

## HIGH SCHOOL TRADE AND INDUSTRIAL EDUCATION COURSE CODES GRADES 7-12

*High school (grades 9-12) courses in Trade and Industrial Education require 150 contact hours per credit.*

Course Code	Course Name	Grade Levels	Description	Accreditation Time/ Credit Options*	License/credential Required**
17006	Technical Studies	7-8	Technical Studies is a comprehensive, integrated, experience-based course in which students learn about technology – its evolution, systems, techniques, utilization, and social and cultural significance. It develops “technological literacy” by dealing with the ways in which ingenuity, process, materials, devices, science, and mathematics are applied for solving problems to meet our needs and desires.	NDAC 67-19-01-34 (2)(b) ♦ may be counted as part of the minimum 200 minutes per week of additional courses	License Code: 17006-Technical Studies ♦ 7-8 <b>OR</b> 10017-Technical Studies ♦ 7-8
17015	Technical Studies I	9-12	This course is a comprehensive, integrated, experience-based course in which students learn about technology – its evolution, systems, techniques, utilization, and social and cultural significance. It develops “technological literacy” by dealing with the ways in which ingenuity, process, materials, devices, science, and mathematics are applied for solving problems to meet our needs and desires.	1/2 or 1	License Code: 17015-Technical Studies ♦ 9-12 <b>OR</b> 10017-Technical Studies 9-12
17016	Technical Studies II	9-12	This course will provide students with the opportunity to expand their knowledge of technological literacy by designing and developing solutions to given problems. Students will gain a greater understanding of the engineering design process as well as mathematics and science principles through project-based, team-oriented activities and projects.	1/2 or 1	
17017	Technical Studies III	9-12	This is an engineering-based course consisting of four major subject areas. The topics that will be covered are: Manufacturing, Energy and Power, Transportation, and Construction. Students will have the opportunity to brainstorm, model, test, and refine their solutions. This course will extend the students technological abilities and expand their critical thinking and problem solving skills.	1/2 or 1	
17018	Technical Studies IV	9-12	This is an engineering-based course consisting of four major subject areas. The topics that will be covered are: Information and Communication, Medical Technology, Agriculture and Biotechnology, and Entertainment and Recreation Technology. Students will have the opportunity to brainstorm, model, test, and refine their solutions. This course will extend the students technological abilities and expand their critical thinking and problem solving skills.	1/2 or 1	

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17030	Auto Collision Technology I	10-12	This is the beginning course for students interested in Auto Body repair. It is part of a sequential series of courses covering repair of damaged bodies, fenders and replacement parts. Students will be introduced to painting preparation and painting methods. This is a prerequisite to Auto Body 2.	1 or 2	License Code: 17031-Auto Collision Technology ◆ 10-12
17031	Auto Collision Technology II  ◆ Prerequisite: 17030 - Auto Collision Technology I	11-12	To prepare students for employment in the auto body occupation. All phases of repairing damaged bodies and fenders including metal straightening by hammering, smoothing areas by filing, grinding or sanding, concealment of imperfections, painting and replacement of body components, including trim. Students completing this sequential course will be eligible for ASE certification as noted in the NATEF guidelines.	2	
17032	Automotive Technology I	10-12	To begin preparation for employment as an ASE certified auto technicians. This sequential course will include topics in vehicle engine, power transmission, steering, brakes, and electrical systems.	1 or 2	License Code: 17032-Automotive Technology ◆ 10-12
17037	Automotive Technology II  ◆ Prerequisite: 17032 - Automotive Technology I	11-12	Continued preparation in vehicle engine, power transmission, steering, brakes and electrical systems will be provided. Included in training is the use of diagnostic and testing equipment and tools used in the repair process. Students completing this sequential course will be prepared to enter college Automotive programs and can become eligible for ASE certification in 3-4 areas as noted by NATEF guidelines.	2	
17038	Automotive General Service Technology I	10-12	The General Service Technology program begins with an orientation to the eight areas of NATEF standardized programming – Engine Repair, Automatic Transmissions, Manual Drive, Suspension and Steering, Brakes, Electrical/Electronic Systems, Heating and Air Conditioning and Engine Performance. This is a sequential course and is a prerequisite to Automotive General Service Technology 2.	1 or 2	

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17039	Automotive General Service Technology II  ◆ Prerequisite: 17038 - Automotive General Service Technology I	11-12	The second year General Service Technology program consists of a two-hour course continuing orientation to Engine Repair, Automatic Transmissions, Manual Drive, Suspension and Steering, Brakes, Electrical/Electronic Systems, Heating and Air Conditioning and Engine Performance. Students must complete the Electrical/Electronic Systems standard to pass complete the course. Automotive General Service Technology is a preparatory program to enter college Automotive Technology and does prepare students to be eligible for ASE certification.	2	License Code: 17032-Automotive Technology ◆ 10-12
17035	Parts Merchandising & Management	10-12	Students will gain knowledge and skills that will enable them to recognize various parts, fill out sales receipts, and collect payments or file the charges on the customer's account. The student will become familiar with the needs of the customer and learn how to stock and merchandise the latest parts to meet their needs. Parts Merchandisers are found in occupational settings such as automotive dealerships, retail parts stores, wholesale distributors and others. Students will become aware of occupational and advanced training opportunities in Parts Merchandising.	1 - 2	License Code: 17035-Parts Merchandising & Management ◆ 10-12
17040	Diesel Technology	10-12	The student will gain an understanding of all various types of diesel engines, information, and actual experience in how to disassemble and reassemble an engine, basic parts operation, and service. Experiences will be gained in troubleshooting, rebuilding, and tuning different types of diesel engines. Students will become aware of occupational and advanced training opportunities in diesel technology.	1 - 4	License Code: 17040-Diesel Technology ◆ 10-12
17050	Culinary Arts I	10-12	Culinary Arts 1 introduces students to the occupation concerned with preparation and service of food. Contents may include: opportunities in the food service industry, career maturity skills, safety and sanitation, organization of food preparation, menu planning and recipe selection and food purchasing. This course is a prerequisite to Culinary Arts 2.	1 or 2	License Code: 17050-Culinary Arts ◆ 10-12
17051	Culinary Arts II  ◆ Prerequisite: 17050-Culinary Arts I	11-12	Culinary Arts 2 continues training for the occupation of food service and additionally includes topics on financial management, current issues in food service, legislation affecting the industry and its workers and career maturity skills. The Culinary Arts program prepares students for college programs in food service.	2	

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17072	Commercial Art I	10-12	Commercial Art introduces students to the skills required to become a commercial artist. Application of art to the design of commercial products for the purpose of decorative, aesthetic effects and current styling will be introduced. Software applications will be introduced so students are able to develop products electronically. The Commercial Art course is a prerequisite to Commercial Art 2.	1 or 2	License Code: 17073-Commercial Art ◆ 10-12
17073	Commercial Art II ◆ Prerequisite: 17072 - Commercial Art I	11-12	Commercial Art 2 continues skill development in design and aesthetic affects of products. Advanced software applications and training is incorporated. The course also includes orientation to production methods and product knowledge. The Commercial Art program prepares students to enter college commercial art programs.	2	
17080	Photography	10-12	Students will gain knowledge and skill that will enable them to recognize and understand Commercial Photography in the following areas: 35 mm Camera Operation, Film Processing, Printing/Enlarging, and Lighting. Students will become aware of occupational and advanced training opportunities in Photography. <b>Note:</b> Photography is also coded in Art.	1 - 4	License Code: 17080-Photography ◆ 10-12
17100	Construction Technology I	10-12	Construction Technology 1 provides an orientation to the construction trade the meets industry standards. The course is standards based beginning with the Core Curriculum which includes Basic Safety, Construction Math, Introduction to Hand and Power Tools, Introduction to Blue Prints, Basic Rigging, Communication and Employability Skills. Fundamentals of Construction are introduced including Floor Systems, Wall Systems, Roof Systems and Structure Enclosure. Construction Tech 1 is a prerequisite to Construction Tech 2.	1 or 2	License Code: 17100-Construction Technology ◆ 10-12
17117	Construction Technology II ◆ Prerequisite: 17100 - Construction Technology I	11-12	Construction Technology 2 continues with the Fundamentals of Construction with advanced training in Floor, Wall and Roof Systems. Advanced enclosure techniques will be included. Enhanced safety protocol will be included with emphasis on safety practices on project and the use of a safety officer. Students who successfully complete course modules and meet all safety standards will be eligible to receive national recognition and can articulate the national recognition into college construction craft programs.	2	

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17101	Virtual Center Construction Technology Summer Academy	10-12	<p>Construction Technology 17101 provides a hands-on opportunity for students to integrate classroom materials such as Basic Safety, Construction Math, Introduction to Hand Tools and Power Tools, Introduction to Blueprint Reading, Communication and Employability Skills with a summer academy. This summer academy will combine the classroom skills with hands-on learning of construction fundamentals including Wall Systems, Floor Systems, Roof Systems and Structure Enclosure.</p> <p>Virtual Construction Technology Summer Academy must be part of Construction Technology I and II and is only for students in established Virtual Centers. This class must be offered as part of the Construction Technology program. The Virtual Center must receive prior approval from the Department of Career and Technical Education before offering the Construction Technology class as an option.</p>	1/2	License Code: 17100-Construction Technology ◆ 10-12
17110	Facilities Maintenance I	10-12	Facilities Maintenance 1 orientates students to careers in maintaining buildings such as office buildings or schools. The course is standards based beginning with the Core Curriculum which includes Basic Safety, Construction Math, Introduction to Hand and Power Tools, Introduction to Blue Prints, Basic Rigging, Communication and Employability Skills. Introduction to door repair or replacement, window repair or replacement, maintaining various floor surfaces and understanding cleaning methods for a variety of surfaces. Facilities Maintenance 1 is a prerequisite to Facilities Maintenance 2.	1 or 2	License Code: 17110-Facilities Maintenance ◆ 10-12
17118	Facilities Maintenance II  ◆ Prerequisite: 17110 - Facilities Maintenance I	11-12	Facilities Maintenance 2 incorporates advanced skill training. The Core Curriculum is completed and enhanced safety protocol including participation as a safety officer is included. Additional topics will be introduced including electrical device service, plumbing fixture maintenance and landscape maintenance. Students who successfully complete course modules and meet all safety standards will be eligible to receive national recognition and can articulate the national recognition into college construction craft programs.	2	

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17112	Heating, Ventilating, & Air Conditioning	10-12	This is an introductory course that addresses air quality standards of the interior environment. Instruction will be provided in the areas of heating and cooling. Students will learn the basic concepts in circulating and cleaning the air as well as adding or removing humidity. An introduction covers safety, tools, equipment and the fundamentals of electricity. Students will work with electrical components, wiring, compressors, evaporators, condensers and metering devices. Troubleshooting methods will be taught in heating and cooling systems.	1 - 2	License Code: 17112-Heating, Ventilating, & Air Conditioning ◆ 10-12
17113	Automated Manufacturing	10-12	Students will gain knowledge of the concepts and career opportunities in the manufacturing industry. Craft course offerings will include courses such as metal welding, machining, blueprint reading, fabrication, robotics, assembly, industry terminology, safety, tools, milling, electrical principals, and measurement. Course of study will also incorporate leadership skills, professional development and organizational skills.	1 - 4	License Code: 17113-Automated Manufacturing ◆ 10-12
17115	Sheet Metal Technology	10-12	This course provides instruction in the sheet metal industry as it relates to the cooling and heating of interior environments. The following aspects of the sheet metal industry will be introduced: basic safety, math; hand tools, power tools; blueprints and specifications; fasteners, hangers and supports; steel and other metals; and an introduction to insulation. Sheet metal processes will include sheet metal duct fabrication; gutters and downspouts, and roof flashing.	1 - 2	License Code: 17115-Sheet Metal Technology ◆ 10-12
17120	Residential Plumbing	10-12	This course provides the student with the basic knowledge of the plumbing code, trade skills, job site expectations and blueprint reading. The curriculum includes state codes, various aspects of materials, equipment and fixtures, service and installation procedures. Activities will include; layout of water and sanitation systems; working with a variety of materials such as cast iron, plastic, copper and steel; setting fixtures and proper hookups; and plumbing service.	1 - 2	License Code: 17120-Residential Plumbing ◆ 10-12
17125	Electrical Technology	10-12	This program will provide students with the background necessary to enter the field of electrical wiring in residential construction. The course of study includes; electrical fundamentals, electrical code study, math, residential wiring, electrical drafting and blueprint reading, and alternating current theory. Hands-on practical wiring of equipment circuits will be provided in a laboratory setting.	2	License Code: 17125-Electrical Technology ◆ 10-12

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17130	Drafting Technology I	10-12	Drafting Technology 1 introduces careers in drafting. The course covers theory, laboratory and shop work related to gathering and translating data or specifications. Orientation to the use of drafting tools and beginning Computer Aided Drafting software is included in the first year. The types of drafting introduced include architectural, mechanical, structural, pneumatic, marine, electrical-electronic, topographical as well as other drawings and sketches. Drafting Technology 1 is a prerequisite course to Drafting Technology 2.	1 or 2	License Code: 17130-Drafting Technology ◆ 10-12
17131	Drafting Technology II  ◆ Prerequisite: 17130 - Drafting Technology I	11-12	Drafting Technology 2 provides advanced software applications training requiring greater detail and accuracy. Use of reproduction materials, equipment and processes, preparation of reports and data sheets for specification writing, development of plan and process charges and development of models will be included. Completion of the Drafting Program prepares students for college drafting.	2	
17140	Television Production	10-12	To prepare students for employment in Television Communications. Television Production is designed to offer students basic job entry knowledge and skills needed in television production. The course offers an in-depth study of the television field. There is also a heavy concentration on "hands on" experience in actual production. The student will learn how to prepare, produce and evaluate television productions, as well as understand viewer impact. The student will demonstrate proficiency in the use of all equipment used in television production. Emphasis on applied academics, professional development, leadership, and organization skills are integrated throughout the curriculum.	1 - 4	License Code: 17140-Television Production ◆ 10-12
17150	Electronics Technology I	10-12	Electronics Technology 1 will provide students with a working knowledge of Direct Current (DC) and Alternation Current (AC) theory and application. Integrated math and physic concepts will be provided to support the understanding of DC and AC circuitry. Electronics Technology 1 is a prerequisite course to Electronics Technology 2.	1 or 2	License Code: 17150-Electronics Technology ◆ 10-12

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17151	Electronics Technology II  ◆ Prerequisite: 17150 - Electronics Technology I	11-12	Electronics Technology 2 continues skill development using solid state technology such as diodes, transistors, integrated circuits, optoelectronic devices, digital electronics, power supplies and amplifiers. Additional topics that will be included are communication, instrumentation, lasers, security systems and electronic systems technology. Articulation with college electronics programs is available. Electronics Technology II is a prerequisite to Electronics Technology III.	1 or 2	License Code: 17150-Electronics Technology ◆ 10-12
17152	Electronics Technology III  ◆ Prerequisite: 17151 - Electronics Technology II	11-12	Designing and installing computer networks, home theater, security systems and Programmable Logic Computers. Students will also have opportunities for Career tours and hands-on projects to enhance the students understanding of the electronics career field. Full articulation agreements with post-secondary education with successful completion of the course.	1 - 2	
17190	Graphic Communications I	10-12	Graphic Communications 1 includes instruction in graphic theory, hot and cold typesetting, lithography, photoengraving and other graphic arts related to the printing industry. Emphasis on applied academics, professional development, leadership and organizational skills are integrated. Graphic Communications 1 is a prerequisite course to Graphic Communications 2.	1 or 2	License Code: 17190-Graphic Communications ◆ 10-12
17191	Graphic Communications II  ◆ Prerequisite: 17190 - Graphic Communications I	11-12	Graphic Communications 2 provides advanced instruction in typographical layouts and designs, hand and machine typesetting, camera and plate work. Emphasis on applied academics, professional development, leadership and organizational skills are integrated. Graphic Communications	2	
17230	Machine Tooling Technology	10-12	To prepare students to enter the machine tool operation. Covers the theory and shop work related to the teaching of safe and intelligent operation of machines found in industry are emphasized. Included is practical application of theory which is required by the occupation. Units of instruction include safety, measurement, tools, cutting tools and speeds, lathes, milling shapers, grinders, and other machine operation. Emphasis on applied academics, professional development, leadership, and organizational skills are integrated throughout the curriculum.	1 - 4	License Code: 17230-Machine Tooling Technology ◆ 10-12

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17236	Welding Technology I	10-12	This course introduces students to a career in welding. The course begins covering various types of metal welding, brazing, flame cutting, properties of metals, blueprint reading, electrical principles, welding symbols and mechanical drawing. Emphasis on applied academics, professional development, leadership, and organizational skills are integrated throughout the curriculum. Welding Technology 1 is a prerequisite course to Welding Technology 2.	1 or 2	License Code: 17236-Welding Technology ◆ 10-12
17237	Welding Technology II  ◆ Prerequisite: 17236 - Welding Technology I	11-12	Welding Technology 2 provides advanced training in the various welding applications in preparation for college welding programs or entering employment. The course will adhere to American Welding Society standards in welding processes. Continued emphasis will be placed on applied academics, professional development, leadership, and organizational skills.	2	
17238	Virtual Center Welding Technology Summer Academy	10-12	Welding Technology 17238 is a Summer Academy that allows students the opportunity to take fundamentals learned through online instruction, ITV instruction, or articulation from an accepted Agriculture program to gain training in advanced welding techniques. Students will be given more detailed instruction and hands-on training in American Welding Society recognized processes preparing them for industry certification testing.  Virtual Welding Technology Summer Academy must be a part of the Welding Technology or Ag Mechanics class for students in Virtual Centers only and must be offered as part of the Welding Technology program. The Virtual Center must receive prior approval from the Department of Career and Technical Education before offering the Welding Technology class as an option.	½	

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17310	Recreational Small Engine Technology I	10-12	Recreational Small Engine Technology 1 includes the maintenance repair of a variety of small engines such as lawnmowers, outboard motors, chain saws and rototillers. The course includes theory and practical application lab. This course is a prerequisite to Recreational Small Engines 2.	1 or 2	License Code: 17310-Recreational Small Engine Technology ◆ 10-12
17311	Recreational Small Engine Technology II  ◆ Prerequisite: 17310 - Recreational Small Engine Technology I	11-12	Recreational Small Engine Technology 2 provides advance instruction in maintenance repair of a variety of small engines. The course includes principles of the internal engine, reading technical manuals and customer service.	2	
17812	Aviation Technology	10-12	To provide students for employment in the aviation field. The course covers fundamentals of flight, flight operations, aviation weather, performance and navigation. The course also explores careers in air traffic control, flight dispatching and airport management. Units of instruction include; safety of flight, airport layout, aeronautical charts, radar, radio procedures, airplane power plant, aerodynamics, weather patterns and hazards. Emphasis on applied academics in math and science are integrated throughout the curriculum along with decision-making principles as it applies to flight-related factors.	1 or 2	License Code: 17812-Aviation Technology ◆ 10-12
17813	Aviation Technology II	11-12	Students will be prepared to pass the Federal Aviation Administration, FAA, private pilot verbal exam. Course will cover advanced flight topics as well as topics covered in aviation I to an advanced level. Students will also work in teams to build a full scale aircraft.	1 or 2	

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17999	Cooperative Work Experience	11-12	<p>Provides students with a regularly scheduled, supervised employment opportunity related to Trade and Industrial Occupations in order to develop and improve work skills. The employment must be preceded by, or concurrent with, classroom instruction related to the work experience, consistent with the student's occupational goals, and related to the Trade and Industrial Education program area. There shall be a training agreement among all partners to the work experience (school, employer, student, and parents/guardians) outlining the expectations of each party. The instructor shall also develop a specific training plan with the employer for each student placed. The training plan shall include provisions for assessment of student progress and for on-site visits by the instructor during the student's placement.</p> <p><b>NOTE:</b> <i>Students must be at least 16 years old and may be paid a wage by the employer.</i></p>	maximum of ½ per semester, not to exceed 2 credits while in high school	License Code: 17999-Cooperative Work Experience ♦ 10-12

\* High school curricular requirements are spelled out in NDCC 15.1-21-02. Accreditation Rules can be found at <http://www.legis.nd.gov/information/acdata/pdf/67-19-01.pdf>. For accreditation, schools must provide additional units of credit based on school enrollment [see NDAC 67-19-01-32 (3)].

\*\* Please refer to the second page of the teacher's North Dakota Educator's Professional license to verify which subject areas a teacher is qualified to teach. Licenses and endorsements are obtained on a teaching license from the Education Standards and Practices Board (ESPB). Credentials are obtained from the Department of Public Instruction (DPI) and are issued to individuals holding a current teaching license.