



Technology & Engineering



Possible Sequences for Technology & Engineering

	Grade 9	Grade 10	Grade 11	Grade 12
	Foundations of Technology	Foundations of Technology		
Graphics:	Graphic Arts 1	Graphic Arts 1	Graphics 1, 2*	Graphics 1, 2*
Automotive:	Energy & Transportation Systems (Power Sports & Equipment) Auto Maintenance	Energy & Transportation Systems (Power Sports & Equipment) Auto Maintenance		
Woods and Metals:	Woodworking Design & Manufacturing 1	Woodworking Design & Manufacturing 2*	Intro to Precision Machining Advanced Precision Machining*	Intro to Precision Machining Advanced Precision Machining*
Electronics:	Intro to Electronics	Intro to Electronics	Intro to Electronics	Intro to Electronics
Engineering:	Intro to AutoCAD Intro to Engineering and Design Civil Engineering and Architecture	Intro to AutoCAD Intro to Engineering and Design Civil Engineering and Architecture	Intro to AutoCAD Civil Engineering and Architecture Intro to Engineering and Design Principles of Engineering Computer Integrated Manufacturing	Intro to AutoCAD Civil Engineering and Architecture Intro to Engineering and Design Principles of Engineering Computer Integrated

AUTOMOTIVE MAINTENANCE

Grade 9-10

1 semester

Prerequisite: None

Do you plan on owning a car? This course is designed to introduce students to the basic operation and maintenance of the automobile. Topics covered will be beneficial to ALL current and future car owners, **both male and female**, and will provide students with the skills necessary for owning and maintaining a car. This course will include classroom demonstrations and lab activities including oil changes, under the hood inspections, under the car inspections, changing and rotating tires, replacement of essential maintenance parts on an automobile, and how to properly care for your vehicle. **This is the first step to owning a vehicle.**

ENERGY AND TRANSPORTATION SYSTEMS (POWER SPORTS AND EQUIPMENT)

Grades 9-10

1 semester

Prerequisite: None

Imagine having the ability to completely disassemble and reassemble a running engine! This course introduces students to small internal combustion engines. After taking this course, students will also be able to troubleshoot and diagnose engine problems. Students will explore all applications of small engines including lawnmowers, snow blowers, snowmobiles, atvs, and watercrafts.

FOUNDATIONS OF TECHNOLOGY

Grades 9-10

1 semester

Prerequisite: None

Don't know what **Technology & Engineering** course to take, look no further... Foundations of Technology is for **YOU!** This course is designed to introduce you to woods, metals, autos, small engines, electronics, graphics, CAD, architecture, and engineering. The curriculum is lab-based where students will learn the essentials hands on. This class will give you the opportunity to better understand all of our courses and help you decide what your **NEXT** Technology & Engineering elective course to sign up for.

GRAPHIC ARTS 1

Grades 9-12

1 semester

Prerequisite: None

Graphic Arts I will provide students with opportunity to create, design, and produce ideas using computer software. Students will be introduced to one of the newest versions of PHOTOSHOP. This software deals with creating, editing, and manipulating photos to design professional real-world projects. ILLUSTRATOR software will also be explored as vector imaging is a large part of the advertising/marketing industry. Students will become experienced in photography, glass etching (sandblasting), t-shirt design, vinyl (decal) production and sublimation production; creating mouse pads, lanyards, apparel, and other interesting real world projects in the production lab.

GRAPHIC ARTS 2

Grades 11-12

1 semester

Prerequisite: Graphic Arts 1

Upon completing the required prerequisite – Graphics I, students will expand their knowledge in the areas of electronic publishing, offset printing, screen printing, vinyl production, and heat seal printing. An emphasis will be placed on electronic image assembly and output including the use of a digital camera. Students will also design and print multi-color projects for professional display and distribution. Career opportunities in this field will also be explored.



INTRODUCTION TO ELECTRONICS

Grades: 9-12

1 semester

Prerequisite: None

This course introduces students to basic electronic theories, components, circuits, test equipment, and wiring techniques. Multiple hands-on projects with circuits and testing is also used. Direct Current theory is introduced along with an introduction to alternating current. Students will also have a basic understanding of house wiring and will construct basic house wiring projects.

INTRODUCTION TO COMPUTER AIDED DRAFTING - AutoCAD

Grades 9-12

1 semester

Prerequisite: None

This class is an introductory course in computer-aided drafting and design. This course will provide the opportunity for the student to become familiar with computer hardware and AutoCAD, an Architectural/Engineering software. At first, students will create basic design drawings, and then move to more elaborate design drawings that consist of multiple parts. Towards the conclusion of the course, students will also learn how to use Autodesk Inventor, a 3-dimensional solid modeling software.

INTRODUCTION TO PRECISION MACHINING (DUAL CREDIT)

Grades 11-12

full year

Prerequisite: None

Designed for students with little background in the use of metal-working machine tools. Basic principles and operations on the engine lathe, vertical milling machine, surface grinder and precision measurement. **(DUAL CREDIT with College of DuPage, Manufacturing 1151 Machine Shop I)**

ADVANCED PRECISION MACHINING

Grades 11-12

full year

Prerequisite: "C" or better in Engineering and Precision Machining Technology 1

An introduction to CNC (Computer Numerical Control) machinery as it applies to the operator and programmer. Introduction to CNC programming coding, set-up, tooling, operation, and troubleshooting. Basic principles and applications of numerically controlled equipment and the setup and operation of CNC machines.

WOODWORKING DESIGN & MANUFACTURING 1

Grades 9-10

1 semester

Prerequisite: None

How many students can say that they learned to operate a CNC or Laser Machine? Woodworking Design & Manufacturing 1 is a LAB BASED course where students will learn how to safely operate all of the tools & equipment in Lake Park High Schools Wood Shop including the Shop Bot & Laser. Students will be able to design and operate the CNC & Laser machine to create their own custom projects. Students will also explore cabinet making where every student will build a nightstand cabinet to take home. Students will be exposed to several areas of the manufacturing world through several class projects in this course.

WOODWORKING DESIGN & MANUFACTURING 2

Grades 9-10

1 semester

Prerequisite: Woodworking Design & Manufacturing 1

Take the next step into the design and manufacturing world! Woodworking Design & Manufacturing 2 is designed to have students apply and expand upon the fabrication processes learned and experienced in Woodworking Design & Manufacturing 1 and utilize those processes in the wood shop. Students will design, create plans, and manufacture a product in the woodworking area. Students will also experience how the manufacturing world operates by participating in a class project built for Lake Park High School. Students will also have the opportunity to further their experience and knowledge using the CNC & Laser Machine by creating and building a project of their choosing.

AP + PLTW SCHOLARS

The College Board and Project Lead the Way (PLTW) recognize the achievements of students who complete course sequences in three career pathways: engineering, biomedical, and computer science. Students who earn qualifying scores on AP exams and PLTW end-of-course exams from prescribed courses earn this distinction, which demonstrates to postsecondary institutions and employers that the student is ready for advanced coursework and has interest in engineering careers. Lake Park recognizes these students as AP + PLTW scholars. Students should follow up with their counselor for more information about the process of earning the AP + PLTW honor.

INTRODUCTION TO ENGINEERING DESIGN (IED) - PROJECT LEAD THE WAY (PLTW)

Grades 9-12

full year

Prerequisite: None

This Project Lead the Way (PLTW) course, Introduction to Engineering Design is an interdisciplinary approach utilizing (Science, Technology, Engineering, and Math) STEM. Emphasis is placed on learning the design process. Students utilize their creativity and collaborate with other students through hands-on projects. The students will develop skills that engineers rely on every day, such as researching, proper engineering documentation with team members, sketching, using state of the art equipment in Autodesk Inventor software. This is used as an opportunity for students to create prototypes and mockups of their work and team solutions.



PRINCIPLES OF ENGINEERING (POE) - PROJECT LEAD THE WAY (PLTW)

Grades 11-12

full year

Prerequisite: None (Introduction to Engineering is recommended)

This Project Lead the Way (PLTW) course, is an interdisciplinary approach utilizing STEM (Science, Technology, Engineering, and Math). The course exposes students to some of the major concepts that they will encounter in a postsecondary engineering course of study. Students have the opportunity to investigate engineering and high tech careers. POE gives students the opportunity to develop skills and understanding of course concepts through group projects and activities. Students will be able to program automated machines/robots they build and design. Students will learn about and create Gear Trains and Pulley systems. Students will assess strengths and weaknesses within building materials.

COMPUTER INTEGRATED MANUFACTURING (CIM) - PROJECT LEAD THE WAY (PLTW)

Grades 11-12

full year

Prerequisite: None (Introduction to Engineering is recommended)

The course explores manufacturing history, individual processes, systems, and careers. In addition to technical concepts, the course incorporates finance, ethics, and engineering design. This reflects an integrated approach that leading manufacturers have adopted to improve safety, quality, and efficiency. Students will be using large automated manufacturing machines (CNC machines) and robots.

PROJECT LEAD THE WAY (PLTW) – CIVIL ENGINEERING AND ARCHITECTURE (CEA)

Grades 9-12

full year

Prerequisite: None

Civil Engineering and Architecture (CEA) is a high school specialization course in the PLTW Engineering Program. Students will learn the fundamentals of building design, site design, and development. They apply Science, Technology, Engineering, Artistic Design and Math to design both residential and commercial projects using REVIT 3D software.