

## Technology and Engineering Education (TEE) Dual Credit With College Of DuPage

Students enrolled in the following courses may apply to earn dual credit with COD. High school students who wish to take the courses 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.

Course Completed at NVHS, WVHS	Credit at COD
➤ Architectural Drafting: Course #4042	➤ Architecture 1101-Basic Architectural Drafting (2 hrs. credit)
➤ Electricity: Course #4060	➤ Electronics Technology 1100 (3 hrs. credit)-Electricity & Electronics Fundamentals
➤ Computer Aided Drafting & Design: Course #4044	➤ Architecture 1211-Basic Computer Aided Drafting-Auto CAD (3 hrs. credit)

## Technology and Engineering Education (TEE)

Paul Holba, Department Chairperson - WVHS

Lisa Traut, Department Chairperson - NVHS

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The Technology Department's courses and curriculum revolve around providing students with learning and activities focused on the five areas of technology: manufacturing, communication, transportation, energy and power, and construction. The majority of Technology and Engineering classes require safety glasses that must be purchased by the student. There are materials fees associated with such classes in Technology and Engineering when students make projects to be taken home upon completion.

## Technology and Engineering (TEE) Course Listings

Manufacturing and Construction Technology			
Course #	Title	Level	Prerequisite
4020	Introduction to Engineering I *	Sem. 9-10	None
4023	Introduction to Engineering II *	Sem. 9-10	Intro to Engineering I or Department Approval
4030	Woods Fabrication I	Yr. 10-12	None
4032	Woods Fabrication II	Yr. 11-12	Woods Fabrication I or Department Approval
4034	Introduction to Construction	Sem. 10-12	None
4070	Construction Trades (3 period block)	Yr. 11-12	Introduction to Construction
Communication Technology			
Course #	Title	Level	Prerequisite
4020	Introduction to Engineering I *	Sem. 9-10	None
4023	Introduction to Engineering II *	Sem. 9-10	Intro to Engineering I or Dept. Approval
4040	Drafting & Design	Yr. 10-12	None
4042	Architectural Drafting	Yr. 11-12	Drafting & Design or Department Approval
4044	Computer Aided Draft. & Design	Yr. 11-12	Drafting & Design or Department Approval
4270	Media Communication & Production I	Yr. 10-12	None
4272	Broadcast Journalism & Production II	Yr. 11-12	Media Communication I and Department Approval
4273	Broadcast Journalism & Production III	Yr. 12	Broadcast Journalism II and Department Approval

Transportation Technology			
Course #	Title	Level	Prerequisite
4020	Introduction to Engineering I *	Sem. 9-10	None
4023	Introduction to Engineering II *	Sem. 9-10	Intro to Engineering or Department Approval
4050	Power Mechanics	Sem. 9-11	None
4052	Automotive Mechanics	Yr. 11-12	Power Mechanics or Auto Maintenance or Department Approval
4054	Automotive Servicing (2 per. block)	Yr. 11-12	B in Auto Mechanics and Department Approval
4058	Auto Maintenance	Sem. 10-12	None
Energy Technology			
Course #	Title	Level	Prerequisite
4020	Introduction to Engineering I *	Sem. 9-10	None
4023	Introduction to Engineering II *	Sem. 9-10	Intro to Engineering I or Dept. Approval
4060	Electricity	Yr. 10-12	None
4062	Electronics	Yr. 11-12	Electricity or Department Approval
4065	A+ Computer Repair	Yr. 11-12	Electricity or Department Approval
4067	Computer Networking	Yr. 11-12	Electricity or Department Approval
4068	Applied Tech Independent Study	Yr. 12	Level I and II courses in specific area and Department Approval
4497	Professional & Technical Internship	Yr. 11-12	As designated by course sequence or approval of internship instructor

\* NVHS Sophomores will have to travel to the Gold Building for this course.

## Technology and Engineering (TEE) Course Descriptions

Technology and Engineering courses are year-long, unless noted.

**4020 Introduction to Engineering I - Grade 9-10. 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. Students are encouraged to register for both IE courses, but have the option of taking the IE II course second semester.

**4023 Introduction to Engineering II - Grade 9-10. One semester. Prerequisite is Introduction to Engineering I or Department Approval.** 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. This course is only offered second semester.

**4030 Woods Fabrication I - 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 trees, wood products, furniture design, fasteners, wood joints, and finishing processes will be covered. Students will explore possible careers. A lab fee will be charged.

**4032 Woods Fabrication II** - *Grade 11-12. Year long. Prerequisite is Woods Fabrication I or Department Approval.* This course involves the study of construction and advanced manufacturing technology. Students will be introduced to CAD (computer-aided drafting) 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.

**4034 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, engineering, and so forth. 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 such as: 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.

**4040 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 CAD (Computer-Aided Design), and techniques used as a means of technical communications. Drafting techniques are studied and drawings are made with emphasis on the concepts of shape and size description through multi-view and pictorial drawings as they are used in mechanical and architectural drawings. A lab fee will be charged.

**4042 Architectural Drafting** - *Grade 11-12. Year long. Prerequisite is Drafting and Design or Department Approval.* This course covers general architectural techniques, history of architecture, home styles, construction methods, planning and drafting layouts, and perspective drawings. The course will be directed both to non-college and college-bound students. A lab fee will be charged.

**4044 Computer Aided Drafting** - *Grade 11-12. Year long. Prerequisite is Drafting and Design or Department Approval.* This course is designed for engineering students and architectural students using the computer. The 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.

**4050 Power Mechanics** - *Grade 9-11. One semester.* This course is an introductory course in the area of gasoline engine operation and fluid power mechanics. The course of study will be divided into approximately 15 weeks of concentration on small two and four-cycle engine operations. In Power Mechanics, students will also disassemble, inspect, and reassemble small gasoline engines and will learn about the different types of systems. Students will also be introduced to the operations of automotive engines, automotive maintenance and car design for 3 weeks. A lab and workbook fee will be charged. SAFETY GLASSES are required.

**4052 Automotive Mechanics** - *Grade 11-12. Year long. Prerequisite is C or better in Power Mechanics or Auto Maintenance or Department Approval.* 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 of the automobile 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, as well as shop safety. Laboratory procedures will be covered. SAFETY GLASSES of the spectacle-type and coveralls are required. Lab and workbook fees will be charged.

**4054 Automotive Servicing** - *Grade 11-12. Two periods, Year long. Two credits. Weighted grade. Prerequisite is "B" or better in Auto Mechanics AND Department Approval.* This is a lecture/laboratory class designed to give the automotive student a deeper and 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.

**4058 Automotive Maintenance** - *Grade 10-12. One semester.* This course is designed for both male and female students of District 204 who wish only to gain some basic knowledge and maintenance skills for maintaining automobiles. This course covers the following areas in automotive maintenance: body maintenance, engine tune-up, lubrication maintenance, electrical maintenance, tires and wheels, drive train maintenance, and seasonal maintenance procedures. Students are not permitted to enroll in this course after completing Auto Mechanics. Lab and workbook fees will be charged.

**4060 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 will be part of 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.

**4062 Electronics** - *Grade 11-12. Year long. Prerequisite is Electricity or Department Approval.* This course is designed to acquaint the student with fundamentals of electronic communication, amplitude modulation, frequency modulation, receivers, and transmitters. Solid-state circuitry and solid-state electronics are also introduced. Laboratory practice, discussion and experiments will be part of the course. In this lab the student will be required to 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.

**4065 A+ Computer Repair** - *Grade 11-12. Year long. Prerequisite is Electricity or Department 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.

**4067 Computer Networking** - *Grade 11-12. Year long. Prerequisite is Electricity or Department 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.

**4068 Technology and Engineering Independent Study** - *Grade 12. Prerequisite is completion of Levels I and II in an area AND Department Approval.* This course is for seniors who have successfully completed level II courses and have the desire to advance in a specific area such as woods, automotive, electronics, or drafting.

**4070 Construction Trades** - *Grade 11-12. Three periods. Year long. Off site. Prerequisite is Intro to Construction.* This course is designed to provide students hands-on experiences in learning about 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, H.V.A.C., electricity, insulation, siding, drywall, and painting will be 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. This course is offered through a partnership with Aurora East High School District 131. Construction sites will be in the Aurora area.

**4270 Media Communication and Production I formerly known as TV Production I** - *Grade 10-12. 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 instructional areas that include radio, television, film, broadcast journalism and other forms of mass media. Through the study of these areas students will gain valuable knowledge in developing media literacy and learn skills necessary to produce and create in a changing media environment. In addition to media theory, students will learn the technological, operational and creative aspects of producing for the medium.

**4272 Broadcast Journalism and Production II formerly known as TV Production II** - *Grade 11-12. Year long. Prerequisite is Media and Communication AND Department Approval.* This course is a skill level course for students who have successfully completed Media and Communication I. In addition to expanding on the activities explained in the first course, students will work in a team-based environment to create a variety of video and audio related productions using industry standard equipment. Students will develop fundamentals of broadcast journalism and advanced production.

**4273 Broadcast Journalism and Production III formerly known as TV Production III** - *Grade 12. Year long. Prerequisite is Broadcast Journalism and Production II AND Department Approval.* This course is designed for seniors who have successfully completed Broadcast Journalism and Production II. It seeks to further enhance 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. Instructor approval is required before registering for this class.

**4497 Professional and Technical Internship** - *Grade 11-12. Year long. Two periods. Individualized program.* This program serves as the last course in a sequence of Technology and Engineering courses. Sequenced courses include the following: Automotive Servicing, Architectural Drafting, Computer Drafting, Electronics, and Woods II. Other course sequences may qualify. Please see instructor or department chair for approval. 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.