

## **INDUSTRIAL TECHNOLOGY DEPARTMENTAL CURRICULUM PROFILE**

### **PROGRAM DESCRIPTION**

The Lyons-Decatur Industrial Technology program offers students a wide variety of options and opportunities to become involved in Industrial Technology. With several introductory and exploratory courses, such as: IT 7, IT 8 and Tech Ed I, students have the opportunity to experience each of the four areas of Industrial Technology. Also, students can choose from many different courses, such as: Construction, Drafting, Energy, Power & Transportation, Small Engines, Electricity, Alternative Energy and Architectural Drawing, if they choose to further their education in any one particular area.

### **PHILOSOPHY**

The philosophy of the Lyons-Decatur Industrial Technology Department is to provide students with experience in a wide variety of Industrial Technology related career fields. Students will experience a hands-on approach to learning allowing them to enhance problem solving and critical thinking skills.

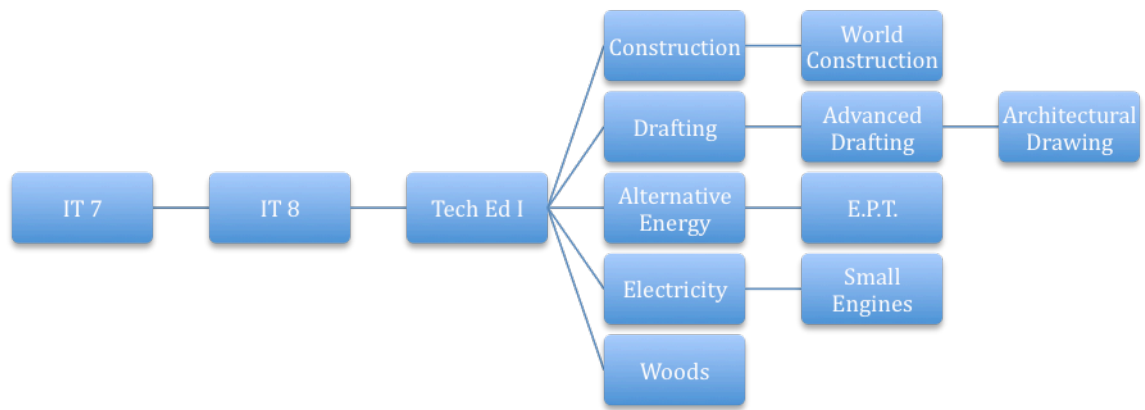
It is our philosophy to merely facilitate learning through hands-on learning and guided practice.

### **OBJECTIVES IN THE INDUSTRIAL TECHNOLOGY PROGRAM**

Upon completion of courses in the Industrial Technology program, students will be able to:

- Define Industrial Technology.
- List and describe the five steps of the design process.
- Label and discuss the Universal Systems Model.
- Safely and correctly use various hand and power tools.
- Properly maintain and adjust equipment in the lab.
- Discuss the importance of safety in the workplace.
- Accurately read and transfer dimensions using a tape measure.
- Create detailed plans for various projects.
- Write a detailed plan of procedure.
- Effectively use resources to solve basic problems in design and engineering.
- Work cooperatively in groups in various problem-solving activities.
- List the six career clusters.
- List and describe the four areas in the Industrial, Manufacturing and Engineering Systems cluster.
- List careers in each of the areas in the IMES cluster.
- Describe the benefits of mass production.
- Use jigs and fixtures in the manufacturing of a product.
- Utilize critical thinking skills to formulate a solution to a given problem.

**COURSE SEQUENCE**



## **Industrial Technology Course Descriptions**

### **Drafting**

Length: Semester

Grade Levels: 10-12

Description: Drafting is a course for students concentrating on the communications area of technology. Students will learn to use the AutoCAD program while making detailed plans. A majority of the class will concentrate on technical drawing. Students will be required to make three-view drawings of 3D objects, place dimensions on drawings, as well as create section and auxiliary views. Students will also learn to make plans and 3D renderings of parts as would be used in the manufacturing industry.

### **Advanced Drafting**

Length: Semester

Grade Levels: 10-12

Description: Advanced drafting is a course for students concentrating on the communications area of technology. Students will learn to use the Inventor while making detailed plans. A majority of the class will concentrate on technical drawing. Students will learn to make plans and 3D renderings of parts as would be used in the manufacturing industry. Students will also create 3D animations, assemblies and assembly plans.

### **Electricity**

Length: Semester

Grade Levels: 11-12

Description: Electricity is a semester long course designed to introduce students to the world of electronics and electricity. Students will be introduced to the fundamental theories of electricity. Basic electrical concepts in physics, mechanics and chemistry will also be introduced. Ohm's Law will be analyzed and used to calculate various aspects of a circuit. Students will also see these theories in practice through experiments and lab activities. Students will also spend a portion of the semester learning the basic principles of residential wiring. Electrical codes and common wiring practices will be followed. Lab activities will be completed to reinforce these principles.

### **Construction**

Length: Year

Grade Levels: 10-12

Description: Construction is a class offered for students as an in depth course in the construction area of technology. Students will learn the fundamentals of construction and the various processes involved. Some of the processes they will learn are: concrete placement, wall framing, roof framing, stair framing, sheathing, sheetrock, vinyl siding, roofing, and finish work. Students will be able to practice these techniques on hands-on projects and on actual construction projects that vary with availability. Throughout the course of this class students will complete a variety of different assignments. Hands-on projects will be used to reinforce most concepts. Students can expect to complete projects such as a career report, safety plan, planning and estimating, construction project bids, and basic construction activities.

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**World Construction**

Length: Year

Grade Levels: 10-12

Description: Construction is a class offered for students as an in depth course in the construction area of technology. Students will learn the fundamentals of construction and the various processes involved. Some of the processes they will learn are: concrete placement, wall framing, roof framing, stair framing, sheathing, sheetrock, vinyl siding, roofing, and finish work. Students will be able to practice these techniques on hands-on projects and on actual construction projects that vary with availability. Throughout the course of this class students will complete a variety of different assignments. Hands-on projects will be used as much as possible. Students can expect to complete projects such as a career report, safety plan, planning and estimating, construction project bids, and basic construction activities.

**Tech Ed I**

Length: Year

Grade Levels: 9-10

Description: Tech Ed I is a survey course for students to experience all four areas of technology. Nine weeks will be spent in each of the four areas of technology which will aid students in deciding in they would like to take another course specializing in that area. Students will also learn the safe and proper usage of power tools. Problem solving and critical thinking activities account for a large portion of the in-class activities. Some activities students can expect to complete in this course are: solar hot dog cookers, model bridges, CO<sub>2</sub> cars, water rockets, problem solving activities, and precision measurement.

**Small Engines**

Length: Semester

Grade Levels: 10-12

Description: Small Engines is a class that provides students with the opportunity to learn more about the transportation area of technology. In this class, students will learn, the importance of the engine to society, basic small engine theory for both four-stroke and two-stroke engines, as well as identify small engine parts and their purpose. Students will also get the opportunity to participate in hands on learning by completing an overhaul of a small engine. After completion students will be able to perform small engine repair as well as troubleshoot problems.

**Architectural Drawing**

Length: Semester

Grade Levels: 10-12

Description: Architectural Drawing is a class that provides students the opportunity to learn the basics of architecture and construction. Students will learn the basics of construction including, foundations, wall framing, roof framing, wall coverings and interior finishes in order to gain a base knowledge of how structures are built. Students will also learn the basics of design and architecture as well as how to create a complete set of plans for a residential structure. During this process, students will also learn the architectural commands of the AutoCAD program and how to use it to create drawings.

**Woods**

Length: Year

Grade Levels: 10-12

Description: Woods is a class offered to students interested in creating projects using wood as a primary building material. Students will learn the safe usage of many different woodworking tools as well as different woodworking methods and practices. The students will be required to make plans, materials lists, and plan of procedures. Also, the students will be required to document the project and create a portfolio of work created. Projects must be submitted for approval before beginning planning.

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**Robotics**

Length: Semester

Grade Levels: 10-12

Description: Robotics is a class offered to students interested in learning the basics of robot construction and programming. The class will utilize VEX robotics kits as teaching tools to learn the different aspects of programming a robot. Students will learn how to create a user controlled robot as well as programming an autonomous robot. Students will build both assigned robots to specs, as well as designing their own robots to solve different problems and accomplish different tasks. Throughout the course students will also learn basic robot construction items such as: gear ratios, levers, pulleys, power transmission, etc.