

## **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/Power  
Engine Rebuild & Diagnostics  
Car Care Essentials  
Automotive Engineering & Fabrication  
Automotive Service & Diagnostics

## **Engineering**

Engineering and Invention 1, 2  
Engineering Design  
Advanced Engineering Design

## **Furniture Making**

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

## **General Electives**

Home Maintenance and Repair  
Industrial & Related Occupations I, II  
Career Internship

# *Applied Technology*

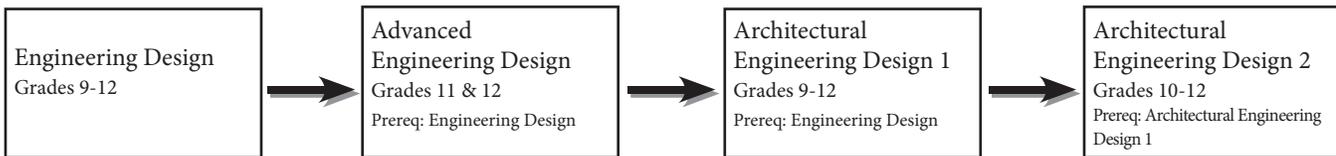
## Applied Technology Department Philosophy

The Applied Technology Department empowers the student to understand, utilize, and apply comprehensive technology skills that exist in higher education and the workplace. The department assists the student in the development of teamwork, analytical, and problem solving skills. The development of leadership abilities is present throughout the curriculum. The department fosters creativity, independence, self-reliance, and self-sufficiency through comprehensive, progressive programming.

## 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.

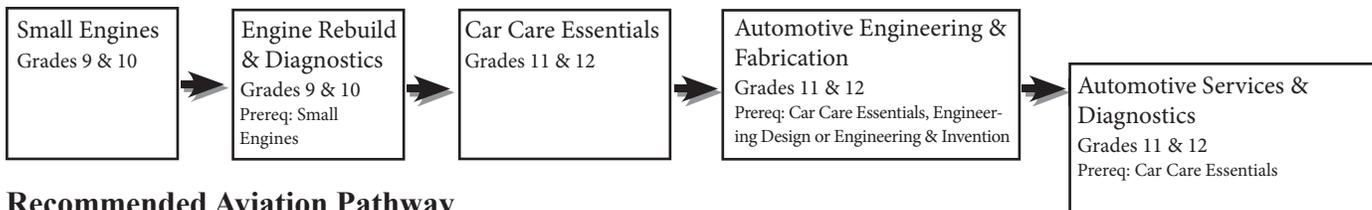
### Recommended Engineering Design Pathway



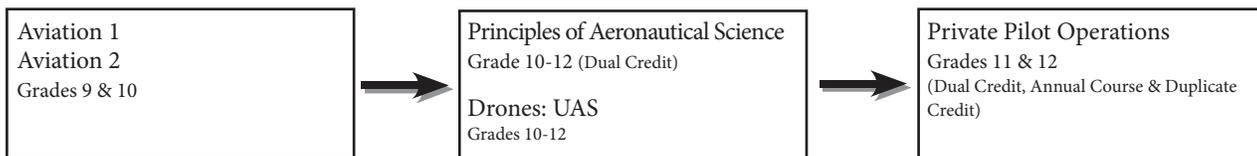
### Recommended Engineering Pathway



### 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.*

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## **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	Spring AT5166 Fall 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: None	

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! **Transcribed 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	

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. **Transcribed college credit with Embry-Riddle Aeronautical University.**

# ARCHITECTURE

## Engineering Design

Credit: 1/2 (cr/nc)	Level: III or 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. **This course can earn dual credit through Triton College.**

## 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. **This course can earn dual credit through Triton College.**

## Architectural Engineering Design I

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 essen-

tial 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 II

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 such as 2 and 4 stroke theory, combustion, thermodynamics, torque, and also touches on alternative fuel sources. Students will understand the parts of the engine, how they work together for an engine to perform correctly, and how to disassemble and reassemble a 4 stroke engine. Students will also learn diagnostic procedures to resolve common issues with small engines and be proficient in skills including rebuilding carburetors, testing spark and fuel systems, and repairing or replacing parts of a small engine.

## 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 road-side 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, 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 motorized vehicles using 3D software, learn to fabricate (roll cages, crash bars, custom exhausts, turbo kits, etc.) and even build classic hot rods that will be debuted at SEMA show. Students will learn skills such as MIG welding, TIG welding, sheet metal fabrication, minor body work, and much more. The only limit to this course is your imagination. **This course can earn dual credit through Triton College.**

## 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 capstone course of the LTCC Automotive Program that harnesses the skills learned in Car Care Essentials. Students will become proficient technicians by using equipment such

as scan tools, digital oscilloscopes, emissions gas analyzers, and digital multi-meters. Course units will focus on brakes, steering, suspension, drivetrain, starting and charging systems, and OBD2 /vehicle diagnostics. Students will also have the opportunity to complete live lab work on a variety of vehicles requiring students to communicate as a service consultant with the vehicles respective owners, set up appointments, and manage lab teams to become career ready. **This course can earn dual credit through Triton College.**

## ENGINEERING

### Engineering and Invention 1

Credit: 1/2 (cr/nc) Level: III or IV  
 Grade Offered: 9, 10 Fall AT5546  
 11,12 Spring AT5547  
 Fall AT5541  
 Spring AT5542

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. **This course can earn dual credit through Triton College.**

### Engineering and Invention 2

Credit: 1/2 (cr/nc) (dc) Level: IV  
 Grade Offered: 11, 12 Fall AT6411  
 Spring AT6412

Prerequisite: Algebra I (Accel) or higher, or concurrent enrollment in Algebra I (Accel) or higher, Engineering and Invention 1, Principles of Aeronautical Science

This is a continuing course of Engineering 1. Still using STEM (Science, Technology, Engineering, Mathematics) project based assignments. Problem solving is utilized to overcome problems of design, development, production, and the testing of a product. Topics covered could include but not limited to; mechanical, structural, pneumatics, vacuum forming, robotics, and materials. Students will use a variety of softwares to design, test, and analyze problems. Students will work in design teams and present their finds to the class in various applications.

# FURNITURE MAKING

## Introduction to Furniture Making 1

Credit: 1/2 (cr/nc)	Level: III
Grade Offered: 9, 10	Fall AT5716
	Spring AT5717
11, 12	Fall AT5711
	Spring AT5712
Prerequisite: None	

This course is designed to introduce the student to the safe operation of industrial machinery, power tools, and hand tools. Students will complete three projects designed to teach the fundamentals of basic joinery, growth ring lay out, gluing/clamping, and finishing techniques. We begin with an in-depth study of the machinery and power tools used in this industry with a major examination of how they work, and most importantly, how to use them in a safe and productive manner to produce furniture. Each student will then have an opportunity to make several beginning level projects that he/she will bring home throughout the semester. **Students will be responsible for lumber and hardware fees of \$45.00.**

## Introduction to Furniture Making 2

Credit: 1/2 (cr/nc)	Level: III
Grade Offered: 9, 10	Fall AT5726
	Spring AT5727
11, 12	Fall AT5721
	Spring AT5722
Prerequisite: Introduction to Furniture Making 1	

This course picks up where Introduction to Furniture Making 1 leaves off. Students will build a piece of furniture by using the knowledge gained from the first course and building upon it with new techniques and joinery. Students will be encouraged to work more independently, and collaborate with other students using team building skills during parts of the project. Emphasis will be placed on raising quality standards. **Students will be responsible for lumber and hardware fees of \$65.00.**

## 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, but students can chose 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, but 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.**



# 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  
 AT5546 Eng & Invention 1  
 AT5716 Intro Furniture Making 1  
 AT5726 Intro Furniture Making 2  
 AT6226 Small Engines /Power  
 AT6346 Engine Rebuild & Diagnostics

### Spring Only

AT5157 Aviation 1  
 AT5167 Aviation 2  
 AT5537 Engineering Design  
 AT5547 Eng & Invention 1  
 AT5717 Intro Furniture Making 1  
 AT5727 Intro Furniture Making 2  
 AT6227 Small Engines /Power  
 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 (AS120)  
 AT5536 Engineering Design  
 AT9216 Architectural Engineering Design 1  
 AT9316 Architectural Engineering Design 2  
 AT5546 Engineering & Invention 1  
 AT5716 Intro Furniture Making 1  
 AT5726 Intro Furniture Making 2  
 AT6226 Small Engines /Power  
 AT6346 Engine Rebuild & Diagnostics

### Spring Only

AT5157 Aviation 1  
 AT5167 Aviation 2  
 AT5177 Drones: UAS  
 AT5217 Principles of Aeronautical Science (AS120)  
 AT5537 Engineering Design  
 AT9217 Architectural Engineering Design 1  
 AT9317 Architectural Engineering Design 2  
 AT5547 Engineering & Invention 1  
 AT5717 Intro Furniture Making 1  
 AT5727 Intro Furniture Making 2  
 AT6227 Small Engines /Power  
 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  
 AT4311/2 Industrial & Related Occupations I  
 AT4321/2 Industrial & Related Occupations II  
 AT4411/2 Work Exp IRO 1  
 AT4421/2 Work Exp IRO 2

### Fall Only

AT5171 Drones: UAS  
 AT5211 Principles of Aeronautical Science (AS120)  
 AT5911 Car Care Essentials  
 AT5531 Engineering Design  
 AT5541 Engineering & Invention 1  
 AT6411 Engineering & Invention 2  
 AT8531 Advanced Engineering Design  
 AT9211 Architectural Engineering Design 1  
 AT9311 Architectural Engineering Design 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 (AS120)  
 AT5912 Car Care Essentials  
 AT5532 Engineering Design  
 AT5542 Engineering & Invention 1  
 AT6412 Engineering & Invention 2  
 AT8532 Advanced Engineering Design  
 AT9212 Architectural Engineering Design 1  
 AT9312 Architectural Engineering Design 2  
 AT5712 Intro Furniture Making 1  
 AT5722 Intro Furniture Making 2  
 AT5222 Home Maintenance and Repair  
 AT6352 Automotive Engineering & Fabrication

### Fall or Spring

AT5571/2 Career Internship