

TECHNOLOGY AND ENGINEERING EDUCATION

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The Technology & Engineering Education Department believes that education is a process of life-long learning for all students. Technology Education works best when the school community shares in the responsibility and participates in the Technology Education program. Technology Education is a rapidly changing school curriculum of hands-on learning activities. The Technology & Engineering Education Department's courses and curriculum provide students with learning and activities focused on the five areas of technology: manufacturing, communication, transportation, energy and power, and construction.

All TEE courses require a material and/or workbook fee.

TEE COURSE LISTINGS

MANUFACTURING AND CONSTRUCTION TECHNOLOGY

COURSE#	TITLE	LEVEL	PREREQUISITE
TEE1001	Engineering* Technology 1	Sem. 9-12	None
TEE1002	Engineering* Technology 2	Sem. 9-12	Engineering Technology 1
TEE1003	Woods Fabrication 1	Yr. 10-12	None
TEE2001	Woods Fabrication 2	Yr. 11-12	Woods Fabrication 1
TEE2002	Introduction to Construction	Sem. 10-12	None
TEE3009B	Construction Trades (3-period block)	Yr. 11-12	Introduction to Construction
TEE4005I	Technology and Engineering Independent Study	Yr. 12	Level 1, 2 or 3 courses in specific area and Instructor approval

COMMUNICATION TECHNOLOGY

COURSE#	TITLE	LEVEL	PREREQUISITE
TEE1001	Engineering Technology 1*	Sem. 9-12	None
TEE1002	Engineering Technology 2*	Sem. 9-12	Engineering Technology 1
TEE2003	Drafting & Design	Yr. 10-12	None
TEE3001D	Architectural Drafting	Yr. 11-12	Drafting & Design
TEE3002	Computer-Aided Drafting & Design	Yr. 11-12	Drafting & Design

TEE COURSE LISTINGS (CONT'D)

TEE1014D	Media Communication & Production 1	Yr. 9-12	None
TEE2007D	Broadcast Journalism & Production 2	Yr. 10-12	Media Communication 1 and Instructor approval
TEE3013	Broadcast Journalism & Production 3	Yr. 11-12	Broadcast Journalism 2 and Instructor approval
TEE4002I	Technology and Engineering Independent Study	Yr. 12	Level 1 and 2 courses in specific area and Instructor approval

TRANSPORTATION TECHNOLOGY

COURSE#	TITLE	LEVEL	PREREQUISITE
TEE1001	Engineering Technology 1*	Sem. 9-12	None
TEE1002	Engineering Technology 2*	Sem. 9-12	Engineering Technology 1
TEE1004	Power Mechanics	Sem. 9-12	None
TEE2005	Automotive Maintenance	Sem. 10-12	None
TEE3003	Automotive Mechanics	Yr. 10-12	Power Mechanics
TEE4001B	Automotive Servicing (2-period block)	Yr. 11-12	Automotive Mechanics and Instructor approval
TEE4003I	Technology and Engineering Independent Study	Yr. 12	Level 1 and I2 courses in specific area and Instructor approval

ENERGY TECHNOLOGY

COURSE#	TITLE	LEVEL	PREREQUISITE
TEE1001	Engineering Technology 1*	Sem. 9-12	None
TEE1002	Engineering Technology 2*	Sem. 9-12	Engineering Technology 1
TEE2006D	Electricity	Yr. 10-12	None
TEE3005	Electronics	Yr. 11-12	Electricity
TEE3007	A+ Computer Repair	Yr. 11-12	Electricity or Instructor approval
TEE3008	Computer Networking	Yr. 11-12	Electricity or Instructor approval
TEE4004I	Technology and Engineering Independent Study	Yr. 12 Yr. 12	Level 1 and 2 courses in specific area and Instructor approval
TEE4004	Professional and Technical Internship	Yr. 12	Instructor approval

*NVHS enrollment limited to freshmen and sophomores only.

TEE COURSE LISTINGS (CONT'D)

PROJECT LEAD THE WAY

COURSE#	TITLE	LEVEL	PREREQUISITE
PLTW2000	Introduction to Engineering Design (IED)	Yr. 9-12	Algebra 1 and appropriate grade-level Science
PLTW2001	Principles of Engineering (POE)	Yr. 10-12	Appropriate grade-level math and science
PLTW2002D	Digital Electronics (DE)	Yr. 10-12	IED, POE or Electricity and appropriate grade-level math and science
PLTW2003	Civil Engineering & Architecture (CEA)	Yr. 10-12	IED, POE, or Drafting & Design, and appropriate grade-level math and science
PLTW2004	Engineering Design & Development (EDD)	Yr. 12	IED or POE, and 1 other PLTW course and appropriate grade-level math and science.

DUAL CREDIT WITH COLLEGE OF DUPAGE (Available for select TEE classes)

Students enrolled in the following courses may apply to earn dual credit with COD. High School students who wish to take the course listed below for dual credit will receive college credit and a COD transcript regardless of whether or not they continue at College of DuPage. These credits may be transferable to other institutions. All dual credit opportunities are pending an agreement between IPSD and COD. To qualify for dual credit, students must complete appropriate applications and placement testing as required by COD. Freshmen are not eligible for dual credit.

COURSE COMPLETED	CREDIT AT COD
Architectural Drafting: Course TEE3001D	Architecture 1101-Basic Architectural Drafting (2 hrs. credit)
Electricity: Course TEE2060D	Electronics Technology 1100 (3 hrs. credit) Electricity & Electronics Fundamentals
Digital Electronics: Course PLTW2002	Electronics Technology 1141 (3 hrs. credit)
Media Communication & Production 1: Course TEE1014D	Motion Picture/Television 1011 (3 hrs. credit)
Broadcast Journalism & Production 2: Course TEE2007D	Motion Picture/Television 1220 (3 hrs. credit)

TECHNOLOGY, EDUCATION AND ENGINEERING (TEE) COURSE DESCRIPTIONS

TEE1001 ENGINEERING TECHNOLOGY 1 *Grade 9-12. One semester.*

The course is designed to use Project-Based Learning (PBL) as the instructional model. Students will be involved in problem-solving investigations and other meaningful tasks that allow them to work in groups and/or autonomously to solve problems by developing realistic products. Master projects drive the direction of the course and the student learning. The projects cover one of several major technology sectors while employing an enterprise process to design, build, and market an invention or idea. The technologies introduced are AC/DC Power, CNC Milling Technology, Communication Technology, Desktop Publishing & Graphics, Electrical Systems, Engineering Team Building, Manufacturing Tools,

Mechanical Systems & Mechanisms, Pneumatics Technology, Quality Control, and Robotics Technology. A lab fee will be charged.

TEE1002 ENGINEERING TECHNOLOGY 2 *Grade 9-12. One semester. Prerequisite is Engineering Technology 1.*

The course is designed to use Project-Based Learning (PBL) as the instructional model. This course builds on skills learned in Engineering Technology I. Students will be involved in problem-solving investigations and other meaningful tasks that allow them to work in groups and/or autonomously to solve problems by developing realistic products. Master projects drive the direction of the course and the student learning. The projects cover one of several major technology sectors while employing an enterprise process to design, build, and market an invention or idea. A lab fee will be charged.

TEE1003 WOODS FABRICATION 1 *Grade 10-12. Year-long.*

This course is the study of manufacturing technology as it applies to the woodworking industry. Students will display the safe operation of hand tools, power tools, and machinery used in industry. Students will learn to read and draw blueprints and manufacture a product from those prints. Basic math and measuring skills will be taught as they apply to the industry. A study of wood products, furniture design, fasteners, wood joints, and finishing processes will be covered. Students will explore possible careers. A lab fee will be charged.

TEE2001 WOODS FABRICATION 2 *Grade 11-12. Year-long. Prerequisite is Woods Fabrication 1.*

This course involves the study of construction and advanced manufacturing technology. Students will be introduced to the processes used to produce blueprints and products. Students will display the safe operation of hand tools and power tools used in the manufacturing industry while completing various projects. Fees are charged for wood and project supplies.

TEE2002 INTRODUCTION TO CONSTRUCTION TRADES *Grade 10-12. One semester.*

This preparatory course is designed for any student interested in learning about construction technology and/or related fields such as architecture, contracting and engineering. The student will develop a background in design, preparation, construction, and maintenance as it relates to a single-family home. Other career opportunities in construction technology will be explored: creating blueprints, surveying, concrete, carpentry, roofing, plumbing, heating and air conditioning, electricity, insulation, siding, drywall, and painting. Safe practices in the use of hand tools and power tools used in the industry will be covered. A lab fee will be charged.

TEE2003 DRAFTING & DESIGN *Grade 10-12. Year-long.*

This is a beginning course for the drafts person or engineering student, introducing him or her to drafting fundamentals. The course covers drafting equipment usage, materials, an introduction to CADD (Computer-Aided Drafting and Design), and techniques used as a means of technical communications. Drafting techniques are studied and drawings are made with emphasis on description through multi-view, pictorial, architectural, and CADD drawings. The course will also focus on product design process and product design cycle. A lab and workbook fee will be charged.

TEE3001D ARCHITECTURAL DRAFTING *Grade 11-12. Year-long. Prerequisite is Drafting and Design.*

This course covers general architectural techniques, history of architecture, home styles, construction methods, planning and drafting layouts, and perspective drawings. The course will also focus on the design process using traditional and CADD techniques to produce a set of residential drawings. The course will be directed both to non-college and college-bound students. A lab and workbook fee will be charged.

TEE3002 COMPUTER-AIDED DRAFTING *Grade 11-12. Year-long. Prerequisite is Drafting and Design.*

This course is designed for engineering students and architectural students using the computer. Auto CAD software will be used. Students will learn to create, store, edit, and plot drawings. They will also learn to set up prototype drawings, create symbol libraries, bills of materials, develop customized screens, and generate 3D models. A lab fee will be charged.

TEE1004 POWER MECHANICS *Grade 9-12. One semester.*

This is an introductory course in the area of gasoline engine operation and fluid power mechanics. The course of study will concentrate on small two- and four-cycle engine operations. In Power Mechanics, students will also disassemble, inspect, and reassemble small gasoline engines and learn about the different types of systems. Students will be introduced to the operations of automotive engines, automotive maintenance, and car design. A lab fee will be charged.

TEE2005 AUTOMOTIVE MAINTENANCE *Grade 10-12. One semester.*

This course is designed for students to gain basic knowledge and skills to maintain automobiles. This course covers the following areas in automotive maintenance: engine tune-up, lubrication maintenance, electrical maintenance, tires and wheels, drive train maintenance, and seasonal maintenance procedures. Lab and workbook fees will be charged.

TEE3003 AUTOMOTIVE MECHANICS *Grade 10-12. Year-long. Prerequisite is Power Mechanics.*

This is a lecture/laboratory course designed primarily to prepare students for job entry or advanced training in automotive service. The students will develop a background in the design, operation, and troubleshooting procedures of the gasoline engine and other related components such as the transmission and drive line, brake, and electrical systems. Also stressed will be the disassembly of engines, identification of parts, use of test equipment and service manual, and shop safety. Laboratory procedures will be covered. Safety glasses are required. Lab and workbook fees will be charged.

TEE4001B AUTOMOTIVE SERVICING *Grade 11-12. Two periods. Year-long. Two credits. Prerequisite is Auto Mechanics and Instructor Approval. Weighted grade.*

This is a lecture/laboratory class designed to give the automotive student an enriched background in automotive suspension, alignment, brakes, tires and wheels, drive line, and engine and electrical systems. The use of tools, test equipment, service manuals, shop safety, and laboratory procedures will be covered. This course requires two consecutive periods. Safety glasses are required. A lab and workbook fee will be charged.

TEE2006D ELECTRICITY *Grade 10-12. Year-long.*

This course is designed to acquaint the student with the fundamental theory behind direct and alternating current electricity, common electronic equipment, and electric circuits. Laboratory practice, discussion, and experiments make up the course. Simple DC and AC electrical components, motors, generators, inductors, and capacitors will be studied and manipulated to show effects of circuit variables. Each student will be required to construct a simple electrical device. Parts for this device may be purchased through the school or any commercial electronics store. A lab fee will be charged.

TEE3005 ELECTRONICS *Grade 11-12. Year-long. Prerequisite is Electricity.*

This course is designed to acquaint the student with fundamentals of electronic communication, amplitude modulation, frequency modulation, receivers, and transmitters. Students are introduced to solid-state circuitry and solid-state electronics through laboratory practice, discussion, and experiments. In this lab, the student will construct an electronic device, the parts for which may be purchased through the school or any commercial electronics store. A lab fee will be charged.

TEE3007 A+ COMPUTER REPAIR *Grade 11-12. Year-long. Prerequisite is Electricity or Instructor Approval.*

Students interested in building and servicing PC computers should be directed to this class. The latest software and hardware will be utilized to teach students to troubleshoot computers and repair or upgrade them as well. Course enrollment will dictate at which District 204 high school the course will be taught.

TEE3008 COMPUTER NETWORKING *Grade 11-12. Year-long. Prerequisite is Electricity or Instructor Approval.*

This course will introduce students to the fundamentals of computer networking through lectures and hands-on labs. Students will gain a basic understanding of how a network is built, maintained, and upgraded. Students will have an

opportunity to program routers, switches, and set up a wireless network. Course enrollment will dictate at which District 204 high school the course will be taught.

TECHNOLOGY & ENGINEERING INDEPENDENT STUDY

TEE4005I MANUFACTURING & CONSTRUCTION

TEE4002I COMMUNICATION

TEE4003I TRANSPORTATION

TEE4004I ENERGY

Grade 12. Prerequisite is completion of Levels 1 and 2 in an area and Instructor approval.

This course is for seniors who have successfully completed level 2 or 3 courses and have the desire to advance in a specific area such as woods, automotive, electronics, drafting, or media. See a teacher in the department for an application. A lab fee will be charged.

TEE3009B CONSTRUCTION TRADES *Grade 11-12. Three periods. Year-long. Off-site. Prerequisite is Intro to Construction. This course is offered through a partnership with Aurora East High School District 131.*

Construction sites will be in the Aurora area. This course is designed to provide students hands-on experience in construction technology and/or related fields such as architecture, general contracting, and engineering. The course will enable students to enter employment and/or further education and training. Construction includes building a single-family home that will be sold to the public upon completion. Other career opportunities in construction technology, such as surveying, concrete, roofing, plumbing, HVAC, electricity, insulation, siding, drywall, and painting are covered during the completion of the project. Areas such as soil testing, waivers and liens, safety, legal liabilities, and sales and marketing will also be covered. This year-long course will meet daily for three class periods and will require the student to provide transportation to and from the site. A lab fee will be charged.

TEE1014D MEDIA COMMUNICATION AND PRODUCTION 1 *Grade 9-12. Year-long.*

This course is a survey of Mass Media designed to provide students an introduction to the various forms of electronic media. Students will be introduced to radio, television, film, broadcast journalism, and other forms of mass media. Through the study of these areas, students will develop media literacy and skills necessary to create and produce in a changing media environment. In addition to media theory, students will learn the technological, operational, and creative aspects of producing for the medium. A lab fee will be charged.

TEE2007D BROADCAST JOURNALISM AND PRODUCTION 2 *Grade 10-12. Year-long. Prerequisite is Media Communication 1.*

In addition to expanding on the curricular units in Media Communication and Production I, students will work in a team-based environment to create advanced content emphasizing visual storytelling and editing technique. Students will learn fundamentals of broadcast journalism and advanced media production. A lab fee will be charged.

TEE3013 BROADCAST JOURNALISM AND PRODUCTION 3 *Grade 11-12. Year-long. Prerequisite is Broadcast Journalism and Production 2 and Instructor Approval.*

This course seeks to further enhance the student's skills and develop media literacy. Students will formally propose and produce various projects throughout the year. Students will also be assigned school-related media productions by their instructor. A lab fee will be charged.

TEE4004 PROFESSIONAL AND TECHNICAL INTERNSHIP *Grade 11-12. Year-long. Two periods. Individualized program. Prerequisite is Instructor Approval.*

This program serves as the capstone in the sequence of Technology and Engineering courses. Sequenced courses include the following: Automotive Servicing, Architectural Drafting, Computer Drafting, Electronics, and Woods 2. Other course sequences may qualify. A student will receive one credit for classroom instruction and one credit for on-the-job-training. The internship instructor will assist with job placement and monitor student progress throughout the year. Early dismissal is not a requirement for this program.

PLTW2000 INTRODUCTION TO ENGINEERING DESIGN (IED) *Grades 9-12. Year-long. Prerequisite is Algebra 1, enrolled concurrently in Geometry and the appropriate grade level science. Weighted grade.*

In this course, students use 3D solid modeling design software to design solutions to proposed problems. Students will learn to document their work and communicate solutions to peers and members of the professional community. The major focus of the IED course is to expose students to the design process, research and analysis, teamwork, communication methods, global and human impacts, engineering standards and technical documentation. A lab fee will be charged.

PLTW2001 PRINCIPALS OF ENGINEERING (POE) *Grades 10-12. Year long. Prerequisite is appropriate grade-level math and science. Weighted grade.*

This survey course of engineering exposes students to some of the major concepts they will encounter in a postsecondary engineering course of study. Students investigate engineering and high-tech careers and develop skills and understanding of course concepts. Students employ engineering and scientific concepts in the solution of engineering design problems. Students learn to document their work and communicate their solutions to peers and members of the professional community. A lab fee will be charged.

PLTW2002D DIGITAL ELECTRONICS (DE) *Grades 10-12. Year-long. Prerequisite is IED, POE, or Electricity and appropriate grade level math and science. Weighted grade.*

This course is the study of electronic circuits that are used to process and control digital signals. Digital electronics is the foundation of all modern electronic devices such as cellular phones, MP3 players, laptop computers, digital cameras and high-definition televisions. The major focus of the DE course is to expose students to the process of combinational and sequential logic design, teamwork, communication methods, engineering standards and technical documentation. A lab fee will be charged.

PLTW2003 CIVIL ENGINEERING & ARCHITECTURE (CEA) *Grades 10-12. Year-long. Prerequisite is IED, POE, or Drafting and Design and appropriate grade level math and science. Weighted grade.*

The major focus of this course is completing long-term civil engineering and architecture projects that involve the development of property sites that involve applying what they learn to the design and development of a property. The course provides teachers and students freedom to develop the property to simulate the experiences of civil engineers and architects. Students work in teams, exploring hands-on activities and projects to learn the characteristics of civil engineering and architecture. In addition, students use 3D design software to design solutions to major course projects. Students learn to document their project, solving problems and communicating their solutions to their peers and members of the professional community of civil engineering and architecture. A lab fee will be charged.

PLTW2004 ENGINEERING DESIGN & DEVELOPMENT (EDD) *Grade 12. Year-long. Prerequisites include a minimum completion of IED or POE, one additional PLTW course, and appropriate grade level math and science. Weighted grade.*

In this capstone course, students work in teams to design and develop an original solution to a valid open-ended technical problem by applying the engineering design process. Students perform research to choose, validate, and justify a technical problem. After carefully defining the problem, teams design, build, and test their solutions while working closely with industry professionals who provide mentoring opportunities. Finally, student teams present and defend their original solution to an outside panel. A lab fee will be charged.