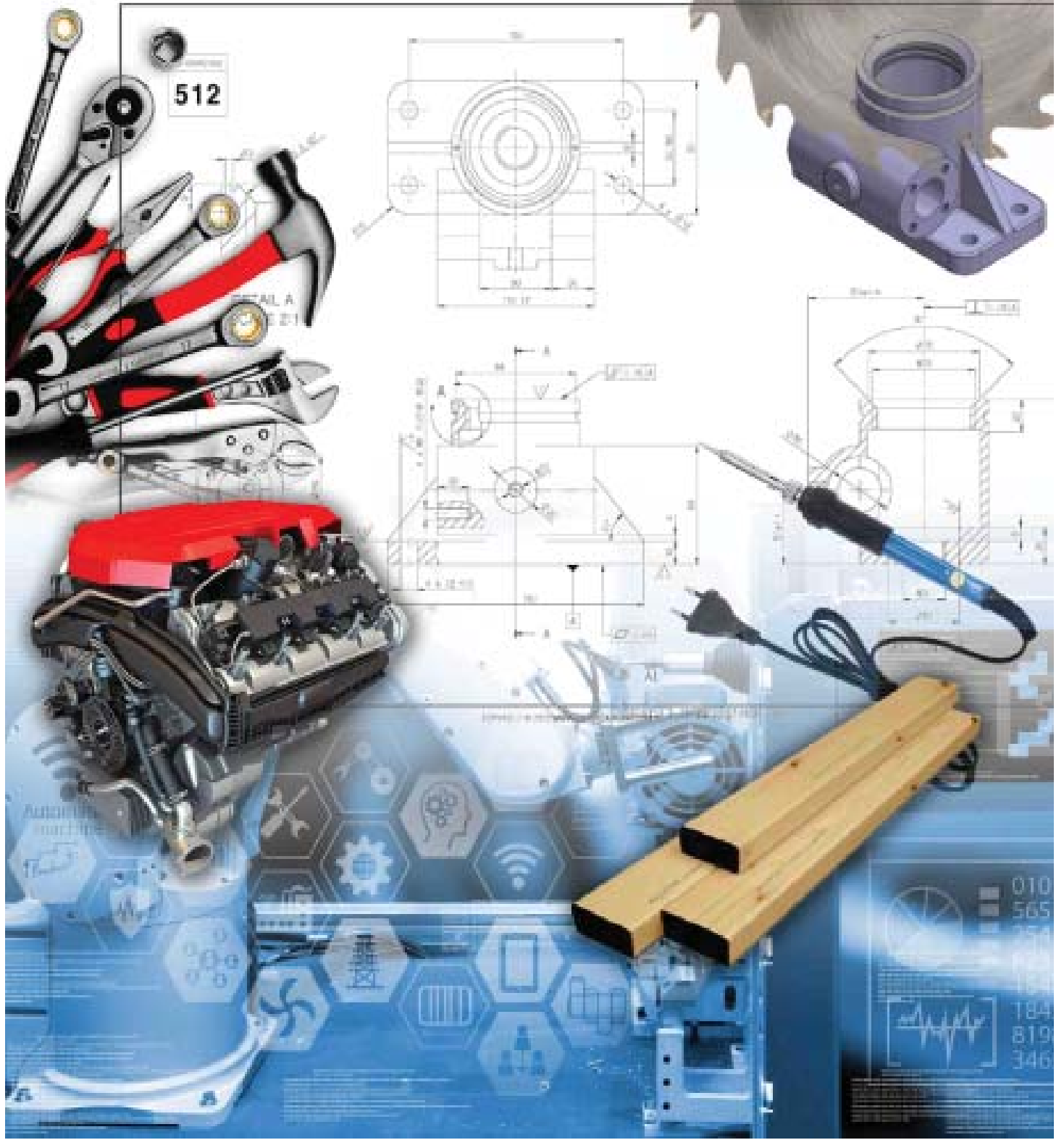
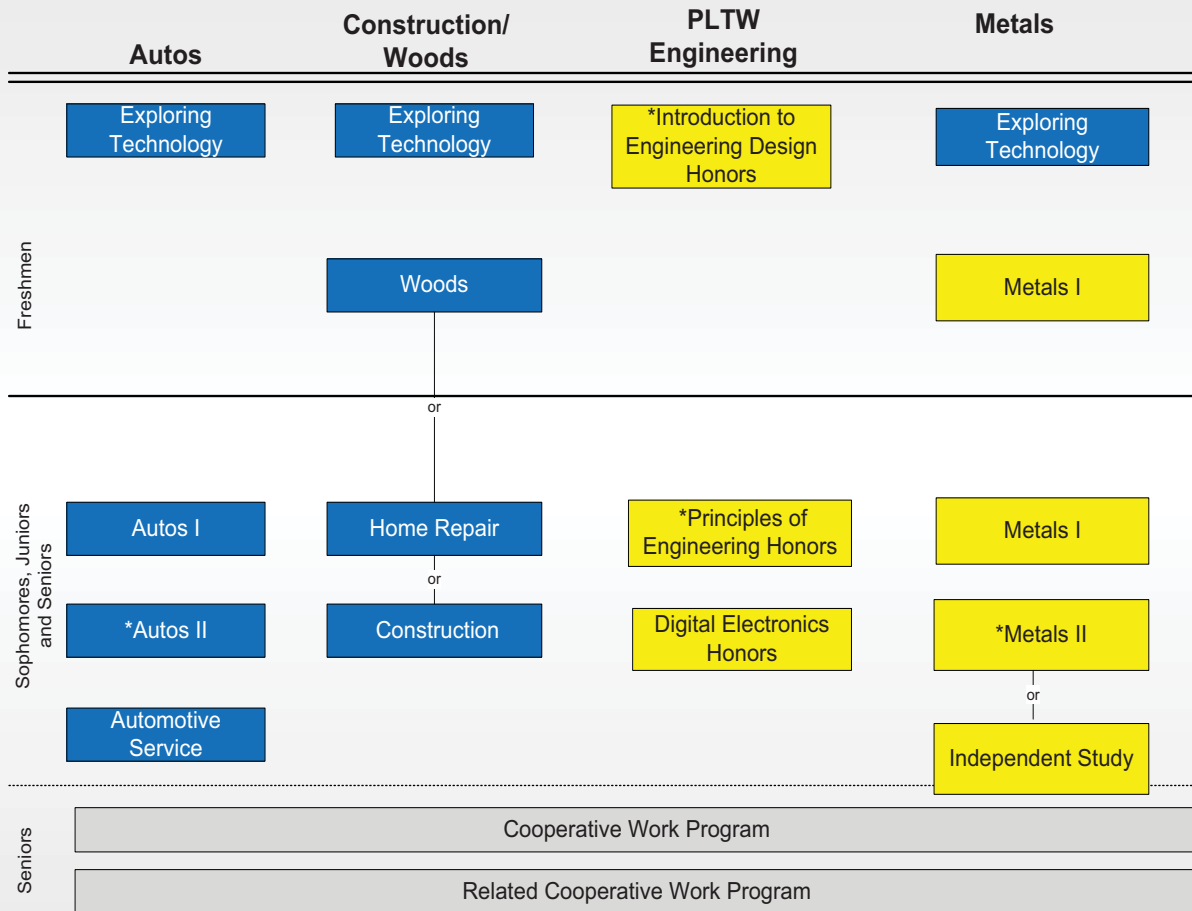


# INDUSTRIAL TECH



# Industrial Technology 2023-2024



\*indicates "Dual Credit"

## INDUSTRIAL TECHNOLOGY

**Mr. Mike Matticks, Chairperson**  
**(847) 451-3052 or**  
**(847) 451-3112**  
**mmatticks@leyden212.org**

The Industrial Technology curriculum provides opportunities for students to learn about modern technical practices, industrial organizations, and the role of technology in our society. Students are encouraged to explore several courses, specialize in a specific course area, and ultimately participate in the school/industry cooperative work program.

Project Lead the Way (PLTW) is a hands-on, project-based engineering curriculum for high school and middle school students. PLTW empowers students to develop and apply in-demand, transportable skills by exploring real-world challenges. Through our pathways in engineering, students not only learn technical skills but also learn to solve problems, think critically and creatively, communicate, and collaborate. PLTW courses are currently being taught in all 50 states in over 9,000 schools.

### EXPLORING TECHNOLOGY

IND 100

Elective: Grades 9, 10, 11, 12      One-Half Credit  
Prerequisite: None  
Grade Weight: College Prep

Exploring Technology is an introductory course that is recommended for students interested in any area of technology. This is a hands-on class that offers a variety of projects that cover the resources, technical processes, and industrial applications across a variety of different industries. Students may take up to two semesters of this course. Each semester covers fundamental aspects of the automotive, construction, woods, metals, and engineering fields as well as the occupations encompassed by those fields. Students will complete a variety of units and projects spanning those fields.

### AUTOS I

IND 221, 222, 223

Elective: Grades 10, 11, 12      One Credit  
Prerequisite: None  
Grade Weight: College Prep

This class is designed to give the student an introductory look at the automobile and the automotive industry. Basic automotive systems and operations are discussed. Students gain hands-on experience in the lab and will begin to develop diagnosis and repair skills. Instructional units include: automotive measurement, fastener types, all automotive fluid services, engine rebuilding, tire installation, balancing, and repairs, and general vehicle maintenance.

### AUTOS II ☼

IND 321, 322, 323

Elective: Grades 10, 11, 12      One Credit  
Prerequisite: Autos I  
Grade Weight: College Prep

Students will get an in-depth look into the different systems found on today's cars. These systems include: engine performance, automotive electrical systems, exhaust and emission control, steering and suspension, fuel systems, cooling systems, brake systems, computerized diagnostics, modern vehicle servicing, and diagnostics. The theory and operation of each system is discussed and the student will have the opportunity to gain hands-on experience in the shop. Upon completion of the class, the student will be able to identify, diagnose, and repair problems found in each of the different systems. Students will have the opportunity to earn an ASE student certification.

### AUTOMOTIVE SERVICE ☼

IND 351, 352, 353

Elective: Grades 11, 12      One-Half Credit or  
One Credit

Prerequisite: Autos I & Autos II (or concurrent enrollment and Autos II or Instructor Approval)

Grade Weight: College Prep

Students will learn the skills that are fundamental to working at an automotive repair facility. They will develop these skills by vehicle service work on actual cars brought to the shop for repairs. This work will include oil changes, fluid checks, tire repair and rotation, general maintenance procedures, testing and diagnostics, and light duty repairs. This class is designed for the student that is considering a career in the automotive repair industry.

### INTRODUCTION TO ENGINEERING DESIGN

#### HONORS ☼

(PLTW)

IND 121, 122, 123

Elective: Grades 9, 10, 11, 12      One Credit  
Prerequisite: None  
Grade Weight: Honors

Students will learn principles of engineering design. The major focus of this course is to expose students to a design development process, analysis, teamwork, communication, global impacts, engineering standards, and technical documentation. IED gives students the opportunity to develop skills through activity, project, and problem-based (APPB) learning. APPB-learning challenges students to continually hone their understanding of the design process. It also allows students to develop, analyze, and test product solutions. This is a dual credit course. Students can receive college credit for successful completion of this course and is eligible to earn Honors grade weight.

## **PRINCIPLES OF ENGINEERING HONORS ☼**

(PLTW)

IND 381, 382, 383

Elective: Grades 10,11,12 One Credit

Prerequisite: None

Grade Weight: Honors

Principles of Engineering is designed to help students understand career possibilities in engineering and engineering technology. Exploring engineering systems and manufacturing processes. Students typically explore how engineers use various technology systems and manufacturing processes to solve problems. In addition, students will learn how engineers address concerns about the social and political consequences created by technological change.

This is a dual credit course. Students can receive college credit for successful completion of this course and is eligible to earn Honors grade weight.

## **DIGITAL ELECTRONICS HONORS ☼**

(PLTW)

IND 281, 282, 283

Elective: Grades 10,11,12 One Credit

Prerequisite: None

Grade Weight: Honors

Digital circuits are found in computers, watches, calculators, musical instruments, video games, and thousands of other devices. This course provides a foundation for students who are interested in electrical engineering, electronics, or the development of electronic circuits and devices. Students study topics that include combinational and sequential logic and are exposed to circuit design tools used in industry, including logic gates, integrated circuits, and programmable logic devices. Students may receive college credit for successful completion of this course and cumulative exam.

## **WOODS**

IND 160

Elective: Grades 9, 10, 11, 12 One-Half Credit

Prerequisite: None

Grade Weight: College Prep

Students have the opportunity to develop skills and knowledge in the field of woodworking. Instruction includes safety practices in using hand tools and power equipment, and materials commonly used in manufacturing and millwork industries. Students learn about the processes involved in construction projects and may engage in a variety of small projects.

## **HOME REPAIR**

IND 270

Elective: Grades 10, 11, 12 One-Half Credit

Prerequisite: None

Grade Weight: College Prep

Students explore a variety of topics related to home repair through a hands-on approach. Students are instructed in areas of safety, including hand tools and power tools, common home repair projects. Students develop a basic understanding of household electrical

systems, plumbing systems, flooring, wall framing, and finishing through do-it-yourself quick fixes.

## **CONSTRUCTION**

IND 291, 292, 293

Elective: Grades 10, 11, 12 One Credit

Prerequisite: None

Grade Weight: College Prep

Through hands-on experience, students will develop some of the skills that are used in the rough and finish construction trades. They will learn the proper and safe use of hand and power tools which are commonly used in these trades. Instruction includes safety principles and practices, recognition of standard lumber sizes, foundation layout methods, building concepts and procedures, as well as framing, masonry, roofing, plumbing, electrical, door and window installation, flooring installation, and trim work.

## **METALS I**

IND 171, 172, 173

Elective: Grades 9, 10, 11, 12 One Credit

Prerequisite: None

Grade Weight: College Prep

Safe operation of basic metalworking machines is stressed including engine lathes, milling machines, precision surface grinders, and other equipment. Students learn the basics of blueprint reading, precision measuring, layout, and machining process planning to produce metalwork projects. Students have the opportunity to apply these skills to attain industry recognized NIMS credentials.

## **METALS II ☼**

IND 181, 182, 183

Elective: Grades 10, 11, 12 One Credit

Prerequisite: Metals I

Grade Weight: College Prep / Honors

Students prepare for entry-level jobs in manufacturing. This class features instruction in advanced and complex manual machine setups. Students also explore the use of computer and numerical controlled (CNC) machining. Students will also use advanced inspection equipment to check tolerances of final products. Students have the opportunity to apply these skills to attain industry recognized NIMS credentials. This is a dual credit course. Students can receive college credit for successful completion of this course and is eligible to earn Honors grade weight.

## **COOPERATIVE WORK PROGRAM**

COOP 611, 612, 613

Elective: Grade 12 One Credit

Prerequisite: One credit in Business, Family and Consumer Sciences, and/or Industrial Technology

Grade Weight: College Prep

This is a two-course program. Students must enroll in Cooperative Work Program and Related Cooperative Work Program concurrently. Co-op assists students as they prepare for various careers. Classroom

instruction focuses on providing students with job survival skills and career exploration skills related to the job and improving students' abilities to interact positively with others. The course content includes the following broad areas of emphasis: further career education opportunities, planning for the future, job-seeking skills, personal development, human relationships, legal protection and responsibilities, economics and the job, organizations, and job termination.

## RELATED COOPERATIVE WORK PROGRAM

COOP 621, 622, 623

Elective: Grade 12 One Credit

Prerequisite: One credit in Business, Family and Consumer Sciences, and/or Industrial Technology

Grade Weight: College Prep

This is a two-course program. **Students must enroll in Cooperative Work Program and Related Cooperative Work Program concurrently.** This related portion of the cooperative work course gives students the opportunity to gain real world work experience. Students may engage in a paid or volunteer position at an approved worksite. Students receive high school credit for on-the-job experiences. Some students are granted an early dismissal. A program coordinator will help guide the student and his/her supervisor through the program. Students who are interested in a career in cosmetology may choose to enroll in Ms. Robert's Academy. There is an additional charge for this program. Contact the Director of Careers & Community Outreach ([fholtouse@leyden212.org](mailto:fholtouse@leyden212.org)) for additional information.

## INDUSTRIAL TECHNOLOGY

### Independent Study

Woods II

IND 170

Grades: 10, 11, 12 One-half Credit

Prerequisite: Instructor approval/introductory course in the specific pathway.

Metals III

IND 191,192,193

Grades: 11, 12 One Credit

Prerequisite: Instructor approval/introductory course in the specific pathway.

Construction II

IND 301,302,303

Grades: 11, 12 One Credit

Prerequisite: Instructor approval/introductory course in the specific pathway.

Engineering Design & Development (EDD)

IND 481,482,483

Grades: 11, 12 One Credit

Prerequisite: Instructor approval/IED,POE,DE (EDD can be taken concurrently with DE if student is a Senior)

Independent Study

IND 900

Grades: 11, 12

One Credit

Prerequisite: Instructor approval/introductory course in the specific pathway.

Grade Weight: College Prep

This course is intended as an enhancement opportunity for students to expand their level of expertise in their Industrial Technology area of choice. Students who wish to pursue an independent study in any area must attain instructor approval prior to registration. Students will coordinate with the supervising instructor to determine a pathway/projects for students to work towards to enhance their current knowledge/skills in that area.