

## HIGH SCHOOL INFORMATION TECHNOLOGY COURSE CODES GRADES 7-12

*High school (grades 9-12) courses in Information Technology require 150 contact hours per credit.*

Course Code	Course Name	Grade Levels	Description	Accreditation Time/ Credit Options*	License/credential Required**
27005	Introduction to Information Technology	7-8	An exploratory level course that provides an exposure to careers and issues in information technology. Students will develop SCAN skills including teamwork, communication, entrepreneurship, and personal management. Students will also gain hands-on experience in three major IT areas including: Hardware and Software: Safety and tools, numbering systems and basic electricity, operating systems, troubleshooting, etc. Networking: LAN fundamentals, peer-to-peer networking, IP Addressing, troubleshooting, etc. Programming/Interactive-media: Visual Basic and HTML basics	NDAC 67-19-01-34 (2)(b) ♦ may be counted as part of the minimum 200 minutes per week of additional courses	License Code: 27005-CTE Information Technology ♦ 7-12
27008	Computer Software Applications	7-8	Semester modules in computer applications may include a broad-based overview of office suites or skills leading to high-level competencies in spreadsheets, databases, presentations, desktop publishing, etc. Successful attainment of competencies within each office suite prepares students for industry certification, such as MOUS (Microsoft Office User Specialist).	NDAC 67-19-01-34 (2)(b) ♦ may be counted as part of the minimum 200 minutes per week of additional courses	License Code: 27008-CTE Computer Software ♦ 7-12
27101	Introduction to Information Technology	9-12	An exploratory level course that provides an exposure to careers and issues in information technology. Students will develop SCAN skills including teamwork, communication, entrepreneurship, and personal management. Students will also gain hands-on experience in three major IT areas including: Hardware and Software: Safety and tools, numbering systems and basic electricity, operating systems, troubleshooting, etc. Networking: LAN fundamentals, peer-to-peer networking, IP Addressing, troubleshooting, etc. Programming/Interactive-media: Visual Basic and HTML basics	¼, ½, or 1	License Code: 27101-CTE Information Technology ♦ 7-12
27102	Computer Software Applications	9-12	Semester modules in computer applications may include a broad-based overview of office suites or skills leading to high-level competencies in spreadsheets, databases, presentations, desktop publishing, etc. Students will gain skills at the proficient or expert level in office suite software. Successful attainment of competencies within each office suite prepares students for industry certification, such as MOUS (Microsoft Office User Specialist).	½, 1, or 2	License Code: 27102-CTE Computer Software ♦ 7-12

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27122	Programming Essentials-Visual Basics	9-12	Basic programming concepts are presented which are transferable to other programming languages. Foundational concepts and fundamentals of computer programming including logic, design, coding, structure, and controls are addressed. Careers in programming are explored and students are provided with opportunities to increase their communication, teamwork, and critical thinking skills. Business projects are used to show how programming skills are used in the business world.	½ or 1	License Code: 27122-CTE Programming Essentials-Visual Basics ◆ 9-12
27125	Fundamentals of JAVA Programming	9-12	The Fundamentals of JAVA Programming Language course provides a conceptual understanding of Object Oriented programming. The course also teaches students how to use JAVA's Conditional Control Structures, Loop Structures and Strings, Classes and Object Oriented Development, Inheritance and Polymorphism, Arrays, GUIs and Event-Driven Programming.	½ or 1	License Code: 27125-Fundamentals of JAVA Programming ◆ 9-12
27127	Advanced JAVA Programming	9-12	The Advanced JAVA Programming course will present concepts covered by Advanced Placement Computer Science. The goals of the course are comparable to those in the introductory sequence of courses for computer science majors offered in college and university computer science departments. Students completing the course will be able to design and implement computer-based solutions to problems in several application areas; learn well-known algorithms and data structures; be able to develop and select appropriate algorithms and data structures to solve problems. Students will be able to code fluently in a well-structured fashion using the programming language JAVA and be able to read and understand a large program and a description of the design and development process leading to such a program.	½ or 1	License Code: 27127-Advanced JAVA Programming ◆ 9-12
27170	Introduction to Web Design	9-12	The Web Design course is an introductory standards-based course on Web Design. The course includes learning experiences in basic HTML, modern web features including Cascading Style Sheets (CSS) and interactivity, web standards and accessibility, creation of web media, and planning, development, publishing, and evaluation of web sites. The course is based upon the ISTE's National Educational Technology Standards for Students (NET-S), 21 <sup>st</sup> Century Skills, and the ACM Model Curriculum for K-12 Computer Science.	½ or 1	License Code: 27170-Introduction to Web Design ◆ 9-12

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27180	CIW Foundations	9-12	<p>The Web Design course will be using the CIW Foundations Series. Completion of the course will give students the necessary skills to complete the industry standard CIW Foundations Certification. The course includes: Internet Fundamentals, Web Page Authoring Fundamentals, and Networking Fundamentals.</p> <p>Internet Fundamentals will teach students how to use key Internet technologies, such as Web browsers, e-mail, newsgroups, File Transfer Protocol, Telnet, and search engines. Students gain experience configuring both Netscape Navigator and Microsoft Internet Explorer to access rich multimedia, including RealPlayer, Shockwave and Flash content. Students also use a variety of Web-based search engines to conduct advanced searches and learn the basics of electronic commerce and security issues.</p> <p>Web Page Authoring Fundamentals will teach students Web page creation and other aspects of Web authoring. Students gain experience developing Web pages in a text editor and a graphical user interface editor. Students also learn how to use Cascading Style Sheets and study the basics of Extensible Hypertext Markup Language, JavaScript, Dynamic HTML, and the Document Object Model. After completing this course, students will be able to create simple Web pages containing text, graphics, hyperlinks, tables, forms, and frames.</p> <p>Networking Fundamentals is designed to teach students fundamental networking concepts and practices. Topics include network architecture and standards, networking protocols, TCP/IP, Internet servers, server-side scripting and database connectivity, and security.</p>	½ or 1	License Code: 27180-CIW Foundations ♦ 9-12

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27185	CIW Site Design	9-12	CIW Site Design is an advanced course that teaches students how to create and manage Web sites with tools such as Microsoft FrontPage, Macromedia Dreamweaver and Flash, Dynamic HTML, and various multimedia and CSS standards. Students will implement future technology standards and explore the incompatibility issues surrounding current browsers. The course focuses on theory, design and Web construction, along with information architecture concepts, Web project management, scenario development and performance evaluations.	½ or 1	License Code: 27185-CIW Site Design ◆ 9-12
27219	Computer Hardware and Operating Systems (A+)	9-12	An introductory level course that focuses on essential hardware and operating system competencies for an entry-level PC service technician. Students will demonstrate basic knowledge of installing, configuring, upgrading, troubleshooting, and repairing microcomputer systems and operating systems. Work-based strategies appropriate for this course. Computer Hardware related careers are explored and students are provided with opportunities to increase their communication, teamwork, and critical thinking skills. Students completing the full year program will be prepared for computer industry certification, such as CompTia's A+ certification exam or IC3 certification. (Possible curriculum: ExplorNet, HP/Cisco Sponsored IT Essentials Part 1, Aries, Computer Prep, Element K, etc.)	½, 1, or 2	License Code: 27219-Computer Hardware and Operating Systems (A+) ◆ 9-12

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27220	IT Essentials 2	9-12	<p>This course introduces and extends the knowledge of operating systems, the benefits of networking, and types of networks. The physical components of a network are reviewed, including the NIC, types of media, and networking devices that provide Internet connections. The concepts covered in this course include TCP/IP networking, IP addressing, name resolution, and protocols. The importance of a hardware inventory list is stressed, as is verifying compatibility with the network. The steps to install a network operating system, including Windows 2000 and Linux, are covered in detail.</p> <p>The course introduces the responsibilities of a network administrator, including managing users and groups, and creating directories, passwords, and permissions. It covers backup methods and strategies, partition and process management, monitoring server resources, and analyzing network performance. The course discusses troubleshooting the operating system, including how to identify the type of problem, creating an emergency boot disk, and the process of disaster recovery. It addresses security issues and how to assess security needs and develop an acceptable-use policy to prevent inside and outside threats. This course will help prepare students for CompTIA's Server+ certification exam.</p>	½ or 1	License Code: 27220- IT Essentials ◆ 9-12
27265	Introduction to Networking	9-12	An introduction to networking course which introduces students to the principles and practices of designing, building and maintaining computer networks. Topics would include: networking administration and support, media and topologies, protocols and standards, network implementation, and network support. The course would prepare students for CompTIA's Network + certification.	½ or 1	License Code: 27265-Introduction to Networking ◆ 9-12
27266	Cisco Discovery I	9-12	Cisco Discovery I (Networking for Home and Small Businesses) is the first of the four courses leading to the CCNA industry certification. Students will learn how to set up a personal computer system, including the operating system, interface cards, and peripheral devices. They will be able to plan and install a small network connected to the Internet, troubleshoot network and Internet connectivity, share resources such as files and printers among multiple computers, recognize and mitigate security threats to a home network, and configure an integrated wireless access point and wireless clients.	½ or 1	License Code: 27266-CTE Cisco Discovery I ◆ 9-12

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27267	Cisco Discovery II  ◆ Prerequisite: 27266-Cisco Discovery I	9-12	Cisco Discovery II (Working at a Small-to-Medium Business or ISP) is the second of four courses that leads to the CCNA industry certification. Students completing this course can choose to complete the CCENT industry certification. Students will understand the structure of the Internet and how communication occurs between hosts. They will be able to install, configure, and troubleshoot Cisco IOS devices, plan a basic wired infrastructure to support network traffic, configure a server to share resources and provide common Web services, implement basic WAN connectivity using Telco services, and demonstrate proper disaster-recovery procedures and perform server backups.	½ or 1	License Code: 27267-CTE Cisco Discovery II ◆ 9-12
27268	Cisco Discovery III  ◆ Prerequisite: 27267-Cisco Discovery II	9-12	Cisco Discovery 3 (Introducing Routing and Switching in the Enterprise) is the third of four courses that leads to the CCNA industry certification. Students will learn how to implement a LAN for an approved network design, configure a switch with VLANs and inter-switch communication, implement access lists to permit or deny specific traffic, implement WAN links, configure routing protocols on Cisco devices, and perform LAN, WAN, and VLAN troubleshooting using a structured methodology and the OSI model.	½ or 1	License Code: 27268-CTE Cisco Discovery III ◆ 9-12
27269	Cisco Discovery IV  ◆ Prerequisite: 27268-Cisco Discovery III	9-12	Cisco Discovery IV (Designing and Supporting Computer Networks) is the last of four courses that leads to the CCNA industry certification. Students will learn how to gather customer requirements, design a simple Internetwork using Cisco technology, design an IP addressing scheme to meet LAN requirements, create an equipment list to meet LAN design requirements, install and configure a prototype Internetwork, and obtain and upgrade Cisco IOS software in Cisco devices.	½ or 1	License Code: 27269-CTE Cisco Discovery IV ◆ 9-12
27299	Special Topics	9-12	An examination of special topics in cutting edge computer information technologies. Some topics may include geographic information systems, telecommunications, internet, data communications, etc. Prior to instruction, an Alternative Curriculum Form must be submitted for approval to the IT division of the Department of Career and Technical Education.	¼, ½, 1, or 2	License Code: 27299-CTE Special Topics ◆ 9-12

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27300	Windows XP Professional	9-12	<p>Students will be introduced to the implementation and desktop support of Microsoft Windows XP Professional Operating System. The course will prepare students for Microsoft's exam 70-270: Installing, Configuring, and Administering Microsoft Windows XP Professional.</p> <p>Topics include:</p> <ul style="list-style-type: none"> <li>◆ Install Windows XP Professional and upgrade to Windows XP Professional.</li> <li>◆ Automate an installation of Windows XP Professional by using answer files and Uniqueness Database Files (UDFs), or by using the Microsoft Windows 2000 System Preparation Tool.</li> <li>◆ Configure and manage hardware on a computer running Windows XP Professional.</li> <li>◆ Manage disks.</li> <li>◆ Configure and manage file systems.</li> <li>◆ Troubleshoot the boot process and other system issues.</li> <li>◆ Configure the desktop environment, and use profiles to control desktop customization.</li> <li>◆ Configure and support Transmission Control Protocol/Internet Protocol (TCP/IP).</li> <li>◆ Configure Windows XP Professional to operate on Windows networks.</li> <li>◆ Support remote users.</li> <li>◆ Configure Windows XP Professional for mobile computing.</li> <li>◆ Monitor resources and performance.</li> </ul>	½ or 1	License Code: 27300-CTE Windows XP Professional ◆ 9-12
27310	Windows 2003 Server	9-12	<p>This is an advanced network operating system course which will teach students how to install, configure, administer, and support the primary networking services in the Microsoft Windows Server 2003 operating systems. The course examines basic TCP/IP networking concepts. The course also covers the core Windows Server 2003 networking services, such as the Domain Name System (DNS), the Windows Internet Name Service (WINS), and Routing and Remote Access Services (RRAS), and network security technologies such as digital certificates and the IP security extensions (IPSec). The course will help to prepare students for the <u>Microsoft Certification Exam 70-290: Managing and Maintaining a Microsoft Windows Server 2003 Environment</u>.</p>	½ or 1	License Code: 27310-CTE Windows 2003 Server ◆ 9-12

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27400	Geographic Information Systems (GIS)	9-12	Students will have the opportunity to gather technical skills in the areas of geographic information systems, remote sensing, and global positioning systems. Students will learn the basic ESRI AcrView interface in the context of local and global problems. They will gain experience in the use of global positional system (GPS) units to gather authentic data and will be able to overlay their collected data on aerial photographs and/or satellite images.	½ or 1	License Code: 27400-CTE Geographic Information Systems (GIS) ◆ 9-12
27500	Data Modeling and SQL	9-12	Students are challenged to identify patterns and connections between information that is not obviously related; to identify key underlying business issues in complex scenarios. This course will prepare students for the "Introduction to Oracle 9i – SQL" Oracle Certified Professional exam. This course focus on the following objectives: <ul style="list-style-type: none"> <li>◆ Transform business requirements into an operational database utilizing a top-down, systematic approach</li> <li>◆ Create Entity-Relationship Diagrams that accurately model the organization's information needs and support the functions of the business</li> <li>◆ Map the information requirements reflected in the Entity-Relationship Model into a relational database design</li> <li>◆ Create physical relational database tables to implement the database design</li> <li>◆ Manage a data analysis project that delivers a persuasive database design and model for a potential client.</li> <li>◆ Solve complex business problems using data storage and retrieval techniques</li> <li>◆ Articulate issues involving data security and keeping "history" of data in business systems, as well as the role of the Database Administrator in these practices.</li> <li>◆ Use interviewing skills and techniques learned as they approach post-secondary education or future employment</li> </ul>	½ or 1	License Code: 27500-CTE Data Modeling and SQL ◆ 9-12

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27610	Fundamentals of Nanoscience I	11-12	<p>This course is designed to expose students to the new and rapidly emerging fields of nanoscience and nanotechnology technicians as well as advanced fields of study. It is designed to establish a basic understanding of the following:</p> <ul style="list-style-type: none"> <li>• Underlying scientific basis for the behavior of nano-materials.</li> <li>• Scope of nano-materials potential use in products manufactured by various industries.</li> <li>• Methods of fabrication and characterization of nano-materials.</li> </ul> <p>Nanoscience is a field of scientific study which is cross disciplinary and encompasses the broad areas of chemistry, biology and physics, materials science and engineering. Nanoscience strives to understand the composition, structure, properties and behavior of the molecules and atoms which make up the material in our environment and newly created nano-materials. Nanotechnology is the purposeful design and production of a product at the nanoscale (or microscale) which has useful application in our world.</p>	1/2	License Code: 27610-CTE Fundamentals of Nanoscience I ♦ 9-12
27611	Fundamentals of Nanoscience II	11-12	<p>Fundamentals of Nanoscience I is required before a student can enroll in this course.</p> <p>This course is the second semester of a two semester course sequence. It is designed to expose students to the new and rapidly emerging fields of nanoscience and nanotechnology technician as well as advanced fields of study. It is designed to establish a basic understanding of the following:</p> <ul style="list-style-type: none"> <li>• Characterization and Analysis Techniques utilized to study nano-materials.</li> <li>• Specific applications and examples of nano-materials in the various industry areas.</li> </ul>	1/2	License Code: 27611-CTE Fundamentals of Nanoscience II ♦ 9-12

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27620	Alternative Energy and Environment I	11-12	This course is an overview of the alternative methods of energy production currently available for use and those that are nearing implementation in the near future. The course is designed to expose students to the spectrum of energy production methods other than petroleum based, the methods used to make the energy, the economics and environmental impact of their use, the science behind the process. It is designed to introduce students to the technician roles in this area and other available pathways. Topics covered include solar, wind geothermal, bio-fuels, biomass, gasification, hydrogen fuel cells, nuclear, hydroelectric (traditional, tidal surge and ocean current based methods).	1/2	License Code: 27620-Alternative Energy and Environment I ◆ 9-12
27621	Alternative Energy and Environment II	11-12	This course is an overview of the alternative energy production methods such as BioFuels, solar, nuclear, wind, geothermal, etc. and the environment. The course will expose students to the impact of the energy production methods on the environment including air, water, and soil, greenhouse gas emission, carbon sequestration, carbon economy and other related topics.	1/2	License Code: 27621-Alternative Energy and Environment II ◆ 9-12
27999	CTE Cooperative Work Experience	11-12	Provides students with a regularly scheduled, supervised employment opportunity related to Information Technology 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 Information Technology 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. <b>NOTE:</b> <i>Students must be at least 16 years old and may be paid a wage by the employer.</i>	maximum of ½ per semester, not to exceed 2 credits while in high school	License Code: 27999-CTE Cooperative Work Experience ◆ 9-12

\* 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.*