

HIGH SCHOOL INFORMATION TECHNOLOGY COURSE CODES GRADES 9-12

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

Course Code	Course Name	Grade Levels	Description	High School Credit Options*	License/credential Required**
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: <ul style="list-style-type: none"> • 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 	$\frac{1}{4}$, $\frac{1}{2}$, or 1 <i>Max credit = 1</i>	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).	$\frac{1}{2}$, 1, or 2 <i>Max credit = 2</i>	License Code: 27102-CTE Computer Software ◆ 7-12
27120	Introduction to Programming Languages	9-12	This course will provide students with a solid foundation for understanding the fundamental concepts of programming languages. It will include coverage of concepts and constructs from languages like C#, JAVA™, JavaScript™, Perl, PHP, Python, Ruby, XHTML, XSLT, and JSP.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	License Code: 27120-CTE Introduction to Programming Languages ◆ 7-12
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.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	License Code: 27122-CTE Programming Essentials-Visual Basics ◆ 9-12

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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 <i>Max credit = 1</i>	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 <i>Max credit = 1</i>	License Code: 27127-Advanced JAVA Programming ◆ 9-12
27128	Mobile Applications Development	9-12	This course will introduce students to mobile application development and management using a variety of commercial and open source software. Topics to be included in the course are: (1) Installation and modification of application; (2) Code modification; (3) Design and implementation; (4) Database systems management; (5) Security; and (6) Customer Service.	½ or 1 <i>Max credit = 1</i>	License Code: 27128-Mobile Applications Development ◆ 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 st Century Skills, and the ACM Model Curriculum for K-12 Computer Science.	½ or 1 <i>Max credit = 1</i>	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>	<p style="text-align: center;">½ or 1</p> <p style="text-align: center;"><i>Max credit = 1</i></p>	<p>License Code: 27180-CIW Foundations ◆ 9-12</p>

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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 <i>Max credit = 1</i>	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 <i>Max credit = 2</i>	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>	<p>½ or 1</p> <p><i>Max credit = 1</i></p>	<p>License Code: 27220- IT Essentials ◆ 9-12</p>
27265	Introduction to Networking	9-12	<p>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.</p>	<p>½ or 1</p> <p><i>Max credit = 1</i></p>	<p>License Code: 27265-Introduction to Networking ◆ 9-12</p>
27266	CCNA Introduction to Networks	9-12	<p>CCNA Introduction to Networks is the first of the four courses leading to the CCNA industry certification. This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the course. Students will be able to build simple LANs, perform basic configuration for routers and switches, and implement IP addressing schemes.</p>	<p>½ or 1</p> <p><i>Max credit = 1</i></p>	<p>License Code: 27266-CTE CCNA Introduction to Networks ◆ 9-12</p>

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27267	CCNA Routing & Switching Essentials ◆ Prerequisite: 27266-CCNA Introduction to Networks	9-12	CCNA Routing and Switching Essentials is the second of four courses that leads to the CCNA industry certification. This course describes the architecture, components, and operations of routers and switches in a small network. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. Students completing this course can choose to complete the CCENT industry certification.	½ or 1 <i>Max credit = 1</i>	License Code: 27267-CTE CCNA Routing & Switching Essentials ◆ 9-12
27268	CCNA Scaling Networks ◆ Prerequisite: 27267-CCNA Routing & Switching Essentials	9-12	CCNA Scaling Networks is the third of four courses that leads to the CCNA industry certification. This course describes the architecture, components, and operations of routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, and STP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement a WLAN in a small-to-medium network.	½ or 1 <i>Max credit = 1</i>	License Code: 27268-CTE Scaling Networks ◆ 9-12
27269	CCNA Connecting Networks ◆ Prerequisite: 27268-CCNA Routing & Switching Essentials	9-12	CCNA Connecting Networks is the last of four courses that leads to the CCNA industry certification. This course discusses the WAN technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students will also develop the knowledge and skills needed to implement virtual private network (VPN) operations in a complex network.	½ or 1 <i>Max credit = 1</i>	License Code: 27269-CTE CCNA Connecting Networks ◆ 9-12
27280	Introduction to Cybersecurity	9-12	Introduction to Cybersecurity covers trends in cybersecurity and career opportunities. Course modules will define cybersecurity, explain why it's important, and introduce products and processes used to secure data. Students will also explore why cybersecurity is critical in business and medical industries, how hackers use unsuspecting individuals to propagate malware, and why cybersecurity is a growing profession.	½ or 1 <i>Max credit = 1</i>	License Code: 27280-CTE Introduction to Cybersecurity ◆ 9-12

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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 <i>Max credit = 2</i>	License Code: 27299-CTE Special Topics ◆ 9-12
27300	Essentials of Desktop Operating Systems	9-12	Students will be introduced to the implementation and desktop support of Microsoft Windows Operating Systems. Essentials of Desktop Operating Systems course will prepare students to install one or multiple operating systems, configure and manage hardware, manage disks, troubleshoot, configure desktop environments, enable network connectivity, configure mobile computing, support remote users, monitor resources and performance, and maintain security.	½ or 1 <i>Max credit = 1</i>	License Code: 27300-CTE Windows XP Professional ◆ 9-12
27310	Essentials of Network Operating Systems	9-12	Essentials of Network Operating Systems courses provide a study of multi-user, multi-tasking network operating systems. In these courses students learn the characteristics of Microsoft Windows and Linux based operating systems and explore a variety of topics including installation procedures, security issues, back-up procedures, and remote access, TCP/IP concepts, DNS, digital certificates, and the OP security extensions.	½ or 1 <i>Max credit = 1</i>	License Code: 27310-CTE Windows 2003 Server ◆ 9-12
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 ArcView 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 <i>Max credit = 1</i>	License Code: 27400-CTE Geographic Information Systems (GIS) ◆ 9-12

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27500	Data Modeling and SQL	9-12	<p>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:</p> <ul style="list-style-type: none"> • Transform business requirements into an operational database utilizing a top-down, systematic approach. • Create Entity-Relationship Diagrams that accurately model the organization’s information needs and support the functions of the business. • Map the information requirements reflected in the Entity-Relationship Model into a relational database design. • Create physical relational database tables to implement the database design. • Manage a data analysis project that delivers a persuasive database design and model for a potential client. • Solve complex business problems using data storage and retrieval techniques. • 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. • Use interviewing skills and techniques learned as they approach post-secondary education or future employment. 	<p>½ or 1</p> <p><i>Max credit = 1</i></p>	<p>License Code: 27500-CTE Data Modeling and SQL ◆ 9-12</p>

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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"> • Underlying scientific basis for the behavior of nano-materials. • Scope of nano-materials potential use in products manufactured by various industries. • Methods of fabrication and characterization of nano-materials. <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.</p> <p>Nanotechnology is the purposeful design and production of a product at the nanoscale (or microscale) which has useful application in our world.</p>	$\frac{1}{2}$ <i>Max credit = $\frac{1}{2}$</i>	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"> • Characterization and Analysis Techniques utilized to study nano-materials. • Specific applications and examples of nano-materials in the various industry areas. 	$\frac{1}{2}$ <i>Max credit = $\frac{1}{2}$</i>	License Code: 27611-CTE Fundamentals of Nanoscience II ♦ 9-12

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27999	Cooperative Work Experience	11-12	<p>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.</p> <p>NOTE: Students must be at least 16 years old and may be paid a wage by the employer.</p>	<p>Minimum of ½ credit per semester, not to exceed 2 credits while in high school</p> <p style="text-align: center;"><i>Max credit = 2</i></p>	<p>License Code: 27999-CTE Cooperative Work Experience ◆ 9-12</p>

* High school curricular requirements are spelled out in NDCC 15.1-21-02 and High school unit - instructional time is NDCC 15.1-21-03. Maximum credit refers to the maximum units of credit a student may earn for a course over four years of high school. (Example: Band - a student may be enrolled in band all four years of high school -- earning a possible total of four units of credit.)

** 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.