

Aeronautics

Aviation 1
Aviation 2
Drones: UAS
Principles of Aeronautical Science
Private Pilot Operations

Architecture

Engineering Design
Advanced Engineering Design
Architectural Engineering Design 1, 2

Automotive

Small Engines
Engine Rebuild & Diagnostics
Car Care Essentials
Automotive Engineering & Fabrication
Automotive Service & Diagnostics

Engineering

Engineering and Invention 1, 2
Engineering Design
Advanced Engineering Design
Robotics 1
Robotics 2

Furniture Making

Introduction to Furniture Making 1, 2
Furniture & Cabinet Making I, II

General Electives

Adaptive Tech Leader (2025-2026)
Home Maintenance and Repair
Career Internship

Applied Technology

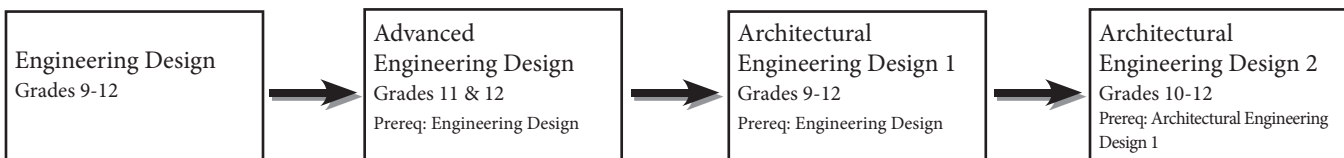
Applied Technology Department Mission Statement

Career and Technical Education allows students to explore their interests and abilities through a wide range of courses and experiences. CTE equips students with the ability to apply academic skills to the exploration of career pathways. Through hands-on activities, project-based learning, and partnering with industry and educational institutions, CTE prepares students for careers and provides opportunities for post-secondary credits and industry certifications.

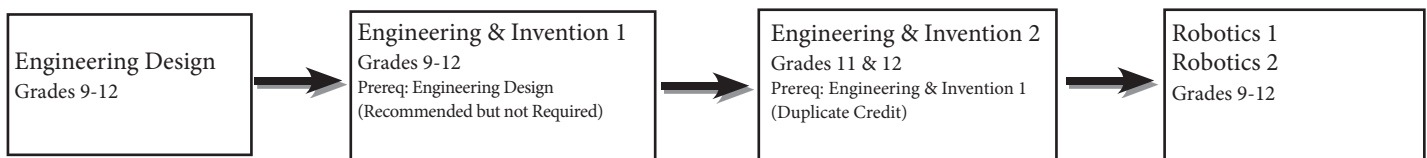
Career Pathway Sequences

Below are recommended course sequences for students based on their career interest. Students can take these courses at any time while attending LTHS. These sequences are only recommendations and a student may start taking courses in one sequence and change to another provided they meet any prerequisites for the courses they wish to take or the approval of the Division Chair.

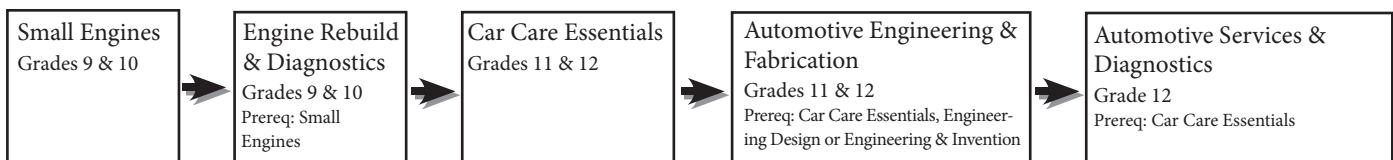
Recommended Engineering Design Pathway



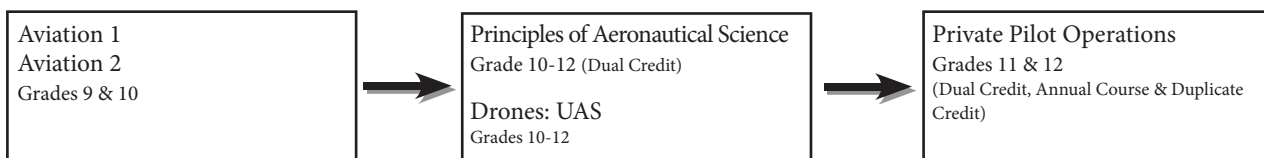
Recommended Engineering Pathway



Recommended Automotive Technology Pathway



Recommended Aviation Pathway



Recommended Furniture & Cabinet Making Pathway



Applied Technology Department Standards

The Applied Technology Department has established standards based on resources gathered from national and state professional organizations in the fields of technology, technology education, engineering, science and math, and career development. There are nine general standards as indicated below. Each general standard is supported by specific student learning standards that are available upon request. Specific course standards have been developed to support the general standards and these are distributed to students at the beginning of each semester, or annual course.

Students within Applied Technology will be able to....

1. select/use appropriate technological instruments/tools and formulas to solve problems, interpret results, and communicate findings.
2. accept opportunities to develop expertise, experience, and emotional intelligence for transferable employability skills in relation to individual, career, and community roles and responsibilities.
3. develop skills, strategies, expertise, experience, and emotional intelligence for career exploration and transferability skills in relation to the career clusters of technology, transportation, communication, and manufacturing.
4. analyze the internal and external factors that influence individual, work teams, and commercial enterprises.
5. develop and apply strategies to manage conflict and stress in individual and team situations.
6. recognize and be able to demonstrate effective verbal and non-verbal communication skills.
7. evaluate decisions in relation to available resources and options.
8. demonstrate leadership skills and abilities reflecting democratic ideals at school, in the workplace, and in the community.
9. promote optimal growth, development, and learning of self, family, community, and others as a life-long activity.

- All courses listed under Applied Technology apply toward the Practical Arts graduation requirement.
- **Independent Study** Under specific conditions as outlined on p. 25 of the **Guide**, students may make application for Independent Study. In all cases, students must secure parent, teacher, counselor, divisional, and building administration approval. Independent Study may not be taken as an 8th semester/annual course.

AERONAUTICS

Aviation 1

Credit: 1/2	Level: IV
Grade Offered: 9, 10	Fall AT5156
	Spring AT5157
Prerequisite: None	

This course provides a foundation in flying and unmanned aircraft systems (drones). Students will learn about the engineering process, problem solving, and innovations and technological developments that led to the aviation and aerospace industries of today. Students will learn problem-solving that served as the basis for today's modern space exploration. Students will also gain historical perspective from earliest flying machines to modern aircraft and the integral role aviation plays in today's world. This is a hands-on course and you will learn to fly on simulators and a real airplane.

Aviation 2

Credit: 1/2	Level: III
Grade Offered: 9, 10	Fall AT5166
	Spring AT5167
Prerequisite: None	

This core aerospace and aviation course is designed to give students a clear understanding of career opportunities in aviation and aerospace and the critical issues affecting the aviation system. Student will explore modern innovations and will develop their own ideas to address real-world aviation industry challenges. This is a hands on course and students will have opportunities to fly on simulators and a real airplane.

Principles of Aeronautical Science ERAU AS120 (3cr)

Credit: 1/2	Level: IV
Grade Offered: 10	Fall AT5216
	Spring AT5217
11, 12	Fall AT5211
	Spring AT5212
Prerequisite: Minimum 2.5 unweighted GPA per ERAU	

Principles of Aeronautical Science is a survey course. Modes of aerodynamic travel are studied in this course. This course discusses advanced aircraft and the technology around them. Aerodynamic forces are explored

through hands-on projects. Subjects include aircraft history, categories, as well as developments in aviation. You will also get hands on with flight simulation and in a real airplane! **Transcripted college credit with Embry-Riddle Aeronautical University.**

Drones: UAS

Credit: 1/2	Level: IV
Grade Offered: 10	Fall AT5176
	Spring AT5177
11, 12	Fall AT5171
	Spring AT5172
Prerequisite: Aviation 1 or Principles of Aeronautical Science	

This course focuses on flight operations of Unmanned Aircraft Systems (UAS), commonly referred to as drones. Emphasis is put on the commercial history, growth, and application of UAS. This course will provide acquisition, use, and operation of UAS with an emphasis on operations. This class will use various DJI and Parrot drones to teach students safe flight procedures and operations. Students will be prepared to take the Federal Aviation Administration Part 107 Certification Exam to obtain their Remote Pilot Certificate with a sUAS (drones under 55 lbs.) endorsement. With this license you can get paid to fly your drone!

Private Pilot Operations ERAU AS121 (5cr)

Credit: 1 (dc)	Level: V
Grade Offered: 11, 12	Annual AT3361
	AT3362
Prerequisite: Principles of Aeronautical Science and minimum 2.5 unweighted GPA per ERAU	

This course develops aeronautical knowledge required for certification as a Private Pilot with an Airplane Single Engine Land rating. Topics include regulations, safety, pre-solo operations, cross-country planning, airspace, chart use, communications, weather, performance, weight and balance, aerodynamics, and decision-making. The student will utilize simulation in class so that they can apply knowledge of the subject to the aircraft. **Transcripted college credit with Embry-Riddle Aeronautical University.**

ARCHITECTURE

Engineering Design

Credit: 1/2 (cr/nc)	Level: IV
Grade Offered: 9, 10	Fall AT5536
	Spring AT5537
11, 12	Fall AT5531
	Spring AT5532

Prerequisite: None

Drafting is a valuable part of our global society. It is sometimes referred to as the “universal language.” This course is an excellent choice for those students wishing to explore the field of drafting, planning a career in engineering, architecture, construction, interior design or other related fields. CAD (Drafting) projects include: learning the AutoCAD and Fusion 360 software, multi-view drawing, dimension drawings, section drawings, and isometric drawings. 2D drawings will be covered in the first part of the semester followed an introduction to basic 3D drafting in the second part of the semester. **Students may receive four college credits with Triton College upon successful completion of this dual credit course.**

Advanced Engineering Design

Credit: 1/2 (cr/nc)	Level: IV
Grade offered: 11, 12	Fall AT8531
	Spring AT8532

Prerequisite: Engineering Design

This course studies three-dimensional (3D) CAD techniques and applications with emphasis on increasing productivity in the creation and editing of 3D models using Autodesk Fusion 360 software. Units focus on the nature of solid modeling as contrasted with traditional two-dimensional techniques emphasizing mechanical applications and include development and editing of solid entities, wireframe modeling, surfacing, shading, 3D primitives of solids, plotting 3D models on the 3D printer, and generating solids that aid in 3D construction models in manufacturing situations.

Architectural Engineering Design 1

Credit: 1/2 (cr/nc)	Level: IV
Grade Offered: 9, 10	Fall AT9216
	Spring AT9217
11, 12	Fall AT9211
	Spring AT9212

Prerequisite: Engineering Design

Students will begin exploring the architectural career field. This course covers the architectural drafting fundamentals, planning, and design. We will study architectural home style and the basic home designs that go into the different styles. A focus will be placed on designing a home concerning the understanding of how

the living, sleeping, and service area layouts are essential to creating an efficient and effective home design. Students will be using Autodesk Revit software to create 2D and 3D homes. Students will complete the course by designing their dream home.

Architectural Engineering Design 2

Credit: 1/2 (cr/nc)	Level: IV
Grade Offered: 10	Fall AT9316
	Spring AT9317
11, 12	Fall AT9311
	Spring AT9312

Prerequisite: Architectural Engineering Design I

Students will continue exploring the architectural career field. This course covers plot plan development, construction systems, utilities, and presentation methods. The course covers common residential construction materials, components, and systems related to wood and metal framing structures. Students will produce a professional set of presentation drawings and rendering models of their dream home they created in Architectural Engineering Design I. Students will be using Autodesk Revit software to create 2D and 3D homes.

AUTOMOTIVE

Small Engines

Credit: 1/2 (cr/nc)	Level: III
Grade Offered: 9, 10	Fall AT6226
	Spring AT6227

Prerequisite: None

Small Engines is the first class taken on the road to become a qualified automotive technician. The course introduces the small engine and uses it to demonstrate in-depth concepts like 4 stroke theory, thermodynamics, and alternative fuel sources in a fun, lab centered environment. Students will understand the parts of an engine, how they interact together, and how to disassemble and reassemble its components. Students will also learn diagnostic procedures to resolve common issues and become proficient in rebuilding carburetors, testing ignition systems, fuel systems, and replacing broken parts. **Students may receive three college credits with College of DuPage upon successful completion of this dual credit course.-**

Engine Rebuild & Diagnostics

Credit: 1/2	Level: IV
Grade Offered: 9, 10	Fall AT6346
	Spring AT6347

Prerequisite: Small Engines

This course allows a comprehensive tear down, diagnosis, and rebuild of two of the industry's top performance engines. Students will have the opportunity to work on Chevrolet 350 V8 and LS based engines. These 400 horse power engines will be torn down to a bare crankshaft and fully rebuilt with all new gaskets. The motors will then be started and checked for proper operation on a live engine test stand and revved to 6000 RPM. Advanced engine building techniques will be discussed, diagnostic procedures will be practiced, factories will be toured, and students will have the opportunity to learn about high performance options such as turbochargers, superchargers, and nitrous.

Car Care Essentials

Credit: 1/2 (cr/nc)	Level: IV
Grade Offered: 11, 12	Fall AT5911
	Spring AT5912

Prerequisite: None

Don't leave home without it! This course will teach the necessary skills in basic car care, preventative maintenance, and roadside safety. Students will learn how to maximize the life of a vehicle while saving money and becoming a self-sufficient automotive technician. Students will have the opportunity to work on live vehicle repairs after covering units such as under hood checks, oil / lubrication, roadside safety, tires, brakes, purchasing new/used vehicles, and professional automotive detailing. This course is the foundation of the automotive program.

Automotive Engineering & Fabrication

Credit: 1/2 (cr/nc) (dc)	Level: IV
Grade Offered: 11, 12	Fall AT6351
	Spring AT6352

Prerequisite: Car Care Essentials or Engineering Design or Engineering & Invention 1

This course focuses on the research, design, and fabrication aspects of the automotive industry. Students will have the opportunity to design, engineer, and build custom projects of their choice after completing 10 unique mini labs. These mini labs include fabricating metal roses, a phone stand, CNC cut name tags, and even learning CAD/CAM design software. Students will become proficient using fabrication equipment like MIG welders, TIG welders, pipe notchers, pipe benders, box ban breaks, bead rollers, english wheels, vertical mills, lathes, and bandsaws. "Duplicate Credit" students will

complete a semester-long final project where they have the option to build a motorized project, work on our SEMA hot rod, or a custom project of their dreams. The only limit to this course is your imagination. **Students may receive four college credits with Triton College upon successful completion of this dual credit course.**

Automotive Service & Diagnostics

Credit: 1 (cr/nc)	Level: IV
Grade Offered: 12	Annual AT5311
	AT5312

Prerequisite: Car Care Essentials

Automotive Service and Diagnostics is the culminating course of the LTCC Automotive Program that expands on the skills learned in Car Care Essentials. Students will have the opportunity to complete live lab work on a variety of vehicles after covering units focusing on brakes, cooling systems, steering, suspension, drivetrain, starting/charging systems, and OBD2 /vehicle diagnostics. Students will become proficient technicians by using manufacturing specific tools, scan tools, and digital multimeters. Students will also communicate as a service consultant with the vehicle's respective owners, manage lab teams, and become career ready.

ENGINEERING

Engineering and Invention 1

Credit: 1/2 (cr/nc)	Level: IV
Grade Offered: 9, 10	Fall AT9546
	Spring AT9547
	Fall AT9541
	Spring AT9542

Prerequisite: None

This is a course for the student who wants to explore engineering as a career. This course uses STEM (Science, Technology, Engineering, and Mathematics) project-based assignments to explore and understand the engineering design process. Problem solving is utilized to overcome problems of design, development, production, and testing of a product. Topics covered include mechanical, structural, electrical, hydraulics, robotics, and programming. Students will use a variety of software programs to design, test, and analyze problems. Students will work in design teams and present their findings to the class in various applications. **Students may receive four college credits with Triton College upon successful completion of this dual credit course.**

Furniture/Cabinet Making I

Credit: 1 (cr/nc)	Level: IV
Grade Offered: 9, 10	Annual AT5846 AT5847
11, 12	Annual AT5821 AT5822

Prerequisite: None

This course will allow the student to study furniture making by using hand tools, power tools, and industrial machinery. During this year-long course, students will be given the opportunity to make a flat paneled, solid hardwood, blanket chest. Standard choice of lumber is red oak. For an additional cost, students can choose to upgrade to ash, quartered red oak, quartered white oak, or cherry during the first two weeks of the class. **Students will be responsible for basic red oak lumber and hardware fees of \$110.00.**

Furniture/Cabinet Making II

Credit: 1 (cr/nc) (dc)	Level: IV
Grade Offered: 10	Annual AT5856 AT5857
11, 12	Annual AT5851 AT5852

Prerequisite: Furniture and Cabinet Making I

This course has been designed to allow students to continue to study advanced furniture making skills. Students will build on the previous year's knowledge through the opportunity to make a solid wood computer table/writing desk with turned legs, and with a pullout keyboard and/or dovetailed drawer boxes. Standard choice of lumber is red oak. For an additional cost, students can choose to upgrade to ash, quartered red oak, quartered white oak, or cherry during the first two weeks of the class. **Students will be responsible for basic red oak lumber and hardware fees of \$135.00.**

Students taking the course for duplicate credit (DC) will make a small entertainment console by using veneered plywood, solid wood face frames mitered into flat paneled sides, dovetailed drawer boxes, flat paneled drawer fronts and solid flat paneled doors, and adjustable shelving. Choices of woods are red oak, quartered red oak, white oak, quartered white oak, and cherry. **Students will be responsible for lumber and hardware fees that range between \$290 to \$450.00, depending upon the lumber chosen.**

GENERAL ELECTIVES

Adaptive Tech Leader (offered 2025-2026)

Credit: 1/2	Level: III
Grade Offered: 10	Spring AT7107
11, 12	Spring AT7102

Prerequisite: None

This is a one semester course designed for any student who is interested in working alongside special education peers within a culinary arts/art/music/Applied Tech course. Students will develop an understanding and gain experience in: modifying activities to meet individual needs, developing lessons and assisting with instruction, and working alongside peers with special needs to develop meaningful connections. Students will be involved in partnering with and assisting students in acquiring skills through a variety of engaging activities. This course fulfills a creative/practical art elective requirement.

Home Maintenance and Repair

Credit: 1/2 (cr/nc)	Level: II
Grade Offered: 11, 12	Fall AT5221 Spring AT5222

Prerequisite: None

This course is for students who wish to learn the basic skills in maintaining a home. Students will learn how to repair basic electrical circuits, basic framing construction, drywall installation, mudding/taping and hole repair for drywall, painting, installation of ceramic tile, basic plumbing of copper and PVC, and demolition. Skills developed will help students maintain, upgrade and care for a home while saving money by doing the work themselves.

Career Internship Program

Credit: 1/2 (dc)	Level: IV
Grade Offered: 11, 12	Fall AT5571 Spring AT5572 Summer AT5558 or AT5559

This course is designed for a student who has already secured an internship in partnership with their LT teacher in this department. Detailed information about qualifying for a Career Internship Program class can be found on page 10 of the Guide. It is the sole discretion of each department team to recommend a student for a career internship. An application does not guarantee admission.

Applied Technology Classes

When choosing Annual Courses, you will need the first and second semester codes.

Freshman Courses

Annual

AT5846/7 Furniture / Cabinetmaking I

Fall Only

AT5156 Aviation 1
 AT5166 Aviation 2
 AT5536 Engineering Design
 AT9546 Engineering & Invention 1
 AT5616 Robotics 1
 AT5626 Robotics 2
 AT5716 Intro Furniture Making 1
 AT5726 Intro Furniture Making 2
 AT6226 Small Engines
 AT6346 Engine Rebuild & Diagnostics

Spring Only

AT5157 Aviation 1
 AT5167 Aviation 2
 AT5537 Engineering Design
 AT9547 Engineering & Invention 1
 AT5617 Robotics 1
 AT5627 Robotics 2
 AT5717 Intro Furniture Making 1
 AT5727 Intro Furniture Making 2
 AT6227 Small Engines
 AT6347 Engine Rebuild & Diagnostics

Sophomore Courses

Annual

AT5846/7 Furniture / Cabinetmaking I
 AT5856/7 Furniture / Cabinetmaking II

Fall Only

AT5156 Aviation 1
 AT5166 Aviation 2
 AT5176 Drones: UAS
 AT5216 Principles of Aeronautical Science
 AT5536 Engineering Design
 AT9216 Architectural Engineering Design 1
 AT9316 Architectural Engineering Design 2
 AT9546 Engineering & Invention 1
 AT5616 Robotics 1
 AT5626 Robotics 2
 AT5716 Intro Furniture Making 1
 AT5726 Intro Furniture Making 2
 AT6226 Small Engines
 AT6346 Engine Rebuild & Diagnostics

Spring Only

AT5157 Aviation 1
 AT5167 Aviation 2
 AT5177 Drones: UAS
 AT5217 Principles of Aeronautical Science
 AT5537 Engineering Design
 AT9217 Architectural Engineering Design 1
 AT9317 Architectural Engineering Design 2
 AT9547 Engineering & Invention 1
 AT5617 Robotics 1
 AT5627 Robotics 2
 AT7107 Adaptive Tech Leader

Sophomore Courses

Spring Only (cont'd)

AT5717 Intro Furniture Making 1
 AT5727 Intro Furniture Making 2
 AT6227 Small Engines
 AT6347 Engine Rebuild & Diagnostics

Junior and Senior Courses

Annual

AT3361/2 Private Pilot Operations
 AT9311/2 Architectural Engineering Design II
 AT5311/2 Automotive Service & Diagnostics
 AT5821/2 Furniture / Cabinetmaking I
 AT5851/2 Furniture / Cabinetmaking II

Fall Only

AT5171 Drones: UAS
 AT5211 Principles of Aeronautical Science
 AT3361 Private Pilot Operations
 AT5911 Car Care Essentials
 AT5571 Career Internship
 AT5531 Engineering Design
 AT9541 Engineering & Invention 1
 AT6411 Engineering & Invention 2
 AT8531 Advanced Engineering Design
 AT9211 Architectural Engineering Design 1
 AT9311 Architectural Engineering Design 2
 AT5611 Robotics 1
 AT5621 Robotics 2
 AT5711 Intro Furniture Making 1
 AT5721 Intro Furniture Making 2
 AT5221 Home Maintenance and Repair
 AT6351 Automotive Engineering & Fabrication

Spring Only

AT5172 Drones: UAS
 AT5212 Principles of Aeronautical Science
 AT3362 Private Pilot Operations
 AT5912 Car Care Essentials
 AT5572 Career Internship
 AT5532 Engineering Design
 AT9542 Engineering & Invention 1
 AT6412 Engineering & Invention 2
 AT8532 Advanced Engineering Design
 AT9212 Architectural Engineering Design 1
 AT9312 Architectural Engineering Design 2
 AT5612 Robotics 1
 AT5622 Robotics 2
 AT5712 Intro Furniture Making 1
 AT5722 Intro Furniture Making 2
 AT5222 Home Maintenance and Repair
 AT6352 Automotive Engineering & Fabrication
 AT7102 Adaptive Tech Leader