. Enrolled students create simple projects to demonstrate their understanding. Only basic mathematical skills are required.

PHYS 106 (3 credits)

Physics for Everyday Life

Brief overview of physics. Includes motion, work, power, energy, and properties of matter, sound, and light. Electrodynamics, atomic physics, and nuclear physics are also discussed. Basic mathematical and algebra skills utilized.

PHYS 113 (3 credits)*

Statics

Elementary, analytical, and practical approach to the principles and physical concepts of statics. Topics include force systems, principles of equilibrium, structural analysis of trusses and frames, friction, centroids, and moments of inertia.

Prerequisites: MATH 137 (C or above) and MATH 141 or instructor permission.

PHYS 213 (4 credits)*

General Physics I

This course is a four-credit, algebra-based physics course in which one of the credits is devoted toward lab work. The course is an in-depth study of statics, kinematics, dynamics, work, power, energy, and the properties of matter.

Prerequisites: MATH 137 and MATH 141 (Both with a C or above) or instructor permission

SCI 107 (3 credits)*

Environmental Science

This course is a comprehensive, multidisciplinary overview of environmental issues and the integral role humans play in shaping our natural surroundings. Topics covered include energy flow, biotic and abiotic factors in ecosystems, environmental law, terrestrial biomes and aquatic ecosystems, population dynamics, renewable and nonrenewable resources, fossil fuels and alternative energy sources, water resources and pollution, air pollution, ozone depletion, climate change, waste disposal, land and food resources, conservation, and sustainable living.

Prerequisite: ENG 106 or instructor permission

Arts, Humanities and Social Sciences Electives

Heriberto Arjona, Assistant Professor

MBA: Universidad Inter-Americana de Costa Rica

BA: Indiana University of Pennsylvania

Vincent E. Miles, Ph.D., Professor

PhD, MA: Indiana University of Pennsylvania

BA: Mansfield University of Pennsylvania

AAS: Thaddeus Stevens College of Technology

ART 106 (3 credits)

Intro to Digital Photography

An introduction to digital photography using digital single lens reflex cameras and basic image editing software. This course includes print production for making black-and-white and color photographs and studio techniques that include portrait lighting and still life photography. No prior photography experience is required. Students use digital photography for the production of a photographic portfolio.

**Graphics students may not take*

BUSN 106 (3 credits)

Small Business Management

Focuses on the world of small business, including getting involved as an entrepreneur; selecting business opportunities; and keeping the business afloat.

ENG 116 (3 credits)*

Short Story and Poetry (H)[§]

Analysis of a variety of short stories and poems with an emphasis on developing interpretive skills. Special attention given to individual presentations and class discussion. technique, symbolism, irony, style, and social significance.

**Prerequisite: ENG 106 with a minimum grade of "C" or instructor permission*

ENG 206 (3 credits)*

Reading and Writing Creative Nonfiction (H)[§]

*This course is an introduction to the genre of Creative Nonfiction and includes a variety of approaches to the genre, both in content and form. Specific content approaches include food writing, travel writing, sports writing, music writing, environmental/place writing, pop culture writing, and immersive journalism. Specific form approaches include vignette, free-form, podcast, blog form, among other non-traditional forms. Students are introduced to these approaches through various shared texts, and students practice these approaches through difference writing activities and assignments. *Prerequisite: ENG 106 with a minimum grade of "C" or instructor permission*

ENG 222 (3 credits)*

African American Literature (H)[§]

Course includes a survey of African American literature from slave narratives to the pan-African experience of the 21st Century.

**Prerequisite: ENG 106 with a minimum grade of "C" or instructor permission*

ENG 227 (3 credits)*

Video Games as Literature (H)[§]

Course explores the role of video games in storytelling and culture. Students will play and analyze several games, while learning key terms in critical gaming and current trends in the gaming industry. Students will also create their own game using Twine technology.

**ENG 106 with a minimum grade of "C" or instructor permission*

ECON 240 (3 credits)

Principles of Macroeconomics

This course covers ideas, models and concepts to give students a better understanding of our nation's and global economies. We will use references from real-world corporations, government policies, and current events, and explore how events and policies change the market equilibrium. Students will analyze macroeconomic data using equations and conceptual graphs.

ECON 230 (3 credits)

Principles of Microeconomics

This course introduces students to foundational principles of microeconomic theory, with an emphasis on economic decisions made at the individual or firm level. It describes and analyzes the interaction of supply and demand and the behavior of the prices of goods and services. It explains the determinations of costs, output, strategic pricing, and purchasing decisions under various market structures in a global economy. In addition, it describes the supply and demand for factors of production with an emphasis on graphical formatting.

HIST 106 (3 credits)

American History I (H)[§]

This course surveys American history from the colonial period to the Reconstruction period following the American Civil War. Students gain an understanding of the major events that have shaped American history; learn how American cultural values and character have developed as a result of these events; understand how myths and stereotypes about American history affect our perception of the past and present; and analyze and understand how economics, politics, society, religion, and geography are interrelated and impact on history.

HIST 111 (3 credits)

American History II (H)[§]

This course surveys American history from the Reconstruction period following the American Civil War to the Vietnam War. Students gain an understanding of the major events that have shaped American history; learn how American cultural values and character have developed as a result of these events; understand how myths and stereotypes about American history affect our perception of the past and present; and analyze and understand how economics, politics, society, religion, and geography are interrelated and impact on history.

§ (H) Denotes course may be taken to fulfill either a Humanities or General Studies Elective

PSY 116 (3 credits)**Introduction to Psychology (H)^s**

Students learn the major specialties of the field and assumptions upon which they are based. Techniques used by psychologists are discussed.

SOC 106 (3 credits)**Principles of Sociology (H)^s**

Provides a systematic interpretation of major elements of sociology, including social dynamics, deviant behavior, social and cultural change, and developing major social trends.

SOC 121 (3 credits)**Critical Thinking (H)^s**

Provides an introduction to critical reading, writing, and thinking. Encourages students to pose questions at appropriate times and to have a generally critical attitude toward advertising and other aspects of popular culture.

SOC 206 (3 credits)**Sociology of Deviant Behavior (H)^s**

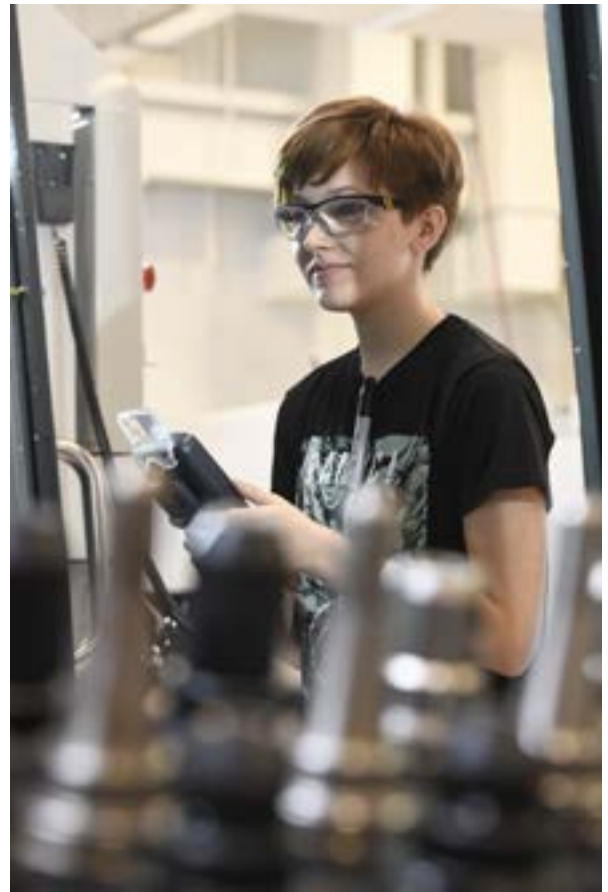
Deviant social behavior are discussed. Topics include development of deviant individual's personality; deviant careers; conflicts between the deviant's and the normative social world. Social techniques and patterns used to resolve such conflicts are also covered.

SOC 216 (3 credits)**Multiculturalism (H)^s**

Introduction to general issues regarding cultural diversity. A focus on complex and diverse group activities in the contemporary workplace with an emphasis on coping skills with persons from different ethnic, gender, religious, and professional backgrounds and perspectives.

SOC 221 (3 credits)**Marriage and the Family (H)^s**

Contemporary American marriage and family patterns are discussed. Topics include historical and cross-cultural perspectives; current trends toward urbanization and changing value systems; and cultural, psychological, and social factors involved in the changing American family.



Special Courses

ST 100–105 (1–5 credits)

Special Topics

Special topics are selected. The topic to be studied is determined by the instructor and approved by the vice president for academic affairs. Credits earned are applicable either as free electives in the program or as credits used for graduation (with the approval of the vice president for academic affairs.)

TECH 100, 199, 200, or 299 (1–3 credits)

Internships

Representing a possibility of four semesters, internships are designed to provide credit for supervised on-the-job work experience directly related to a student's major. Credit varies based upon the total hours worked. The credit-to-work hour ratio is 1 credit = 50 work hours. These courses include employer supervision and evaluation.

ST 111

Astronomy*

A survey of the development of astronomy through the years. Topics covered include the historical evolution of our understanding of our place in the universe, astronomical instruments, the Earth-Moon system, the solar system, the Sun and other stars, galaxies and cosmology.

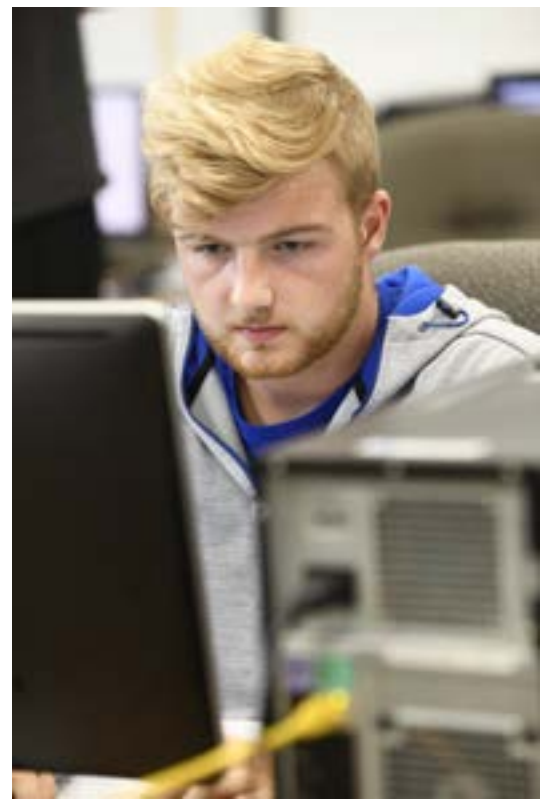
**Fullfills a Science OR General Studies Elective*

ST 141

Personal Finance*

The course is primarily concerned with the management of money from the viewpoint of the individual. Topics to be covered include the consumer's credit buying, borrowing, saving, and investments; purchase of insurance, real-estate and other major items; the problem of taxation and wills, and controlling expenditures through the use of a budget.

**Fullfills a General Studies Elective*



Pre-Major Program

Students may need to complete a course or courses at a foundational level before entering a specific program of study. Students in foundational reading, writing, and mathematics courses are required to earn at least a “C” grade. Students must also pass College Success testing requirements or demonstrate academic excellence in required courses with grades of “B” or higher.

These courses may not be used to meet graduation requirements.

CP 011^ **Career Preparation I**

Students are introduced to eight different areas of technology, drafting, electronics, graphics, woodworking, engineering, plastics, ceramics, and metals. By exposing students to these eight different areas, students gain a better understanding of each area and how it may apply to them specifically.

^Must obtain a grade of “C” or higher for successful completion.

CP 012*^ **Career Preparation II**

This is a continuation of CP 011, where students apply advanced concepts to eight different areas of technology, drafting, electronics, graphics, woodworking, engineering, plastics, ceramics, and metals.

**Prerequisite: CP 011.*

^Must obtain a grade of “C” or higher for successful completion.

DENG 020^ **Basic Writing I**

Intensive review and drill in grammar, usage, and sentence/paragraph construction. For students whose test scores and/or writing performance indicate need for improvement in basic grammar skills. Course must be taken before DENG 021.

^Must obtain a grade of “C” or higher for successful completion.

DENG 021*^ **Basic Writing II**

Intensive review and drill in grammar, usage, and sentence/paragraph construction. For students whose test scores and/or writing performance indicate need for improvement in basic composition skills. Students must earn a “C” or higher in this course before entrance into ENG 106.

**Prerequisite: DENG 020 or by entrance exam*

^Must obtain a grade of “C” or higher for successful

completion.

DENG 025^ **Basic Reading I**

Development and improvement of reading skills. For students whose test scores indicate the need for improvement in basic reading skills and strategies. Course must be taken before DENG 026: Basic Reading II and may not be used to meet certificate or degree requirements. Basic Reading I is the first part of a two-semester course that is only offered in the fall semester.

^Must obtain a grade of “C” or higher for successful completion.

DENG 026*^ **Basic Reading II**

Continuation of development and improvement of reading skills. The second part of a two-semester course for students whose test scores indicate need for improvement in basic reading skills and strategies. Course must be taken after DENG 025: Basic Reading I and may not be used to meet certificate or degree requirements. Basic Reading II is the second part of a two-semester course that is only offered in the spring semester.

**Prerequisite: DENG 025 or by entrance exam*

^Must obtain a grade of “C” or higher for successful completion.



Pre-Major Program

DMAT 010

Fundamentals of Mathematics

Development and improvement of math skills. Fundamentals of Mathematics covers whole numbers, fractions, decimals, percent, measurement, and various other essential topics. For students whose test scores indicate the need for development and/or improvement in fundamental math skills, course must be taken before MATH 126: Technical Mathematics I or MATH 111: Business Mathematics; students may be required to complete DMAT 010 prior to enrollment in DMAT 030. DMAT 010 may not be used to meet certificate or degree requirements. Fundamentals of Mathematics is a one semester course offered during both semesters and summer terms.

^Must obtain a grade of "C" or higher for successful completion.

DMAT 030*^

Introduction to Algebra

Develops fundamental algebra skills necessary in vocational/technical occupations. Topics include real numbers, solving first degree equations, exponents, polynomials, and factoring. This course may not be used to meet degree requirements.

**Prerequisite: DMAT 010 or by entrance exam*

^Must obtain a grade of "C" or higher for successful completion.

DSCOC 010^

Success Strategies

Encourages students to live healthy lifestyles, develop academic skills, foster habits of punctuality, and maintain good attendance records in all classes. Time management, positive attitude, and goal orientation are also covered. Included in this course is a 2.5 hour lab for developing academic technology skills.

^Must obtain a grade of "C" or higher for successful completion.

DSCOC 011^

Success Strategies Lab

Provides students with an opportunity to acquire fundamental computer skills and practical knowledge in applications needed for success in college coursework. Hands-on topics include use of the College portal for access to College and course materials, email guidelines, Internet research methods, file management and organization, and software for assisting in compiling research ideas and notes. In addition, exercises will be completed related to word processing (outlining tools, tables and columns to organize lists, report formatting), spreadsheet fundamentals (calculating GPA, budgets, measurement conversions and formulas, timesheets) and presentation software (developing projects).

^Must obtain a grade of "C" or higher for successful completion.



College Information



Admissions Policy

Thaddeus Stevens College provides educational opportunities and life experiences to individuals who have the intent, desire, and ability to seek advanced technical education. All programs of study terminate in an associate of applied science (AAS) degree with the exception of all certificate programs.

Since each technical area requires different abilities, admissions standards vary from program to program. For example, applicants for the Electrical Technology program are expected to have a more extensive background in mathematics than applicants for Collision Repair Technology or Plumbing Technology. Given an excess of qualified applicants for many programs, meeting the minimum requirements will often not be sufficient for admission. In that case, the most financially deserving and academically best prepared of the applicants will be selected. Others will be placed on a waiting list.

At a minimum, applicants must have a high school diploma or its equivalent. Questions regarding the admissions standards of a specific technical program should be directed to the Office of Admissions.

Thaddeus Stevens College reserves the right to deny admission or readmission to any individual if, in the opinion of College authorities, such is not in the best interest of the student or the College.

Admission is offered without regard to age, color, sex, handicap, race, religion, creed, national origin, veteran status, or political affiliation. All applicants, however, must be residents of Pennsylvania.

Title IX Coordinator: Betty Tompos, 717.391.6947

College Information and Admissions Applications

All graduates of accredited secondary schools or general equivalency diploma (GED) are eligible for admission to Thaddeus Stevens College. Admission into a specific technical area is based upon evidence of scholastic readiness and personal interest.

To request information or submit an application, visit the College's website at www.stevenscollege.edu or write to: Office of Admissions, Thaddeus Stevens College of Technology, 750 East King Street, Lancaster, PA 17602. You may also call 1-800-842-3832 or 717-299-7701 between 8:00 am and 4:30 pm, Monday–Friday.

Program Choice

When applicants apply for admission to Thaddeus Stevens College, they generally know which major interests them. Candidates who are uncertain should ask a high school counselor or a counselor of the Pennsylvania Career Link about a career choice. Public libraries are also helpful, and Thaddeus Stevens College can help make a final decision. Call the Office of Admissions to speak with a staff person about visiting the College or visit our website at www.stevenscollege.edu.

Admissions Procedure

Once completed, submit the online application and forward the nonrefundable application fee to the Office of Admissions, 750 East King Street, Lancaster, PA 17602. There is no deadline for receipt of applications; however, applications are considered in the order received. Applicants who qualify for the Thaddeus Stevens Grant and who meet our admission standards will be given preference.

All applicants must possess a high school diploma from an accredited high school or a high school equivalency diploma (GED). Request that your high school guidance office forward a copy of your transcript to Thaddeus Stevens College beginning with the ninth grade. This transcript should reflect class standing, cumulative grade point average, attendance, and keystone test scores. If taken, SAT and/or ACT scores should also be submitted. In order to be considered for admission to the College, students must have a high school cumulative grade point average of 2.0 or higher, have a grade point average of 2.0 or higher in math, English and science, and have scored proficient in all PSSA test areas.

Upon submission of the high school transcript, Keystone scores, and requested essay, these documents will be reviewed by the Dean of Enrollment Services. If a student meets these qualifications, he/she will then be advised to participate in entrance testing. The purpose of entrance testing is to determine a student's preparation for college-level work. The results may indicate that the student needs a summer, a semester, or a year of remedial coursework to prepare for the credit-bearing courses required for his/her degree. Applicants may elect to take the ACT or SAT test at one of several locations in Pennsylvania. Applicants unable to take the ACT or SAT may elect to visit the Thaddeus Stevens College campus to take an entrance test. Because each curriculum has specific academic requirements, applicants are admitted to a curriculum based on identified criteria and entrance test scores.

Drug Policy

Thaddeus Stevens College requires all students enrolling in safety-sensitive programs to successfully complete a drug screening prior to acceptance into those programs. The Office of Admissions will notify students eligible for matriculation into a program of study with instructions for conducting drug screening. Once an applicant has successfully completed the drug screening process, the College will notify the applicant. Applicants who successfully complete the drug screening will not be charged for the screening. However, applicants who fail the screening will be charged for the test and will have to wait at least six months to reapply.

The screening is a requirement. Eligible applicants who fail to provide a successful drug screening in a timely basis will lose their reserved slot in their desired program of study.

Finally, the College reserves the right to have any enrolled student screened for illicit drug use based upon reasonable suspicion and through random drug testing.

If a student is requested to be screened, he/she will not be allowed back in the class until proof of screening. Enrolled students who fail the drug screening will be dismissed from school and will be charged for the cost of the drug screening.

Selection of Students

The following represents a priority listing of the selection criteria for admission to Thaddeus Stevens College of Technology:

- Family status; indigent orphans given preference
- Financial need
- Academic achievement
- Entrance evaluation results
- Number of applicants for the program
- Date application is received (qualified Stevens Grant students given preference)

Summer Program

Academic Bridge Program

A summer session for academically underprepared students, who meet specific admission requirements, is available in a 5-week term from late June through early August. These courses are for students who need to develop basic educational skills before the start of the regular semester. Counselors, mentors, and tutors are also available for students who need additional support.

At the conclusion of the summer semester, students are evaluated for academic and personal progress. Those who successfully complete the summer program are recommended for matriculation into degree programs in the fall.

Academic Program

A 10-week summer session is available for students who want to make progress in their degree program. Credit-bearing courses in science, math, and/or computer instruction may be offered.

Entry into the summer program is determined by the director of admissions.

Pre-Major Program

Students whose placement evaluation indicates a deficit in foundational skills associated with reading, writing, and/or mathematics are required to successfully complete foundational courses before acceptance in technical programs. Success in a foundational course is indicated by earning a grade of "C" or better in all foundational courses and achieving required entrance test scores. Foundational students who do not achieve successful entrance test scores may request a waiver for demonstrated academic achievement at the college level.

Students enrolled in foundational courses will be scheduled for courses during the fall and/or spring semester or may qualify for TSCT summer program.

Foundational courses are calculated in the students' overall course load and applicable in determining full-time or part-time status and meeting financial aid standards. However, credit hours earned do NOT tabulate toward graduation credits and are considered foundational courses. Students earn a grade point average that is based on their overall cumulative level of performance in each course. Grade point

averages in foundational courses remain separate from those earned in college-level courses. Foundational courses have a 0 level designator.

Entry into the pre-major program is determined by the Dean of Enrollment Services.

Re-Enrollment

Students who have attended Thaddeus Stevens College and wish to re-enroll must apply for re-admission through the Office of Admissions. Appropriate fees must again be paid. Graduation requirements are those in effect at the time of re-enrollment. Special circumstances may be appealed to the vice president for academic affairs. Students are reviewed by several offices and may be asked to complete additional steps.

Financial Aid at TSCT

Students at Thaddeus Stevens College may be eligible for the following financial aid:

- Federal Pell Grants
- Pennsylvania Higher Education Assistance Agency (PHEAA)
- Federal Direct subsidized and unsubsidized student loans
- Federal Direct PLUS Loan- Parent Loan
- Scholarships via various donors
- Student alternative loans
- Thaddeus Stevens Grant
- Federal Supplemental Educational Opportunity Grant (FSEOG)

Additional information and application forms may be secured from the Office of Financial Aid and Registration, located in Room 105, Hartzell Hall or online

Grade Level Advancement Policy for Direct Loan Consideration

- Students who are in the pre-major program or in the first year of their program are eligible to borrow up to \$5,500 as a dependent student or up to \$9,500 as an independent student.
- Students who are in the second year of their program are eligible to borrow up to \$6,500 as a dependent student or up to \$10,500 as an independent student.

Types of Aid Available

Federal Pell Grant

Federal Pell Grants are determined by the Department of Education based upon demonstrated financial need and full or part-time enrollment at Thaddeus Stevens College. To apply for a Federal Pell Grant, students must complete the FAFSA. Our priority deadline is March 1 of each year. Once the College receives your FAFSA and you have received an offer of admission, we will begin to process your application to ensure everything was completed accurately.

- U.S. Department of Education determines student's eligibility from information gathered on the FAFSA application
- Meet Satisfactory Academic Progress
- Awards depend on financial need and enrollment status
- Funds are disbursed via EFT to students accounts each semester.

Federal Supplemental Educational Opportunity Grant (FSEOG)

Federal grant funds awarded to our neediest students who complete the FAFSA application early. To be considered students must meet the following criteria.

- Federal Pell grant eligibility based on FAFSA.
- Meet Satisfactory Academic Progress
- Awarded to students who complete the FAFSA in October of the previous year.
- Preference is given to resident students
- Awards are generally \$3,000 for the year, until funds are exhausted.
- Funds are disbursed via EFT to students accounts each semester.

Pennsylvania State Grant (PHEAA)

The Commonwealth of Pennsylvania awards grants to state residents pursuing postsecondary degrees, including associate degrees. To be eligible for a PHEAA grant, you must complete the FAFSA by May 1 of each year. PHEAA will contact you via mail or email requesting additional information to determine eligibility.

Your grant award will be re-evaluated each year on the basis of continued need, your academic progress and to ensure you are taking at least six credits per semester. Credits in remedial courses may be eligible depending on how many regular credits you are also taking. They usually will require additional information to determine eligibility.

Create an account at www.PHEAA.org to track your PHEAA eligibility

- FAFSA completed by May 1st
- Graduate from a Pennsylvania High School
- Pennsylvania Resident
- Enrolled at least half time (6 credits)
- Enrolled in a 2 year program
- Meet satisfactory academic progress (as defined by PHEAA)
- Create an account on www.aessuccess.org to view up to date State Grant information

Stevens Grant

The Stevens Grant assists those students that are financially disadvantaged.

Eligibility Criteria:

- FAFSA processed by May 1st. Late applicants may receive a reduced award.
- Completed all required paperwork with the FA office by October 1st for Fall and Feb 1st for Spring
- Pell Grant Eligibility as determined by the FAFSA
- Meet Satisfactory Academic Progress
- Enrolled in 12 or more credits and working towards degree requirements
- In some cases students that are taking less than 12 credits but are taking a full load of their program courses according to the model schedule and have full filled all general education requirements may be eligible on a prorated basis.
- Complete all PHEAA paperwork

Grant Covers:

- Remaining costs after Pell, PHEAA, outside scholarships, and EFC are taken into consideration.
- If the EFC is greater than zero students are responsible for the amount of the EFC. A student loan will be awarded as an option to cover the EFC.
- Costs can include, tuition, fees, room and board (7 day meal plan for resident students and 5 day meal plan for commuter students)
- Text Books and tools will be lent to students by instructors on the first day of the semester
- All books must be returned at the end of each semester.
- If a student withdraws or is dismissed prior to graduation they must return their tools or be charged a replacement fee.

Length of time:

- 4 semester maximum
- Pre-Majors may receive the grant for 6 semesters

Maintaining Eligibility:

- Complete 10 hours of community service
- Continuous Full time enrollment
- Maintain a 2.0 GPA
- Uphold the Colleges Code of Conduct

Loans

A loan is a type of financial aid that is available to students and/or parents to assist in covering educational expenses that are not covered by grants and/or scholarships. There are two types of student loans: **federal** and **private**.

Types of Loans

Federal Direct Subsidized - awarded to students with financial need. The U.S Department of Education pays the interest on the loan while you are in school.

Federal Direct Unsubsidized - Interest accumulates while students are in school. It is also a non-need based loan.

Parent PLUS Loan - Your parents may qualify for a Federal Direct Parent PLUS Loan to help you pay for college. This type of loan enables your parent to borrow up to an amount equal to your total cost of attendance at TSCT minus any other financial aid you receive.

- Loans where the first disbursement is made on or after October 1, 2019, will have a fee of 4.236%.
- Fixed interest rate of 7.08% for the 2019-2020 academic year.
- Alternative Loans- If you require additional funds after all Federal-aid and institutional aid has been awarded, you may apply for an alternative student loan. These loans typically require a cosigner and are from a private lending institution.
- Variable interest rates
- Variable fees
- Several programs are available for your consideration. Loan terms vary, so you will want to be a conscientious consumer and review multiple loans options.

Alternative Loans - If you require additional funds after all Federal-aid and institutional aid has been awarded, you may apply for an alternative student loan. These loans typically require a cosigner and are from a private lending institution.

Assistance with Financial Aid Applications

Assistance in completing the financial aid application is available from the Office of Financial Aid.

Satisfactory Academic Progress (SAP)

Students attending Thaddeus Stevens College of Technology who wish to receive financial aid, in addition to meeting other eligibility criteria, must be in good academic standing and making satisfactory academic progress (SAP) in their degree or certificate program. SAP will be reviewed at the end of each term or semester once grades are posted. If a grade change should occur after this process, the students' progress will be reevaluated. Students who fail to make progress will first be placed on a financial aid warning for SAP. Students who fail to make progress on a semester they are on warning will become ineligible for financial aid until they have met the SAP requirements. Future financial aid disbursements will be on hold until SAP requirements are satisfied. Students may appeal being ineligible for failure to meet SAP requirements. If an appeal is granted, the student will be placed on financial aid probation for SAP. Any student who fails to meet the requirements of SAP while on probation will become ineligible for financial aid until they have met all SAP requirements. This cannot be appealed.

a. Quality Of Progress - "Good Academic Standing" (Effective Fall 2017)

- Students requesting aid must maintain a 2.0 GPA. This requirement includes pre-major coursework. If a student falls below the required 2.0 GPA they will be placed on financial aid warning for the following semester in which they must bring their GPA up to the required 2.0.
- If a student fails to meet the requirements during the warning period they will lose their financial aid until they have met the GPA requirement. Loss of Financial Aid includes Title IV funding and institutional funding.

b. Quantity Of Progress - "Pace Of Unit Completion"

TSCT students must complete at least two-thirds (67%) of all units in which they originally enroll from the time of first attendance in their program. Thus, a first-term TSCT student who originally enrolls in 9 units, withdraws from 3 units, and successfully completes the remaining 6 units, would be meeting the quantitative measure requirement since the student did pass at least two-thirds (67%) of the units in which he or she originally enrolled.

Students requesting aid must make progress toward a degree as follows:

- Full-time: 12 units per term and/or 24 units per year (complete average of 8 per term)
- $\frac{3}{4}$ time: 9 units per term and/or 18 units per year (complete average of 6 per term)
- $\frac{1}{2}$ time: 6 units per term and/or 12 units per year (complete average of 4 per term)

These grades are considered to demonstrate satisfactory course completion: A, B, C, D, T and P.

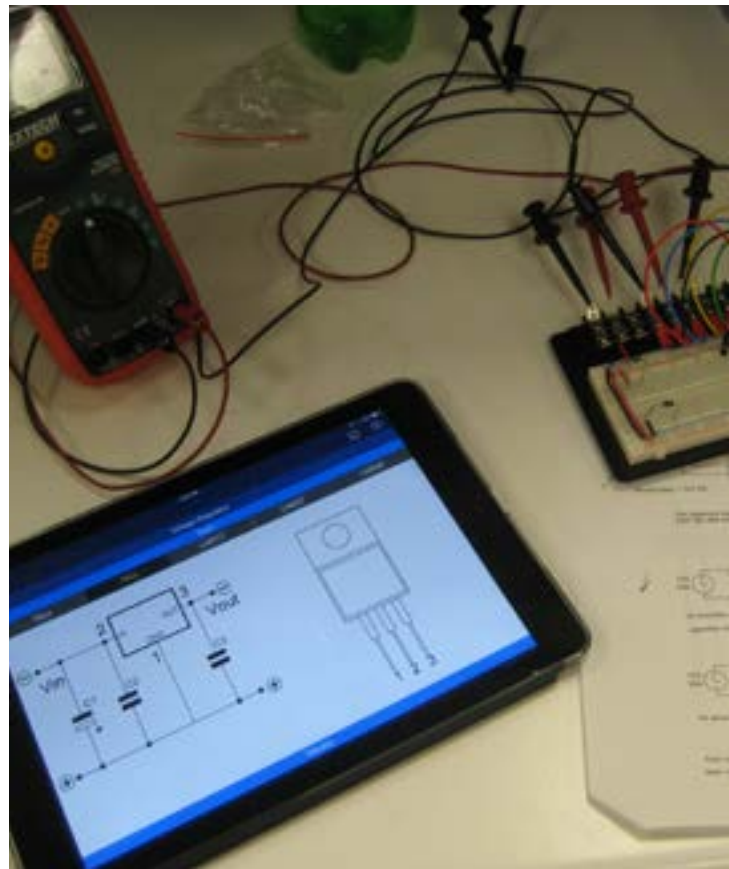
These grades do not demonstrate successful course completion: F, I, W, WIP, WF and WP.

- Incomplete grades will not count toward your completion rate (pace) in the term in which they are received but will be evaluated the following term.
- If a student falls below the cumulative minimum 67%, they will be placed on financial aid warning, such students will be given the following term (semester) in which to raise their cumulative completion rate above the required 67%.
- If a student fails to meet the requirements during the warning period they will lose their financial aid until they have met the requirements listed below. Loss of Financial Aid includes Title IV funding and institutional funding.
- Transfer credits will be counted as successful completion in the pace calculation but do not count in the GPA calculation.
- Repeat courses will count as attempted each time they are part of an enrollment. They will count as completed the first time a satisfactory grade is earned for that course.

c. Quantity Of Progress - "Maximum Time Frame"

Students must finish their academic program within 150% of the published length of the program.

For example, a student in a 61 credit hour Associates program full-time, should be able to earn the degree in three years taking no more than 92 credits.



d. Appeals

All students have the right to appeal. This may be done by completing an appeal form and submitting it to the Financial Aid Office. The Director of Financial Aid will review cases on an individual basis to determine if mitigating circumstances are responsible for poor progress. Mitigating circumstances may include but are not limited to:

- a.) illness or injury of the student
- b.) death of a close family member

All circumstances must be documented. Students will be informed in writing of the appeal outcome. If a student appeal is granted, they will be given an academic plan. The academic plan will outline what the student must do to regain SAP. Failure to adhere to the academic plan will result in the student becoming ineligible for financial aid in future semester until SAP is met. In the case of a denial, students will be informed in writing of what they must do to be reinstated for financial aid.

Student/Course Transfer

Students who desire to transfer credits to Thaddeus Stevens College of Technology (TSCT) must have taken the classes at a college that is accredited by a regional or national accrediting agency and must have earned a grade of "C" or higher in those classes. Students may only transfer general education classes. All classes that are non-general education classes must be taken at TSCT. Transferred classes are recoded with a "T" (transfer credit) in place of a merit grade. These classes do not factor into a student's GPA.

Students should request that the college(s) where courses were taken mail an official transcript to the Office of Financial Aid and Registration at Thaddeus Stevens College. The Office of Financial Aid and Registration will evaluate all course descriptions. The registrar reserves the right to request a syllabus and/or additional information in determining course transferability. The Office of Financial Aid and Registration will notify students, as well as their advisor, as to which classes meet the requirements for transferring.

Transfer to 4-Year Institutions

Students who have earned college credit can sometimes transfer those credits to other colleges/universities since Thaddeus Stevens College of Technology is accredited by Middle States. Students should contact the college/university they are interested in transferring to in order to determine what credits will transfer. Information on articulation agreements is available in the Academic Affairs Office.

Tuition and Related Costs

Thaddeus Stevens College reserves the right to change the tuition and other costs/fees as required. Contact the Office of Admissions for the latest figures.

Tuition and related fees are determined by the Thaddeus Stevens College Board of Trustees.

Students not fulfilling contractual obligations will not be allowed to continue the following semester. Contractual obligations include charges for outstanding library fines, residence hall charges, charges for damaged or lost property belonging to the College, bookstore obligations, and payment of tuition, room and/or board.

Related Fees

Application Fee/nonrefundable.....	\$45
Student Activity Fee/nonrefundable: (due with agreement for admission)	\$25
Parking Permit Fee/nonrefundable (optional):.....	\$15
Replacement ID Card Fee.....	\$5
Temporary ID Card Fee.....	\$3
Overdrawn Check Fee.....	\$31
Late Payment Fee	\$50
Diploma Reprint.....	\$10
Transcript Fee (each, after 2nd transcript)	\$4.25

The Business Office will bill students for all claims for damages to or loss of College property as the damages or losses occur, as well as at the end of the academic year. Students are responsible for paying these charges within 30 days from the date of the billing. The Business Office will assess a late payment fee of \$50 per month against any student with a delinquent balance.

The College will seal all student records until claims for damages and/or loss of school property are settled. Students with delinquent accounts will not receive grades, transcripts, or degrees until they pay their outstanding balance in its entirety. Furthermore, the College will turn all delinquent accounts over to the Attorney General's Office for collection.

Tuition Payment Plan

Students may pay their tuition in its entirety by the beginning of the fall/spring term or in 3 equal installments as follows:

- approximately 1 month prior to the start of the semester
- at registration, or, in the case of the spring semester, on or before the 1st class day
- one month after registration with the final spring payment due 1 month after the first class day

To be eligible for the payment plan, the student must make the first payment on time. Exceptions to this will only be granted by the vice president for finance and administration.



Books and Supplies

Students are required to buy books and supplies. Students who receive the Thaddeus Stevens Grant will have their books loaned to them; students must return the books or pay for the purchase of the books when their course or program of study has been completed. If books are not returned, the cost for the books will be charged to the student's account and remaining unpaid balance will be referred to a collection agency.

Textbooks are available at competitive prices through the College's bookstore provider online or at the bookstore location. Prices of books and supplies vary according to each major.

Tools

When students are accepted into their majors, they are expected to buy all required tools or supplies. A list of required tools will be located on the College's website. These purchases must be made prior to the beginning of the fall semester and will be listed on the website under the appropriate course of study for the current semester.

Students who receive the Thaddeus Stevens Grant will have their tools loaned to them. Upon successful completion of their first year of study, the College will award students with these tools. Students who do not successfully complete their first year of study must return the tools. If these tools are not returned, the cost of the tools will be charged to the student's account and any remaining unpaid balance will be referred to a collection agency.

Refunds from College Termination

Students who wish to decline admission or who withdraw from the College are required to notify the College 14 days prior to the first day of classes to receive a 100% refund. Students who notify the College in writing of their denial of admission or who withdraw from the College fewer than 14 days before the first day of class but before the first day of class will be charged 20% of their tuition and room charges for that semester. Students who do not notify the College in writing prior to the first day of classes of their denial of admission or who withdraw from the College will be charged 50% of tuition and room charges for that semester.

In the event of withdrawal from classes prior to the completion of the semester, tuition, room, and board charges will be reduced according to the following refund policy:

Institutional Refund Policy

This policy applies to tuition and room charges:

Withdrawal Date

Up to two weeks prior to semester start date:	80%
Up to one week after semester start as a no show:	50%
Up to two weeks after semester starts in attendance:	70%
Two to three weeks after semester starts in attendance:	60%
Three to four weeks after semester starts in attendance:	50%

This policy applies to meal plan charges:

Withdrawal Date

First week of the semester:	70%
Second week of the semester:	60%
Third week of the semester:	50%

Student activity fee is not refundable.

Procedures to Withdraw from A Class

Students may withdraw from a class between the beginning of the second week and the 14th week of a semester. Students will receive a "W" grade that will appear on the transcript but not impact their GPA. Failure to follow the steps below could result in still being charged for the semester in which students were enrolled but did not attend.

Students should meet with their academic advisors for consultation concerning the effect(s) withdrawing will have on their continued studies and transcript records. Students should return any materials or properties of the College that they may have in their possession to the appropriate parties, to avoid being billed for those items.

Students who earn an "F" for cheating in a course may not withdraw from that course.

Procedure for Withdrawal from College

Prior to making the decision to withdraw from Thaddeus Stevens College, students are encouraged to discuss this decision with a counselor. A counselor can assist students with developing alternative plans to remain enrolled, as well as help students understand how withdrawing may affect future educational plans, financial aid, insurance coverage, etc.

All students who wish to withdraw from the College must do the following:

- All students regardless of the reason, must complete a school withdrawal form. This applies to all students, whether withdrawing during or between semester. A student may not withdraw retroactively. The form will be processed on the date of receipt, not when it was signed.
- If a student stops attending classes, or does not return after a semester of enrollment and fails to complete the Withdrawal from the College form, he or she will be dismissed from the college for excessive absenteeism and charges will be applied.
- A student who wishes to withdraw for medical reasons and would like to return in the future must meet with a college counselor to discuss next steps.
- When a student withdraws from the college during a semester, grades of "WS" will be assigned to the student up until the deadline to withdraw from a course without penalty, as indicated on the College Calendar. Grades of Withdrawal Pass "WP" or Withdrawal Fail "WF" will be assigned when a student withdraws during a semester and after the deadline to withdraw from a course without penalty, as indicated on the College Calendar.
- A student that is called to active military duty and must withdraw from the college after the deadline to withdraw without penalty will be given grades of "WS".

Employment Opportunities

Some students take advantage of the many opportunities of working while attending Thaddeus Stevens College. See Student Services hiring and application details.

Veteran Administration Benefits

All full-time programs at Thaddeus Stevens College of Technology are approved for veterans. If eligible for education benefits as a veteran or as a child of a deceased or disabled veteran, the student should adhere to the following procedures to ensure receipt of benefits in a timely manner:

Contact the local VA office, discuss school plans with them, and obtain an application for benefits.

Provide VA Certifying Official at Thaddeus Stevens College with documentation of benefits and a copy of the DD214, if applicable.

Once the student has reported for classes, the College will certify enrollment to the Department of Veterans Affairs.

Previous Education/Training

Appropriate credit is given for comparable previous education and training; thus, the training period is shortened accordingly. Further information is available in the Office of Financial Aid and Registration.

Tuition Refunds/Credits When Called into Active Duty

Whenever students, as members of the Pennsylvania National Guard or reserve component of the Armed Forces of the United States, are called or ordered to active duty, a leave of absence must be granted.

The students, when released from active duty, are entitled to and restored to the educational status previously attained without any loss of credits earned. The College will refund tuition and fees paid or credit the tuition and fees to the next semester or term after termination of military leave at the option of the student.

The College will give students the option of a 100% refund of tuition and fees or a credit for the next semester's tuition and fees. If students take a refund and return, the refund shall be at the existing rate.

Campus Life



Learning Resources Center

The Kenneth W. Schuler Learning Resources Center (LRC) Library is open to all members of the college community. The library is staffed by professional librarians who strive to provide students with the information they need to successfully complete their technical training programs and earn their degrees.

The library is also committed to maintaining substantial collections of supplemental and recreational materials. The library materials in the Learning Resources Center (LRC) are for the use of Stevens' students, alumni, faculty, and staff. The collection is open and available to any member of the Stevens community holding a valid, legible ID card.

Hours of Operation during the Academic Year

Mon-Thurs 7:00 am - 10:00 pm

Fri 7:00 am - 5:00 pm

Sat Closed, Sun 2:00 pm - 10:00 pm

(Holiday and summer hours vary and will be posted.)

Lending

The library has books, DVDs, journals, magazines, laptops, games, calculators, headphones, phone chargers, and more available to check out.

Computer Lab

Computers are loaded with Microsoft Office and specialized technical software available for student use.

IT Help Desk

A help desk is staffed Mon-Thurs from 9:00 am to 7:00 pm, and Fri 9:00 am to 4:00 pm. Students needing any technical help are encouraged to stop by.

Online Resources

The library subscribes to many online resources that can be accessed 24 hours a day at <https://stevenscollege.libguides.com> or through the library page of the portal.

Interlibrary Loan

Interlibrary Loan services are available to current TSCT students, faculty, staff, and administrators.

Printing & Copying

Printers and a copier are available for student use.

Group Study Rooms

Group study rooms with AV equipment and white boards are available.

Lounge Areas

Several seating and study areas can be found throughout the library.

Seminar Room

A seminar room is located on the ground floor of the building.

Archives

Historically significant documents, artifacts, and other materials pertaining to the college and its founder, Thaddeus Stevens, are on display. The archives are open during the library's hours of operation, provided a staff person is available to accompany visitors.

The LRC is also home to the Math and English Tutoring Labs, a computer classroom, and the Academic Center.

See the library page of the portal for more information.

Student Academic Support Center

Thaddeus Stevens College offers free tutoring services for ALL courses to ALL students who need and request tutoring. The tutoring labs are located in the Student Academic Support Center, which is an attached wing of the Learning Resources Center (library). Tutoring is provided by professional tutors and peer tutors. English and math labs are open Monday through Thursday (8:00AM to 8:00PM) with shorter hours on Fridays (8am-12pm) and Sundays (1pm-5pm). All students are welcome, and appointments are not necessary.

Students requesting a one-on-one tutor may have their requests addressed by speaking with their instructor, advisor, or counselor. Any student requesting a one-on-one tutor must complete and submit an online Student Request for Individualized Tutoring form. Additional hours beyond those listed above are available by appointment.

Students who are having difficulties are encouraged to seek assistance early. Academic success is afforded to those who recognize their academic struggles and seek help to address them early as well as throughout the semester.

The Academic Support Center looks forward to seeing students in the labs and supporting them in their educational endeavors.

Housing

On Campus:

Thaddeus Stevens College of Technology offers on-campus living arrangements in residence halls for approximately 400 students. Students who plan to live in one of the residence halls should bring their own pillows, blankets, linens, bedspreads, mattress pad, fan, and towels. Radios, televisions, and stereo systems are permitted provided they are used in consideration of roommates and other residents of the floor.

All Stevens Grant students are eligible to live on campus. After Grant students are accommodated, any additional rooms are made available on a rental basis to non-scholarship students.

Residence halls have similar amenities including laundry facilities, cable TV hook-up, two computer jacks for internet access, telephone access, and recreation rooms which contain TVs, pool tables, and in some areas, ping-pong tables. All rooms are air conditioned and have fire alarm and sprinkler systems.

Within the dorms, the College expects that students will maintain their rooms in a clean and sanitary condition for the purposes of good hygiene and appearance. Moreover, each residence hall has professional supervision, but within the governing framework, students are directly involved in the operation of their respective halls via an elected Residence Hall Council. As such, students have the opportunity to establish activities; draft policies and procedures; enhance conflict resolution and communication skills; and play an integral role in making the residence halls a wholesome living and learning environment.

Note: A student who requests housing accommodations due to a disability must complete the housing accommodations request form (which is available on the College website) and provide the appropriate documentation to the special needs coordinator for review and accommodations approval.

Off Campus:

Housing away from the campus is all privately owned and is separate and independent of the College. The College does not own, operate, or supervise these properties. Information regarding off-campus housing is available from the director of residence life.

Additional Locations

The additional locations at Thaddeus Stevens College has allowed the College to expand and provide student services in multiple areas. In addition to residential space, there is a recreation center, nursing station, and a computer/study lab available for student use. Student peer tutors are also available during posted hours for academic programs located at the additional locations.

Food Services

Jones Dining Hall

Thaddeus Stevens College has a spacious, comfortable dining hall that serves 19 meals a week. The dining hall is closed during official school recesses and during the summer, except for the summer college-level education programs from late June to early August.

Tuition students can buy meals on a cash basis or purchase a five- or seven-day meal plan.

Meal Plans

Students who purchase a meal plan will have their student ID cards activated to use in the dining hall. Thaddeus Stevens College offers two different meal plans for students who wish to eat meals on a regular basis during the regular semesters. The meal plan prices reflect the cost for one year.

Academic Year

- 5-Day\$3,260
- 7-Day\$4,120

Summer

- 5-Day\$509
- 7-Day\$641

Per Meal

- Breakfast\$ 4.60
- Lunch.....\$ 8.15
- Dinner.....\$ 8.25

(All prices are subject to change.)

Vending

Vending machines are located at convenient locations around the campus. Items include beverages and snacks.

Bulldog Café I and Bulldog Café II

At Thaddeus Stevens College, students always have the opportunity to enjoy a meal or just a quick snack from one of two Bulldog Cafés. Bulldog Café I is located on the first floor of the Schwalm Student Center on the main campus.

Bulldog Café II is located adjacent to the main lobby at the Thaddeus Stevens College on Orange Campus.

At times, hours of operation at the Bull Dog Cafés may change to better serve student needs or when conflicting with a campus-wide activity or event.

The College Store

The College Store is located at the Cence House, immediately adjacent to the main campus on East End Avenue. The store offers items that reflect the pride and colors of Thaddeus Stevens College of Technology. Some items that can be purchased are T-shirts, sweatshirts, jackets, ball caps, and sweaters. Many of the items display the logo of the Thaddeus Stevens College bulldog, the official mascot. The story of the College can also be found online at the College's website.

College Activities

Participation in campus activities and organizations is encouraged at the College. These activities are designed to enhance interpersonal skills, self-development, and interaction with others from different backgrounds. Students have the opportunity to meet other students, faculty, and staff in a friendly, relaxed atmosphere.

Special campus-wide entertainment include homecoming events, musical events, and various types of popular entertainment. Resident hall activities include pool, ping-pong, and dart tournaments, movie nights, pizza parties, dorm room decorating contests, and various holiday activities.

Cultural Activities

The College seeks to provide a genuine environment that celebrates diversity and fosters cultural support mechanisms for all students. Monthly events are planned to learn and celebrate diversity including designated events, speakers, and activities. Student groups also contribute in celebrating multiculturalism, including the Black Student Union, Young Lions support group and the Latino Scholars organization.

The Women's Center

The Women's Center offers a place of solitude for reading and doing homework; a library of feminist and women's history books; a television; a small kitchen; a forum for group discussions, meetings, and workshops; and research sources on career information and employers.

Diversity, Equity & Inclusion Committee

The purpose of this committee is to provide a positive forum through which issues of diversity, cultural sensitivity, and human relations are recognized, understood, and observed by all members of the Thaddeus Stevens College community.

The Committee works with various constituencies and organizations on campus to promote communication, equity, and acceptance of diverse groups. The Committee identifies and coordinates educational and training opportunities for students and staff. The Committee provides a confidential forum for individuals to discuss concerns that may be of a discriminatory nature and serves as a recommending body with respect to diversity issues in specific cases or for the

campus community in general. Committee membership is drawn from all groups representing the College community.

Athletics

Intercollegiate Athletics

Thaddeus Stevens College of Technology maintains an athletic program of five major intercollegiate sports: football, cross-country, basketball, wrestling, and track and field. Contests are scheduled against college and university junior varsity teams and junior and community colleges in the mid-Atlantic states. The basketball, cross-country, wrestling, and track and field programs are presently affiliated with the National Junior College Athletic Association. These affiliations allow the College's athletes to compete in regional and national competition when qualifying standards are met. The football squad in the Seaboard Conference.

Intramural Athletics

Thaddeus Stevens College of Technology offers a schedule of intramural activities in individual and team sports. The Intramural Committee is comprised of student representatives from each vocational/technical area who organize these activities. Included in the individual activities are a three-point shooting contest and slam-dunk contest. Team-oriented sports include volleyball, basketball, racquetball, and dodgeball.

Student Center

The Schwalm Student Center is one of the focal points of student activity on the main campus. Completely renovated by Thaddeus Stevens College students, the center boasts three floors, offering some of the following attractions: TVs, snack machines, surround-sound stereo, pool tables, foosball, snack area with microwaves, drink machines, lounge/study areas, Bulldog Cafe I, and private offices for student-led activities. The café is open Monday through Friday from 8pm to midnight.

Multipurpose Activity Center (MAC)

The 61,000-square foot Multipurpose Activity Center features a spacious gymnasium with a primary basketball arena, flanked by courts on either side. Two racquetball courts, an elevated 110-meter track, several coaching offices, a training center, extensive locker room facilities, and seating for approximately 2,000 highlight the center. The MAC also includes a state-of-the-art cardio area and an extensive array of free weights and a separate circuit training area, composed of numerous pin-loaded machines.

Student Organization Policy

Thaddeus Stevens College strongly supports student organizations that will contribute meaningful experiences for students to enhance their cultural, social, physical, and spiritual development. Such organizations shall be open to all members of the student body. They shall devise rules that will encourage participation of all interested students without requirements that might exclude any member of the student body. The Student Congress shall review and recommend such organizations. The director of student services shall assist formalization of these organizations.

Student Organizations

American Design Drafting Association (ADDA)

This student chapter of the ADDA shall operate in accordance with the Articles on Student Chapter Activities as set forth

in the ADDA Constitution and By-Laws. The purpose of this chapter shall be to disseminate technical information for improving the science of graphic communications and design, to initiate and encourage a continued program of education so as to provide self-improvement and progress through increased knowledge, and to foster a spirit of fellowship among its members.

American Institute of Architectural Students (AIAS)

Promotes excellence in architectural technology, training, and practice while advancing the science of architectural technology. Encourages comradeship, cooperation, and unity.

Black Student Union (BSU)

This chapter of the National BSU is a resource for all students who wish to learn and explore minority cultures, and gives voice and preparation to students who may face future challenges because of their race or socioeconomic status.

Boxing Club

An opportunity to get an excellent cardio workout. Open to anyone who wishes to learn boxing techniques.

Latino Scholars Alliance

A representative body of students of Hispanic origin, Latino Scholars Alliance is charged with the authority to provide a supportive social and academic network of peers. The organization celebrates the diverse cultures and heritages of Hispanic origin, and membership is open to the entire College community.

Outdoors Club

For students interested in the great outdoors—everything from archery to turkey calling.

Phi Theta Kappa

Invitation to join the Beta Nu Delta Chapter honor society is extended to full-time students maintaining a grade point average of 3.5 or higher. Personal enrichment is gained through the organization's four hallmarks of scholarship, leadership, service and fellowship.

Power Source

Students meet on a regular basis to fellowship and share faith-based experiences.

Residence Hall Council

A representative body of students initiating and carrying out relevant policies concerning residence life for each residence hall.

Society of Manufacturing Engineers (SME), Chapter S228

First-hand experiences linking theory and application with industry needs.

Student Congress

A representative body voicing student opinions concerning cultural and academic life and sharing proportionately in the development of College policy.

SkillsUSA

An enjoyable competition with students from other colleges who study in the same technical area.

Spectrum

Alliance: Building an alliance of understanding and support of LGBTQ+ students and the campus community at the College.

Tech Phi Tech

Fraternity founded in 1986 to encourage and sponsor development of collegiate activities, community service, and scholarship.

Women in Tech and Trades

A blend of social and educational activities provided for women on campus. The club sponsors monthly group discussions on various issues of particular interest for women students.

Campus Publications

The Student Handbook provides information on campus life, institutional policies, procedures, regulations, and student services.

The Campus Bulletin is a regular newsletter emailed to faculty, staff, and students to keep them informed of activities, announcements, and sporting events on campus. The bulletin is posted on the intranet and Internet regularly.

Annual Crime Statistics provides information pertinent to campus security information and crime statistics at the College, in accordance with the Student Right-to-Know and Campus Security Act.

Parking Regulations provides information on the registration of vehicles, parking regulations, and payment of fines.

The Stevensonian is the College's annual yearbook.

Student Government

Participation in student government affords students the opportunity to acquire leadership skills while contributing to the welfare of the Thaddeus Stevens College community. The following represent possibilities for student leadership:

Student Congress

Student Congress members are elected each fall to express student opinions on campus social, cultural, and academic life. Student Congress prepares proposals and submits them to the director of student services. This student organization also serves as a means of communication between students, faculty, and administration.

Residence Hall Councils

Residents of each individual residence hall elect a council that is responsible for the initiation and execution of policies governing life in that particular residence hall. The Residence Hall Councils serve as a means of communication between students, residence hall personnel, and administration. Each council plays an important role in establishing activities for residents.

Members of the councils meet as the Joint Residence Hall Council to discuss common issues. All residence halls are responsible for hosting such a meeting at least once during the fall and spring semesters.

Drug-Free Schools and Communities Act

In support of the national strategy to combat illegal drug and alcohol abuse, Congress has enacted the Drug-Free Workplace and the Drug-Free Schools and Communities Act Amendments, which require that "as a condition of receiving

funds or any other form of financial assistance under any federal program, an institution of higher education or state/local educational agency must certify that it has adopted and implemented a program to prevent the unlawful manufacture, possession, use, or distribution of illicit drugs and alcohol by students and employees." Thaddeus Stevens College of Technology has issued the following statement to inform the community of the seriousness of the use and abuse of drugs and alcohol and to set forth the standards of conduct regarding such activity by students and employees of the institution.

Community Responsibility

Thaddeus Stevens College of Technology students and employees are both citizens and members of the academic community. As citizens, they enjoy the same rights and obligations that all other citizens enjoy; and, as members of the academic community, they are subject to the rights and obligations that accrue to them by virtue of this membership. Students and employees are expected to be honorable and ethical in every regard and to have consideration for the welfare of others as individuals and for the community as a whole.

Standards of Conduct

The unlawful manufacture, possession, use, misuse, abuse, or distribution of illegal drugs, alcohol, and illegal prescription drugs without authorization and medical supervision on institutional property or off campus while conducting any officially sanctioned institutional activity is strictly prohibited. If found in violation of these standards, students and employees will be subject to severe disciplinary action and may incur penalties prescribed by civil authorities. Faculty and staff, as a condition of employment, must abide by the terms of this policy and report any convictions under criminal drug statutes for violations occurring on or off the premises while conducting business for the institution within five days of the conviction.

Sanctions for violation of any of the aforementioned standards imposed on employees may vary from mandatory participation in rehabilitation programs to termination of employment and referral for prosecution.

For students, sanctions imposed by the institution for violations of the above conditions may range from probation up to and including expulsion and referral for criminal prosecution.

Definition of Illicit Drugs and Alcohol

Illicit drugs refer to certain controlled substances not prescribed by the user's physician, including (but not limited to): marijuana (including hashish); stimulants (amphetamines, cocaine); depressants; hallucinogens (including PCP); opiates or narcotics (heroin, morphine, opium); inhalants (sprays, solvents, glue); and designer drugs (synthetic drugs similar in effect to stimulants, hallucinogens, and narcotics, including GHB and Ecstasy). This list is not comprehensive.

In addition to illicit drugs, illegal prescription drugs that are used without authorization and medical supervision can also pose a serious threat to both the physical and mental well-being of the user.

Alcohol is a depressant that slows the activity of the central nervous system and the brain. Alcohol is a substance regulated by local, state, and federal agencies with respect to its purchase, transportation, consumption, and possession.

Health Risks

All drugs, including alcohol, can produce serious side effects. This is true even of prescription or other legal drugs when used as prescribed, but their risks are weighed against their benefits by medical professionals in the therapeutic context. Prescription drugs used without a prescription and medical supervision can pose a serious threat to the well-being of the user. Because the drugs listed below impair the mind, they increase likelihood of accidents and violent behavior. The many health risks associated with alcohol use are well documented. Small amounts may affect judgment and coordination, impairing performance of even simple routine tasks. The repeated use of alcohol can lead to dependence, with multiple physical, emotional, and psychological complications. Effects of the prolonged use of alcohol may include damage to the central nervous system; malnutrition and anemia; damage to the heart, lungs, and liver; mental disorders; and death.

Health risks associated with the seven categories of illicit drugs may include the following:

- Marijuana: impaired memory, lung and pulmonary damage, chronic emphysema, cancer
- Stimulants: paranoia, hallucinations, dizziness, headaches, abdominal cramps, malnutrition, overstimulation of the central nervous system, seizures, stroke, heart failure, death
- Depressants: initial effects similar to alcohol inebriation, slowed reflexes, unstable mood, loss of memory, coma, death
- Hallucinogens: distortion of reality, including illusions and hallucinations, injury of self or others, convulsions, brain damage, coma, death
- Opiates (narcotics): skin abscesses, respiratory damage, malnutrition, pneumonia, hepatitis, heart disease, diabetes, coma, death
- Inhalants: fatigue, weight loss, permanent damage to the nervous system, hepatitis, organ failure
- Designer drugs: psychosis, instant paralysis and brain damage, death

In addition, “date-rape” drugs Rohypnol and GHB may cause a weakened or unconscious state often followed by amnesia.

Drug and alcohol abuse can reduce the body’s resistance to infections and bring about malnutrition, organ damage, and mental illness. Overdoses of almost all these substances can cause psychosis, convulsions, coma, and death.

Legal Sanctions

In Pennsylvania, the purchase, consumption, transportation, or possession of alcoholic beverages by a person younger than 21 is punishable by a loss of driving privileges and fines of up to \$300 for the first offense and up to \$500 for subsequent offenses. (18 Pa.C.S.A. § 6308; 18 Pa.C.S.A. § 6310.4.) Misrepresentation of age to procure or furnish

alcoholic beverages for oneself is a summary offense punishable by a fine of up to \$300 for a first offense and is a misdemeanor punishable by a fine of up to \$500 for a subsequent offense. All such violations are also punishable by a loss of driving privileges. (18 Pa.C.S.A. § 6307.) Misrepresentation of the age of another for the purpose of procuring alcoholic beverages for that person is a misdemeanor punishable by a fine of not less than \$300. (18 Pa.C.S.A. § 6309.) The intentional and knowing sale or furnishing of alcoholic beverages to a person less than 21 years of age is a misdemeanor punishable by a fine of not less than \$1,000 for a first offense and \$2500 for subsequent offenses. (18 Pa.C.S.A. § 6310.1.) Manufacturing, making, altering, selling, or attempting to sell a false identification card is a misdemeanor punishable by a fine of not less than \$1,000 for a first offense and not less than \$2500 for subsequent offenses. (18 Pa.C.S.A. § 6310.2.)

The penalties for the unlawful possession, use, or distribution of illicit drugs are more diverse than those governing underage drinking and vary depending upon the nature of the drug involved and the nature of the activity. For example, unlawful possession of 30 grams or less of marijuana or eight grams or less of hashish, for example, is a misdemeanor punishable by a term of imprisonment of up to 30 days and a fine of up to \$500 or both. (35 P.S. §780-113[a][31] and [g].)

At the other end of the scale, the manufacture, delivery, or possession with intent to manufacture or deliver heroin or other narcotics is a felony carrying a penalty punishable by a term of imprisonment of up to 15 years or a fine of up to \$250,000 or both. (75 P.S. § 780-104; 35 P.S. §780-113[a][30] and [f][1].) A complete summary of penalties related to unlawful possession, use, or distribution of alcohol or illicit drugs can be found in the Campus Safety Office. Individuals seeking advice regarding drug or alcohol-related laws should consult legal counsel.

Title IX and Sexual Harassment Policy

Section 1604 of Title VII of the Civil Rights Act of 1964, Title IX of the Educational Amendments of 1972, and the Pennsylvania Human Relations Act defines sexual harassment in the following manner:

- Sexual harassment involves unwelcome sexual advances or requests for sexual favors and other verbal or physical conduct of a sexual nature constitutes sexual harassment when:
- Submission to such conduct is made either explicitly or implicitly, a term or condition of an individual’s employment or education.
- Submission to, or rejection of, such conduct by an individual is used as the basis for an employment or academic decision affecting such individual.

Such conduct has the purpose of affecting or unreasonably interfering with the individual’s work or academic performance, or creating an intimidating, hostile, or offensive working, educational, or living environment.

Thaddeus Stevens College of Technology prohibits sexual harassment of its students and employees from any source, including students, employees, visitors, and consultants.

Sexual Assault Policy

Sexual assault includes any of the following:

- a) Any intentional, unconsented touching, or threat or attempt thereof, of:
 - (i) An intimate body part of another person, such as a sexual organ, buttocks, or breast
 - (ii) Any body part of another person with a sexual organ
 - (iii) Any part of another person's body with the intent of accomplishing a sexual act
- b) Forcing, or attempting to force, any other person to engage in sexual activity of any kind without her or his consent.

Sexual assault is defined and prosecuted as a federal felony offense. Discipline by Thaddeus Stevens College of Technology does not take the place of, or prevent further prosecution by law enforcement agencies.

Our College prohibits domestic violence, dating violence, sexual assault, and stalking.

For reporting possible relationship abuse or sexual assault:

1. Get to a safe place! Do not bathe, shower, nor change clothes.
2. You may contact a campus resource:
Campus Security: 286-4607; 606-1564
Title IX Coordinator, Betty Tompos: 391-6947
Nurse's Office: 391-3561; 606-1541 (Confidential Resource)
School Counselor, Deb Schuch: 299-7408 (Confidential Resource)
3. You can also contact confidentially, off-campus, the Lancaster Domestic Violence Center Hotline at 299-11240/299-1249, or the Pennsylvania Coalition against Rape (PCAR) local Sexual Assault and Counseling Center Hotline at (800) 392-7273.

*You may also contact the U.S. Department of Education, Office for Civil Rights, at (800) 421-3481 or ocr@ed.gov.

Vehicle Policy

All student-operated vehicles are to be registered with the institution within 48 hours of being brought on campus. Parking permits are available from the College's Business Office for an annual fee of \$15. The parking permit fee is nonrefundable. (See Student Handbook and/or Parking Manual for additional information.)

Shuttle Services

The shuttle van is available Monday through Friday for transportation between the Thaddeus Stevens College on Orange Campus and the main campus from 6:30 am to 8:00 pm.

Weekends: Students should contact security to obtain a cab ride from campus to campus if needed.

Weapons Policy

Any student found in possession of a weapon will be subject to disciplinary action ranging from suspension to expulsion. (See Student Handbook for further details and definitions.)

Rights of Privacy and Access for Students

College policy safeguards the rights of privacy and access regarding students' educational records as stipulated in the

Buckley Amendment (Family Educational Rights and Privacy Act of 1974). Generally, information is not released without the written consent of the student.

The following are released for what is deemed as directory information: Student's name; address; telephone number; date and place of birth; major field of study; participation in officially recognized activities and sports; weight and height of members of the teams; dates of attendance; degrees and awards received; and other similar information.

See other information on the Privacy Act in the Student Handbook. Students who wish to restrict the release of this information must fill out the appropriate form, available in the Office of Financial Aid and Registration.

Orientation

An orientation program, scheduled for new students prior to the start of each fall semester, is designed to answer questions and to help students adjust to the college environment. Students participate in short seminars such as success strategies, diversity, and conflict resolution. Informational sessions are held in the areas of student employment, resident life, campus activities and organizations, general rules and regulations, as well as tutorial, counseling, and other related services.

Health Services

Medical personnel are on duty at the College's Health Office on the first floor of Brenner Hall from 7:30 am until 5:00 pm, Monday through Friday. This service is available to all students. There is no fee for health office services. Serious medical situations are referred to the Lancaster General Hospital or other appropriate agencies. Students are responsible for medical costs incurred at an outside clinic, physician's office, or hospital.

Insurance

The College does not provide health insurance. Students are encouraged to provide their own medical/surgical hospitalization insurance. If not covered by a family policy, the student should purchase an individual policy or participate in a medical assistance program.

Important Note: The College cannot be held liable for medical costs incurred as a result of injury or illness.

Student Right-to-Know Campus Security Act

In accordance with the Student Right-to-Know and Campus Security Act, the institution is required to make readily available information regarding graduation rates and campus safety policies and procedures. Graduation information is obtainable from the director of assessments and accountability, while campus safety information is filed in the Campus Safety Office, the Office of the Vice President for Finance and Administration, and the Office of Student Services. A log of all reported crimes with the names and addresses of those who have been charged in those incidents is available in the Business Office during normal working hours.

Academic Information



Academic Support Services

In the transition from home to college, students may need to discuss their concerns. A variety of resource personnel are available to provide support and guidance to students.

Academic Center

The College Academic Center, located on the 3rd Floor of the Learning Resources Center (LRC), provides students with a location to obtain educational advice and academic assistance. Academic Coaches are available to assist with organization, time management, study skills, note taking, math and more. Students are encouraged to use the Academic Center to study individually, work on group projects, study in groups and utilize computers. Comfortable seating, microwaves and coffee are available for study breaks.

Professional and peer tutors staff the English and Math Labs which are located at the front entrance of the LRC. The labs are open on a walk-in basis Monday through Thursday (8:00AM to 8:00PM) with shorter hours on Fridays (8am-12pm) and Sundays (1pm-5pm). Students are strongly encouraged to make regular use of the labs to complete assignments and prepare for tests.

Peer tutors are available to provide assistance with technical program courses. Some peer tutors assist during class while others hold after-class hours in the program area or in the Academic Center. Peer Tutor schedules are emailed and posted online at the start of each semester.

Act 101

The College participates in Pennsylvania Higher Education Assistance Agency's Act 101 program, a statewide initiative established in 1971 to ensure that residents of the Commonwealth enjoy equal opportunity to pursue higher education. Act 101 students are identified based on specific educational and economic criteria set forth by the Commonwealth of Pennsylvania. Act 101 staff closely monitors student progress and provides academic, career, and personal counseling designed to facilitate collegiate success. Staff also refer students for peer and professional tutorial support to assist students in mastering academic and technical skills required of their programs. The Act 101 program has been promoting student success at Thaddeus Stevens College since 1976.

Academic Advisors

Each student is assigned an academic advisor. Academic advisement is a vital element of support provided to students by the College's general education faculty. Regular meetings with advisees ensure that students fully understand program requirements, make appropriate course selections, and follow prescribed registration procedures. The advisor/student relationship provides a means for students to seek assistance with both program-related issues and personal matters. The goal is to serve the total student as well as advise students in academic matters. Academic advisors are available during posted office hours and by appointment.

Assessments

Student participation, performance, and evaluation have been and will continue to be a critical element in assuring the College continues to meet the accreditation standards for accreditation and safeguarding a student's opportunity to apply for loans and grants issued by the federal government. For these reasons, students of Thaddeus Stevens College of

Technology are required to participate in critical assessments and evaluations such as but not limited to those listed below:

- National Occupational Competencies Institute Assessment (NOCTI): Technical program pre-test measures technical competencies of students newly enrolled.
- National Occupational Competencies Institute Assessment (NOCTI): Technical program post-test measures technical competencies of students completing a program illustrating academic growth overtime.
- Automotive Service Excellence Student Certification (ASE): A series of pre-test exams that measure technical competencies of students newly enrolled in Automotive and Collision Repair Technology programs.
- Automotive Service Excellence Student Certification (ASE): A series of post-test exams that evaluate and certify competencies as a service professional in the Automotive and Collision Repair Technology programs.
- ETS Proficiency Profile Assessment: Pre-test measures academic competencies in reading, writing, mathematics, critical thinking, humanities, social sciences, and natural sciences of students who are newly enrolled.
- ETS Proficiency Profile Assessment: Post-test measures academic competencies in reading, writing, mathematics, critical thinking, humanities, social sciences, and natural sciences of students completing a program illustrating academic growth overtime.
- Student Academic Opinion Survey (SAOS): Online survey provides instructors with critical feedback regarding the classes they teach. Identity of respondents is confidential. Graduate Online Survey: Post-graduate survey provides the College with vital information regarding career placement and starting salary. Post-graduate surveys are conducted 1 year, 5 years, and 10 years after graduation.

Career Services

Thaddeus Stevens College of Technology provides free placement assistance service as administered by the Director of Career Services. The median five-year placement rate of graduates of Thaddeus Stevens College is over 90%. Placement rate is defined as the percent of graduates who are either working full-time in a field related to their major or continuing their education on a full-time basis. Many programs have a 100% placement rate. Students seeking full-time employment upon graduation or internships during college should see a member of the Career Services staff in room 106 of the Hartzell Building and/or visit the My Career Services page of the portal located under the "Student Services" tab.

Career Fair

The College hosts annual career/job fairs in the MAC Building each February. Students are given the opportunity to meet and network with hundreds of employers from across Pennsylvania that have employment vacancies for full-time positions for graduating sophomores and summer internships for freshmen.

Job Placement

Throughout the year, job vacancies are posted via the College's job-posting website, College Central Network, one of the most comprehensive online recruitment services on

the Internet. CCN provides a direct connection to full-time, part-time, internship, seasonal, freelance, and volunteer opportunities. All of CCN's services are free of charge to students and alumni of Thaddeus Stevens College of Technology. To register, visit www.collegecentral.com/stevens today.

Seminars/Workshops

Seminars and workshops are offered during the academic year to assist students with résumé writing, cover letters, interviewing skills, mock interviews, soft skills, internship prep, and self-branding/social media.

Internships

Designed for second-year students and typically done during the summer between a student's first and second year, an internship is an approved educational program that provides students with academic credits for work done in their field of study. Students are required to have completed a minimum of 12 credits in their program major and have earned a 2.5 GPA or higher to participate. Internships are available on and off campus throughout the year. Information regarding internships may be obtained by visiting the Career Services Office in the Hartzell Building.

College Transfer

The Career Services Office assists students who are interested in transferring to a 4-year college or university after graduation from Thaddeus Stevens College of Technology. The College has a number of articulation agreements with other colleges/universities throughout Pennsylvania. Information regarding transferring to another institution can be obtained by visiting the Career Services Office in the Hartzell Building.

Counseling

Professional counselors are available at Thaddeus Stevens on Main, and Thaddeus Stevens on Orange. Counselors travel to all program locations, and respond to students via phone, email and zoom if needed. Counselors are available weekdays and some evenings. Counselors provide mental health, social and academic counseling emphasizing wellness and coping strategies to benefit the student in college, at work and in life. Counselors provide brief counseling in a confidential setting, examples which include depression and suicidal thoughts, anxiety, social anxiety, stress, family and relationship difficulties, poor focus, distractibility, disorganization, and struggles with managing medical, physical and mental illness. When appropriate, counselors may refer students to community-based providers. .

Mentoring

As part of the college's network of student support, the overarching concept of our mentoring program at Thaddeus Stevens College of Technology provides students with an opportunity to connect with other students, faculty, and industry representatives in a more in-depth, safe way to enhance the college experience and drastically increase the retention and academic success of our students.

The mentoring programs below have one common outcome: To improve recruiting, retention, and graduation rates. They are designed to work independently, but in concert with each

other maximizing contacts to benefit student success, and all use common models, processes, and information sharing for coordination and synergy.

1. Peer Mentoring (group mentoring)

The peer mentoring program is designed to provide students with a smooth transition from one academic year to the next. Utilizing academically successful freshman and sophomore students, mentored, students are made to feel included, more comfortable, and have a better understanding of what to expect during their academic journey. Peer mentors are accessible by other students via email, cell phone, and campus activities/events.

Premajor mentors: Freshman students who have successfully completed the Premajor program and are now in the freshman year of their technical program major are selected to mentor incoming Premajor students. Pre-major mentors are coordinated through the Academic Success office.

2. Industry Mentoring (group mentoring)

The industry mentor program provides another outlet for students to connect with a professional in their field of study; someone to encourage and push them to see the correlation between success in the classroom and success out in industry thus increasing retention of those students who may be on the cusp. Via shop visits, virtual connection (Skype, Google, email correspondence), mock interviews, industry mentors will be a bridge from the classroom to the real world answering questions students have about expectations in industry and providing a link to other industry leaders for job shadows, internships, further education/apprenticeships. Industry mentors are coordinated through the Career Services Office.

3. Women's Mentoring (one-on-one mentoring)

Women's mentors are coordinated through the Women's Center.

4. NSF Grant Specialized Mentoring (group mentoring)

The NSF/ATE grant seeks to improve retention by increasing female students' sense of belonging in STEM and at Thaddeus Stevens College through informal group mentoring discussions utilizing female industry role models. This mentoring is open to all students of Thaddeus Stevens College. NSF Grant mentors are coordinated through the NSF Grant administrators.

Residential Hall Staff

Professional residential hall advisors assigned to residence halls on the main and Thaddeus Stevens College on Orange campuses. All of these advisors, as well as the director of residence life, are trained in dealing with residence hall issues, certified in adult CPR, as well as in the use of an automated external defibrillator (AED). All issues concerning residence life or housing will be dealt with by this staff under the direction of the director of residence life. Counseling issues, as needed, are referred to the professional counseling services available on campus.

Accessibility Services

In accordance with the Americans with Disabilities Act, Amendment Act of 2008. Section 504, Section 508 of the Rehabilitation ACT of 1973, The Counseling/Accessibility

office of Thaddeus Stevens College of Technology supports students with disabilities to understand the essential academic, social and emotional skills needed to graduate, obtain and maintain employment.

Students who qualify for admission to the college are eligible for accommodations after they have disclosed, by providing documentation of a disability.

Documentation is reviewed by the Counseling/Accessibilities Coordinator, and accommodations are approved if they do not alter the pace, content or essential skills required for each course and program. Some accommodations may be available through Universal Design practices or technology.

Disability information is protected under laws such as FERPA and HIPPA; which limits the sharing of information to only individuals who have a specific need to know, and to those individuals whom the student has designated through a signed release.

Disclosure: The student and not an individual acting on behalf of the student must disclose. The student may disclose at any time, however, accommodations are not retroactive. Documentation must be current, define the disability, show evidence of affecting a major life activity, and cite accommodations that relate directly to the disability. Documentation must be from a licensed professional, such as a psychologist, or treating physician. The most recent IEP, Evaluation Report from the student's high school should be from the junior or senior year. In general documentation should not be older than 3 years.

If a student is receiving services provided by a community based provider while the student is enrolled these are considered accommodations, and must be coordinated through the Counseling/Accessibility Office to assure continuity, and appropriate levels of intervention. Disclosure should occur as early as possible, preferably during the admissions process and prior to enrollment. Disclosure and an interview with the Counseling/Accessibility Coordinator is required of all students prior to implementing accommodations.

Documentation provided by applicants who are not admitted will be maintained for only one academic year. For further information contact Ms. Schuch, at schuch@stevenscollege.edu or review information available at www.stevenscollege.edu under Counseling/Accessibility tab.

Accommodations Implementation

Any questions regarding the approval or implementation of accommodations should be discussed with the Accessibilities Coordinator. Any issues will be resolved through discussion among the instructor, Accessibilities Coordinator, student, and if necessary the Vice President of Academic Affairs. The student is responsible for meeting with the Counseling/Accessibility Coordinator at the beginning of each semester, and following through with communication related to accommodations. The student will inform instructors and others with a need to know by providing them with a signed copy of the Approved Accommodations Form. Accommodations may not be provided to the student if the instructor has not received this form. Accommodations and Support Services may be provided by various individuals on campus, the student's signature on the Accommodations

Form indicates his or her understanding of procedures to obtain accommodations, and acknowledges permission to share information with members of the Retention Team.

Challenge of Approved Accommodations:

If a student disagrees with the Accessibilities Coordinator's determination, the student has the right to have the decision reviewed. At this point, the student recognizes and agrees to permit information related to his/her disability to be shared with faculty, staff, administrators, and legal counsel to determine appropriate action.

Steps to Challenge:

- 1) Student informs Accessibilities Coordinator in writing of request for review.
- 2) Student submits a Written Request to the Dean of Student Services or the VP of Academic Affairs for a review of the situation.
- 3) The administrators review the decision made by the Accessibilities Coordinator, and the student's concerns to determine if the student's request is denied or approved. A written decision is provided to the student, and a copy placed in the student's file in the Accessibility Office. The Approved Accommodations Form is updated if warranted and redistributed to any other individuals involved in providing accommodations to the student.

Provision of Approved Accommodations-

If a student believes that the accommodations she/he has been approved to receive by the

College are not being provided or being provided in a manner inconsistent with what was approved, the student should take the following steps:

- 1) Student should request a meeting with the individual, who is responsible for providing the accommodation to discuss the student's accommodations needs.
- 2) Student should schedule a meeting with the Accessibility Coordinator to discuss his or her issues and/or concerns.
- 3) If the situation is not resolved then the student should request a meeting with the VP of Academic Affairs or Dean of Student Services as described above.

Employment

On Campus

Students are employed by the College each year to work in the library, residence halls, intramural programs, athletic programs, student tutors, and throughout the campus. Student positions sometimes require up to 20 hours of work per week. Job applications are available through the Office of Student Services. (Students are paid at the current minimum wage.)

Off Campus

Local companies call the College during the scholastic year in search of evening and weekend workers. These positions, some of which require specialized technical skills, are advertised by the Career Services office, Room 106 of the Hartzell Building. Openings are posted via College Central Network, the college's on-line job posting website.

Computer Labs

Many computer labs are found on campus, most of which are dedicated to a specific technical area. A general computer

lab, located in the lower level of the Learning Resources Center, serves the campus for computer classes, general assignments, email functions, and Internet research and exploration. This lab is available to students at various times during the day and in the evenings until 10 pm.

Classification of Students

Full-Time

A full-time student must maintain at least 12 credits during a semester. Exceptions require the approval of the vice president for academic affairs.

Part-Time

Part-time students are those who are registered for fewer than 12 credits. The College will accept part-time, tuition-paying, nonresident students into general education, technical, and evening courses, provided that vacancies exist in a particular area. The tuition rate is by credit hour. Further information is available in the Office of Financial Aid and Registration.

Credit Value and Course Numbers

The Semester Hour

The credit value of courses is expressed in semester hours. Lecture courses are designed to require approximately the same number of hours of class time per week as the semester hours of credits they are assigned. Laboratory based courses are designed to require three times the number of hours of lab time per week as the semester hours of credits they are assigned. A course that combines lecture and lab components requires a mix of these requirements based upon their distribution of semester hours of credit between lecture and lab. In addition, students are expected to complete a minimum of two hours of "out-of-class" time for each week with every credit of instruction.

Course Numbers

Each course taught at the College is identified by a code of letters and numbers (e.g. WELD 125). The letters are an abbreviation for the program within which they are found. The three-digit numbers indicate the semester in which the student would enroll during their studies. Courses numbered 100 through 149 are usually taken in the first semester; courses numbered 150 through 199 are usually taken in the second semester; courses numbered 200 through 249 are usually taken in the third semester; and courses numbered 250 through 299 are usually taken in the fourth semester.

General Education Requirements

General education courses are required of all majors at Thaddeus Stevens College of Technology. These courses support academic work within the major, enhance employment skills, and help prepare students for full, effective lives as citizens.

Students are required to successfully complete a total of 25 general education credits for graduation. General education courses include the liberal arts and science core and general education applied courses.

Liberal Arts and Science Core

These courses emphasize theoretical concepts, critical and analytical thinking skills, and numerical and verbal literacy. Students are required to successfully complete at least 18 credits from the liberal arts and science core.

These 18 credits must include 1 course from each of the following 4 core areas:

- Mathematics (MATH)
- English (ENG)
- Science (includes PHYS, BIO, etc.)
- Humanities (includes all SOC, ECON, HIST)

General Education Applied Courses

These courses emphasize practical application of skills are general in scope and content (non-major specific), support student employability, academic achievement, and student personal development.

Courses include:

- Business (BUSN)
- Computer Information Systems (CIS)
- Health (HEAL)

Students may apply up to 7 general education applied course credits to graduation requirements.

Scheduling/Registration

Because of the number of students who normally register for classes, on-time registration is encouraged. Specific days/times are established for this process. The sophomore class has priority in signing up for general education classes. Students may obtain copies of the model schedule from their academic advisors.

Course Selection and Graduation Requirements

Students are responsible for fulfilling their graduation requirements, whether general education or technical. Academic advisors assist students in planning course selections, but the final responsibility for meeting graduation requirements rests with each student.

With an academic advisor's help, students should schedule and register for the required general education courses listed on their model schedules. Departures from these requirements are only acceptable if approved by the academic advisor and the vice president for academic affairs.

Academic Year/Semesters

The academic year is divided into two sessions of 16 weeks: a fall and a spring semester. Summer sessions may be held from May through August for pre-major and program courses.

Finals Week

Although finals are administrated in most technical and general education courses during the last week of the semester, the regular class schedule is followed. A special final exam timetable is not instituted. Students with questions about their finals or special final projects should discuss them with the instructor of the class during the semester.

Academic Overload

The normal credit hour load is 19 credit hours per semester. Students who wish to enroll for more than 19 credit hours should complete the course overload request form available in the Office of Financial Aid and Registration. Students who wish to schedule an overload must have the permission of their academic advisor and the vice president for academic affairs.

Change of Schedule

After a student is officially registered, changes to the schedule may be made through the official policy of adding and/or dropping a course.

Drop/Add and Withdrawal Policies

Students may drop, add, or withdraw from courses in accordance with the procedures. Students must recognize that dropping, adding, or withdrawing from courses may have serious consequences.

These consequences may include the following:

- Loss of grants (e.g., Federal Pell Grants)
- Loss of full-time student status
- Loss of credit for courses
- Inability to graduate

Students may not be able to make up courses at the College (especially technical courses) unless during the semester that the course is offered. Students must obtain all required signatures on an official drop/add or withdrawal form and turn in the appropriate form to the Office of Financial Aid and Registration by the published deadline. A student who leaves the College without completing and turning in the form may receive failing grades. A student must take a minimum of 12 credits each semester to maintain full-time status.

Options for adding, dropping, or withdrawing are the following:

- A student may add or drop any technical course during the first two days of the semester.
- A student may add or drop any general education course during only the first week of the semester. Grading Policy



Each academic year is divided into two semesters. At the end of each course, instructors submit one grade per course to the Office of Financial Aid and Registration for each of their students. All scholastic information is recorded on the student's transcript, and a grade report for the semester is sent to the student. To protect the confidentiality of a student's record and in compliance with federal law, no grades are given over the phone.

All grades listed below are recorded on the student's transcript. (A grade of "W" will be given if the student withdraws from the course before the assigned deadline.)

Occasionally an "I" grade is reported if circumstances warrant to denote a grade of "Incomplete." If the student receives an "I" grade, it will not be calculated in the grade point average (GPA). In the event that the student does not complete the work by the fourth week of the following semester, the "I" grade will be changed to an "F" grade unless an alternative arrangement is made with the approval of the instructor and the vice president for academic affairs.

Grade Point Average

The grade point average (GPA), which appears on the student's grade report at the end of the semester, is based only on semester grades. The grade point average is computed by the following:

Multiply the number of credits per course by the quality point allocation (QPA). See the adjacent table.

Divide the total number of quality points earned for the semester by the total number of credits attempted for the semester to determine the grade point average.

Grade	QPA		Grade	QPA	
A	4	93+	C-	1.7	70-72
A-	3.7	90-92	D+	1.3	67-69
B+	3.3	87-89	D	1	63-66
B	3	83-86	D-	0.7	60-62
B-	2.7	80-82	F	0	0-59
C+	2.3	77-79	I	0 (Incomplete)	
C	2	73-76	W	0 (Withdrawal)	

Dean's List

A full-time student with a GPA of 3.25 or above (and no incomplete grades) is placed on the Dean's List at the end of the semester.

Honors

At graduation, the following distinctions are given:

- 3.25 to 3.34: Honors
- 3.35 to 3.64: Cum Laude
- 3.65 to 3.94: Magna cum Laude
- 3.95 to 4.0: Summa cum Laude

Incomplete Grades

If, for reasons beyond a student's control, he/she is unable to complete a course within the prescribed time, the grade for that course may be deferred with the approval of the instructor and the vice president for academic affairs. An "I" would appear on the transcript and would not be calculated.

in the student's GPA. The required work would have to be completed by the end of the fourth week of the following semester.

This option is not to be used to delay inevitable failing grades. To request an incomplete grade, students must obtain a form from their academic advisor and then request the instructor's approval. If approved, the instructor must then submit the completed form to the vice president for academic affairs for approval and signature. All approvals must be completed before the end of the semester.

In the event an "I" grade is not removed by the fourth week of the following semester, the grade is changed to an "F" unless an alternative arrangement is made with the approval of the instructor and the vice president for academic affairs.

Grade Report

Throughout the term, it is now policy at Thaddeus Stevens that all teachers must regularly update grades in the My Stevens College portal. Individual teacher policy, which is located on the syllabus, will define how often teachers will update simple and complex assignments, but students will always have access to their progress in this way.

By the fifth week of the semester, instructors identify for the Vice President for Academic Affairs those students who are in poor academic standing and could possibly fail. A series of steps are then taken by the instructors, academic advisors, and counselors to prescribe actions to alleviate the students' problems in the courses.

Final semester grades are available on the college portal after the end of the marking period. The grade report shows all coursework completed by the student. To protect the confidentiality of a student's record and in compliance with federal law, no grades are given over the phone. The complete procedure for appealing a grade can be found in the Student Handbook.

Course Repeat and Program Acceptance Policy

Students may repeat a course to earn a higher or passing grade. Only the highest grade earned will be used in the GPA calculation.

Definition: The term "repeat" is applied when a student retakes a course that the previously were awarded a grade, including a "W." The first time a student completes a course for a grade is considered the first attempt. The second time a student completes a course for a grade it is considered the second attempt and the first repeat.

Developmental Courses

Students who are required to successfully complete developmental coursework prior to enrolling in their desired major will be given the opportunity to repeat a developmental course one time which includes taking the course at another college or university. Students who cannot successfully pass a developmental course within two attempts will not be permitted to continue into their program of study. Students must pass developmental courses with a C or better. In addition, they must pass the entrance test. Students however, are not limited in the number of times they may take the entrance test.

College-level Courses

Students may repeat college-level courses to improve a grade, including a "W." Students may only repeat a course two times, which includes taking the course at another college or university. Students unable to successfully complete courses that are required for the graduation requirements of their desired major should discuss alternate graduation plans with their academic advisor.

Students do have the opportunity to appeal this policy to the vice-president for academic affairs if they feel they have extenuating circumstances that prevent them from adhering to the policy.

Withholding Grades/Degrees

The institution reserves the right to withhold a student's grades and/or degree if any loans or fines (for example, parking fines or library fines) are outstanding. Other situations for withholding grades include unmet financial obligations such as tuition fees or destruction or replacement of Commonwealth property. Students with unpaid loans or fines may view their grades in the Office of Financial Aid and Registration; however, no printed copy will be released to such students.

Advanced Placement

The College believes that placing students at the proper educational level will contribute to their success. Advanced placement is designed to give students credit for the learning they have acquired prior to entering

Thaddeus Stevens College. Students who have acquired skills and knowledge through advanced courses in high school, vocational/technical training, military service, or life/work experience, may be eligible for advanced placement.

Credit through Dual Enrollment

Students earn college credit by completing a college-level course at their home school. Usually this course is taken concurrently with a similar high school course of the same nature. Dual enrollment is usually pursued by a traditional student, and a grade is assigned.

Credit by Department Examination

Students who have skills superior to those taught in a required course may qualify for this option. Students may opt to take a "final" test as a means to acquire the credit without the cost and time devoted to a redundant course. Credit by department examination is usually pursued by a traditional student, but no grade is assigned.

Credit by Standardized Exams (AP, CLEP, Excelsior, etc.)

Students may take a nationally-recognized exam for different disciplines, and gain credit at a college that recognizes the test. Credit by a standardized exam is usually pursued by a traditional student, but no grade is assigned.

Credit for Life/Work Learning (Portfolio)

Students may prepare a portfolio of materials (training certificates, work experiences, seminars, businesses, etc.) that defend the acquisition of skills taught in a specific course. Faculty will evaluate the portfolio against the requirements for a specific course. Credit by portfolio for life/work experience is usually pursued by a nontraditional student, and (usually) no grade is assigned.

Credit for Military Training

College credit can be assigned for specific technical training received during military service (electronics, auto mechanics, etc.). Credit for military training is usually pursued by a nontraditional student, and no grade is assigned.

Credit for Formal Apprenticeship Training

College credit can be assigned for the completion of a formal apprenticeship program (machinist, plumbers and pipe fitters, electricians with the IBEW, etc.). Credit for formal apprenticeship is usually pursued by a nontraditional student, and no grade is assigned.

Credit by Articulation

Students may receive college credit for the completion of high school technical training if a formal articulation agreement exists between the high school and Thaddeus Stevens College. Credit by articulation is usually pursued by a traditional student, and no grade is assigned.

Credit by Program of Study (POS)

Students may receive college credit for completion of a statewide program of study (POS) if the College has established such an agreement. Credit by POS is usually pursued by a traditional student, and no grade is assigned.

Interested students should consult the registrar. Eligibility will be determined based upon substantial evidence of prior experience or course work. Advanced placement is then possible through testing and/or competency assessment determined by the appropriate department.

Advanced credit is not used in calculating the student's cumulative grade point average (GPA). Only the course number, title, and the number of credits will be entered on the transcript. No letter grades will be shown. Up to a maximum of half the total program requirements may be granted through nontraditional credit evaluation (advanced placement or credit by exam). Credit will only be granted to full-time students in good standing after one semester. Any exceptions to this policy will be at the discretion of the vice president for academic affairs.

Graduation Requirements

Students are accountable for meeting all graduation requirements. Although faculty advisors will assist in planning and scheduling courses, students bear the final responsibility for meeting all requirements.

Entering students must display basic competencies (reading, mathematics, and written expression) needed to succeed at Thaddeus Stevens College of Technology. Students who do not demonstrate these skills on placement tests will be required to complete specified remedial courses to improve competency levels. Students must obtain a "C" or better in a remedial course in order to move onto college-credit courses.

Associate Degree

To be eligible for an associate degree, students are required to satisfy the following:

- Complete all courses, both general education and technical, as set forth in this catalog as required within a

specific technical major. Substituting courses may only be done with the prior approval of the vice president for academic affairs. Only courses numbered 100 and above can be applied toward meeting graduation requirements for an associate degree.

- Earn at least an overall "C" average, a 2.0 cumulative quality point average (out of a possible 4.0), plus an overall "C" average (2.0 cumulative average) in one's technical major.
- Fulfill all financial obligations to Thaddeus Stevens College. Additional Information Students not having earned all the credits required for a degree after four semesters in a major may enroll in another accredited institution to fulfill requirements. It is strongly encouraged to confirm with the Registrar's Office a course will meet graduation requirements prior to enrolling in a class at another institution.

Any exceptions to graduation requirements must be approved by the vice president for academic affairs.

Graduating students are responsible for knowing and understanding all graduation and commencement requirements. This information includes commencement and rehearsal dates as issued by the vice president for academic affairs. Model schedules and catalog requirements are used to determine degree requirements.

Academic Good Standing

A full-time student must maintain at least 12 credits during a semester and must have earned a "C" average (2.0 cumulative GPA) and a "C" average in one's technical major to be in good standing.

Academic Probation

Students not maintaining an overall 2.0 cumulative grade point average (GPA) and/or a 2.0 cumulative GPA in their technical major at the end of any semester shall be placed on academic probation for the following semester.

At the conclusion of the probationary semester, students on probation must have a 2.0 or better semester GPA in the deficient area to avoid dismissal. If the semester minimum of 2.0 is achieved in the deficient area but the cumulative GPA or the cumulative GPA in the technical area is not above 2.0, students will remain on academic probation. If, at the conclusion of any probationary semester, students have below a 2.0 semester GPA in the deficient area, they will be dismissed from the College.

In order to ensure that students have the ability to monitor their GPAs, both the cumulative total GPA and the cumulative technical GPA will appear on the student's grade report.

Academic Dismissal

Decisions for academic dismissal shall be made by the vice president for academic affairs and will be based on a student's GPA. Students who have not earned a minimum 2.0 grade point average overall at the end of a semester during which the student is on academic probation shall be dismissed from the institution. Students must also earn an overall 2.0 grade point average in their major.

Students are responsible for meeting all requirements of the educational program. Any student not earning a minimum grade point average of 1.5 at the conclusion of a semester will be liable for dismissal.

Students dismissed from the institution may reapply the next academic year. Students may appeal academic dismissal. This procedure is found in the Student Handbook.

Withdrawal from Thaddeus Stevens College

Student Initiated

Students should meet with a counselor, complete a withdrawal questionnaire, and return it to the Office of Financial Aid and Registration. Students should also check with the Office of Financial Aid and Registration to see if they need to provide any information. Students should return all school properties to the appropriate parties. Room keys should be returned to the residence hall director or the director of residence life.

Withdrawing students should vacate the campus by 4:30 pm the day following the notification of withdrawal. In some instances, students will be asked to depart the evening of notification of withdrawal. The withdrawal from the college will be processed the day the form is received in the registrar's office.

Administrative Dismissal

Thaddeus Stevens College reserves the right to end the enrollment of any student if, in the opinion of the College, further association is not in the best interest of the student or the College.

The following may be causes for administrative dismissal of a student:

- Neglecting to meet financial obligations
- Not following the College's policies and procedures
- Failing to meet academic requirements
- Lack of effort or interest; failing to demonstrate safe policies
- Failing to be academically honest

Refunds

To be eligible for a refund, a student must have initiated and completed the entire withdrawal procedure. Refer to refund policy for further information.

Financial Aid Adjustments

1. Completed withdraw form with all appropriate signatures provided to the Registrar's Office for processing.
2. The Financial Aid Office (FAO) is notified of the withdraw by the Registrar's Office.
3. The FAO is required to recalculate the "Title IV" financial aid award on a pro-rated basis for the amount of time the student attended classes. The withdraw date is used to determine the length of time.
4. The FAO returns any funds to the Federal aid program. This often leaves the student with a bill due to the college.
5. The FAO will notify students by letter of the results of the calculation and the Business Office will send an invoice if a bill is due.

What aid is included in the calculation?

"Title IV Funds" refers to the federal financial aid programs authorized under the Higher Education Act of 1965 (as amended) and includes: Federal Direct Subsidized and Unsubsidized Loans, Federal Parent Loans to Undergraduate Students (PLUS), Federal Pell Grants, and Federal Supplemental Educational Opportunity Grant (FSEOG). The awards will be returned in the following order:

1. Federal Direct Unsubsidized Loan
2. Federal Direct Subsidized Loan
3. Federal Parent Loans to Undergraduate Students (PLUS)
4. Federal Pell Grant
5. Federal SEOG

PHEAA State Grant refunds will be calculated according to the institutional refund policy and appropriate amounts will be returned to PHEAA.

Student's withdrawal date is determined by when the college receives the school withdrawal form, is dismissed from the College or the College determines the student is no longer attending.

Exception: For veterans receiving veteran's benefits the withdrawal date is the last date of attendance or date of the last documented academically-related activity.

College Code of Conduct

Once admitted to the College, students agree to conduct themselves in a responsible manner that corresponds to acceptable mature adult standards of behavior. This code of conduct demands courtesy and respect for all staff and students. Being a member of the College community necessitates understanding and complying with all College regulations and directives while cooperating with those authorized to enforce them.

When students conduct themselves contrary to the best interest of Thaddeus Stevens College, they will be subject to penalties that could include suspension or expulsion. Students whose behavior violates the integrity of the campus, either socially or academically, will be terminated from the College. Additional information about student conduct at Thaddeus Stevens College and the student's judicial process may be found in the Student Handbook.

Computer Resources Acceptable Use Policy

The following policy contains the governing philosophy for regulating the use of the Thaddeus Stevens College of Technology's computing/information network facilities and resources. Access to the College's computing/network facilities and resources is a privilege granted solely to Thaddeus Stevens College of Technology faculty, staff, registered students, and those with special accounts. All users of the computing/information network's facilities must act responsibly and maintain the integrity of these resources. The College reserves the rights to limit, restrict, or extend computing/information network privileges and access to its resources.

Those who do not abide by the policies listed below are subject to suspension of computer privileges and possible referral to the appropriate judicial process.

The vice president for finance and administration should be notified about potential violations of laws and policies governing information use, intellectual property rights, or copyrights. Computer and network services should be notified about potential loopholes in the security of its computer systems and networks. The user community is expected to cooperate with the computing department in its operation of computer systems and information networks as well as in the investigation of misuse or abuse. Should the security of a computer system or information network be threatened, suspected user files may be examined.

Policies

- Individuals shall use only their assigned network ID unless multiple access has been authorized for the ID.
- Users may use only the password(s) provided to them and shall not try in any way to obtain a password for another user's network ID.
- Users may not attempt to disguise the identity of the account or machine they are using.
- Use of the College's network resources to gain or attempt to gain unauthorized access to remote computers is prohibited.
- Any deliberate act which may seriously impact the operation of computers, terminals, peripherals, or networks is prohibited. Such acts include, but are not limited to, the following: tampering with components of a local area network (LAN) or the high-speed backbone network, otherwise blocking communication lines, or interfering with the operational readiness of a computer.
- No person shall knowingly run or install on any of the College's computer systems, or give to another, a program which could result in the eventual damage to a file, computer system, or information network, and/or the reproduction of itself. This is directed towards, but not limited to, the classes of programs known as computer viruses, Trojan horses, and worms.
- No person shall attempt to circumvent data protection schemes or uncover security loopholes.
- All persons shall abide by the terms of all software licensing agreements and copyright laws. In particular, unauthorized copying of copyrighted software is prohibited, unless the College has a site license specifically allowing the copying of that software. Furthermore, the copying of site-licensed software for distribution to persons other than Thaddeus Stevens College of Technology faculty, staff, and students, or the copying of site licensed software for use at locations not covered under the terms of the license agreement, is prohibited.
- Deliberate acts which are wasteful of computing/information network resources or which unfairly monopolize resources to the exclusion of others are prohibited. These acts include, but are not limited to, sending mass mailings or chain letters, creating unnecessary multiple jobs or processes, obtaining unnecessary output, or printing or creating unnecessary network traffic.
- The following types of information or software cannot be placed on any College-owned computer system:
 - That which infringes upon the rights of another person.
 - That which may injure someone else and/or lead to a lawsuit or criminal charges. Examples of these include the following: pirated software, destructive software, pornographic materials, or libelous statements.
 - That which consists of any advertisements or commercial enterprises.
- No person shall harass others by sending annoying, threatening, libelous, sexually, racially, or religiously offensive messages. This includes all materials deemed offensive by existing College code of conduct laws.
- Use of the College's computer/information network resources to monitor another user's data communications, or to read, copy, change, or delete another user's files or software, without permission of the owner, is prohibited.
- Use of the College's servers, workstations, or information networks must be related to a Thaddeus Stevens College of Technology course, research project, work-related activity, departmental activity, or for interpersonal communications. Use of these resources for personal or financial gain is prohibited. If the nonbusiness usage of information services results in a direct cost to the College for any reason, it is the individual's responsibility to reimburse the College.
- Any network traffic exiting the College and/or using College resources/infrastructure is subject to the acceptable use policies of the network through which it flows (internet, D&E), as well as to the policies listed here, such as abusing internet service providers (ISP) services using College network/resources. Existing College policies such as the sexual harassment policy, will be enforced as they relate to a violation of the computer use policy.
- Potential violators may also be subject to criminal prosecution under federal or state law, and should expect the College to pursue such action.

Consequences

Violation of one or more of these published policies will result in a loss of access to the College computing/information network systems with possible referral to the appropriate judicial process as above.

Violators may also be subject to criminal prosecution under federal or state law and should expect the College to pursue such action. As an example, under Pennsylvania law, it is a felony punishable by a fine up to \$15,000 and imprisonment up to seven years for any person to access, alter, or damage

any computer system, network, software or database, or any part thereof, with the intent to interrupt the normal functioning of an organization [18 Pa.C.S. §7611(a)(2) and (3)].

Attendance Policy

Attendance is important for success at Thaddeus Stevens College; therefore, regular and prompt attendance for classes and scheduled conferences is expected for all students.

Instructors distribute attendance requirements in their course syllabi at the beginning of the semester. Students are responsible for reading and understanding these requirements for each course, whether they are general education or technical courses.

The faculty will recognize only the following as legitimate excuses for absence:

- Death in the immediate family
- Hospitalization
- Illness verified by a doctor's excuse indicating the nature of the illness and type of medication prescribed
- College activities as approved by the vice president for academic affairs or director of student services
- Circumstances as verified by a campus counselor

Advisory Committees

Because of the technical nature of the programs of instruction at Thaddeus Stevens College, advisory committees undertake an essential role in technical program review and development, equipment purchases, student recruitment, and student job placement. Advisory committees gather at least twice a year; minutes of these meetings are kept on file in the Office of Academic Affairs. Members of advisory committees include instructors, administrators, business owners, professional and technical employees, and representatives of industry and labor.

Changes to Catalog and Curriculum

The provisions and conditions of this catalog are not to be considered an irrevocable contract between the student and Thaddeus Stevens College of Technology. The College reserves the right to change any fees, requirements, and/or regulations at any time during the student's term of enrollment. Approved curriculum changes may be implemented the semester following approval, provided they do not impact unfairly on the student.



Academic Calendar: 2020 - 2021

■ Fall Semester 2020

Aug. 18-19	New Faculty Orientation
Aug. 20-21	Faculty Professional Development
Aug. 24	Fall Classes Begin-Drop/Add Begins
Aug. 28	Drop/Add ends for General Studies
Sept. 4	Fall Semester Officially Enrolled Census Date
Sept. 7	Classes in Session
Oct. 9	Review/Approval of Spring Schedule
Oct. 12	Classes in Session
Oct. 17	Open House
Oct. 23	Mid-Term Grades Due by 12 Noon via College Portal
Nov. 17 - Dec. 4	Sophomore Registration for Spring 2021
Nov. 18 - Dec. 4	Freshman Registration for Spring 2021
Nov. 19 - Dec. 4	Pre-Major Registration for Spring 2021
Nov. 24	Deadline to Withdraw from Courses without Penalty
Nov. 24	Last Day of In-Person Classes
Nov. 25-30	Fall Break-No Classes
Dec. 1-16	All Classes Move to Online Learning
Dec. 7-16	Student Academic Opinion Survey Window
Dec. 16	Classes End
Dec. 21	Grades Due-12 Noon via College Portal
Dec. 22	Course Assessments due in Office of Assessment

■ August

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■ September

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■ October

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■ November

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■ December

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Administration & Directors

Senior Administration

Pedro A. Rivera, President

MS: Cheyney University
BS: Pennsylvania State University

Timothy Bianchi, Ph.D., Vice President

Ph.D., M.Ed. The Pennsylvania State University
MS: Millersville University
BS: Millersville University

Michael DeGroff, Dean of Academic Affairs

MA: University of Phoenix
BS: Elizabethtown College
AAS: Thaddeus Stevens College of Technology

Christopher Metzler, Ph.D., Dean of Student Services

PhD: Northcentral University
MEd, BS: Clemson University

Melissa Wisniewski, Dean of Enrollment Services

MBA: Millersville University
BS: Millersville University

Directors

Valdijah Ambrose Brown, Director of ACT 101/EOP

MSEd: Drexel University
MSW: Temple University
BA: Millersville University

Laurie Q. Grove, Director of Career Services

BS: Indiana University of Pennsylvania

Jason Kuntz, Director of Residence Life

MEd: University of South Carolina
BA: Baldwin Wallace College

Cheryl Lutz, Director of Assessment and Accountability

MA: College of Notre Dame of Maryland
BSEd: Millersville University
AA: Reading Area Community College

Tony R. Miller, Director of Buildings & Event Coordinator

Alex Munro, Executive Director and Government Affairs

Postsecondary Vocational Diploma: Thaddeus Stevens
College of Technology

Gregory Seitz, Director of Information Technology

AS: Harrisburg Area Community College

Warren Taylor, Director of Development

AAS: Thaddeus Stevens College of Technology

Ann Valuch, Director of Marketing

MS: Shippensburg University
BA: Penn State University

Sheri L. Wright, Director Academic Center

M. Ed. Loyola University
MBA: University of Maryland
BBA: Loyola University

Emily Smoker, Director of Financial Aid

BS from Shippensburg University.

Stacy Scott, Registrar

BS: Albright College

Non-Discrimination Statement

Thaddeus Stevens College of Technology will not discriminate in its educational programs, activities, or employment practices on the basis of race, color, national origin, sex, sexual orientation, gender identity, disability, age, religion, ancestry, union membership, or any other legally protected classification. Announcement of this policy is in accordance with state and federal laws, including Title IX of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, and the American Disabilities Act of 1991.

Employees and participants who have an inquiry or complaint of harassment or discrimination, or who need information about accommodations for persons with disabilities, should contact Betty Tompos, Affirmative Action Officer, Thaddeus Stevens College of Technology, 750 East King Street, Lancaster, PA 17602. Phone: (717) 299-7749 or 1-800-842-3832.

Declaración de No-Discriminación

Thaddeus Stevens College of Technology no discrimina en sus programas educativos, actividades

o en prácticas de empleo debido a raza, color, origen nacional, sexo, orientación sexual, identidad sexual, incapacidades físicas o mentales, edad, religión, linaje, o por ser miembro de una unión

o sindicato, o de cualquier otro grupo protegido por la ley. Esta declaración está de acuerdo a las leyes estatales y federales, incluyendo el Título IX de las Enmiendas de Educación de 1972, las Secciones 503 y 504 del Acta de Rehabilitación de 1973, y el Acta de los Estadounidenses Incapacitados (ADA sigla en inglés) de 1991.

Los empleados y los participantes que tienen alguna pregunta o alguna queja de acoso o de discriminación, o necesitan información para recibir ayuda para personas con incapacidades físicas o mentales, deben ponerse en contacto con Betty Tompos, Affirmative Action Officer, Thaddeus Stevens College of Technology, 750 East King Street, Lancaster, PA 17602. Teléfono: 717-299-7749 o 1-800-842-3832.

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Students are responsible for fulfilling all requirements for graduation set forth by the College. Although an advisor may assist in the planning of a program of study, the final responsibility for meeting the requirements remains with the student.