CAREER PROGRAMS IN INFORMATION TECHNOLOGY

CAREER CLUSTER	Information Technology	Information Technology	Information Technology	Information Technology	Manufacturing
CIP	**11.0201**	**11.0701**	**11.0801**	**11.0901**	**47.0104**
PROGRAM TITLE	**Computer Programming/ Programmer, General**	**Computer Science**	**Web Page, Digital/ Multimedia, and Information Resources Design**	**Computer Networking**	**Computer Installation and Repair Technology/ Technician**
ORIENTATION COURSES	Career Exploration	Career Exploration	Career Exploration	Career Exploration	Career Exploration
	Introduction to Computer Technology	Introduction to Computer Technology	Introduction to Computer Technology	Introduction to Computer Technology	Introduction to Computer Technology
	Digital Literacy	Digital Literacy	Digital Literacy	Digital Literacy	Digital Literacy
	Keyboarding & Formatting	Keyboarding & Formatting	Keyboarding & Formatting	Keyboarding & Formatting	Keyboarding & Formatting
					Introduction to Technology and Engineering (Industrial)
					Communication Technology
INTRODUCTORY COURSES	Computer Concepts and Software Applications	Computer Concepts and Software Applications	Computer Concepts and Software Applications	Computer Concepts and Software Applications	Computer and Information Technology
	Computer and Information Technology	Computer and Information Technology	Computer and Information Technology	Computer and Information Technology	Introduction to Computer Science
	Introduction to Computer Science	Introduction to Computer Science	Introduction to Computer Science	Introduction to Computer Science	Foundations of Technology
					Industrial Safety
SKILLS COURSE	Computer Operations and Programming I	Computer Sciences Principles	Webpage and Interactive Media Development 1	Computer Networking I	Computer Maintenance I
				Cybersecurity	
ADVANCED COURSES	Computer Operations and Programming II	Information Management	Webpage and Interactive Media Development 2	Computer Networking II	Computer Maintenance II
	Artificial Intelligence	Database Management and Data Warehousing	Interactive Media	Computer Forensics	Digital Electronics
	C++ Programming	Database Applications	Telecommunications	Essentials of Network Operating Systems	
	Java Programming	Computer Forensics	Mobile Applications	Computer Networking II	
WORKPLACE EXPERIENCE	Information Technology Workplace Experience	Information Technology Workplace Experience	Information Technology Workplace Experience	Information Technology Workplace Experience	Manufacturing Workplace Experience
	Computer Programming Workplace Experience	Computer Science Workplace Experience	Web Page and Media Design Workplace Experience	Networking Systems—Workplace Experience	Computer Installation and Repair Workplace Experience

A quality CTE program delivers all required elements of Illinois' definition of Size, Scope, Quality. CTE program elements include a sequence of courses. Each educational entity offering approved courses provides assurance that the course content includes at a minimum the state course description, meets the state's minimum requirements for course offerings by program, curriculum aligned to state-recognized learning standards and industry standards, career pathway guidance, resources to support program/course delivery (licensed and qualified staff, appropriate facilities, adequate equipment, instructional materials, work-based learning experiences, special populations support services, an active affiliated CTSO chapter), articulation/dual credit agreements, documentation of state agency certification or licensing requirements for occupations regulated by law or licensure, and content that prepare students for reflective of current labor and opportunity for workplace experience or a structured capstone course. ***Orientation courses are suggested to be taught at the prior-to-secondary or 9th-grade levels. Introductory level courses are suggested to be taught at the 9th-11th grade levels. Skill level courses are suggested to be taught at the 10th – 12th-grade levels. Workplace Experiences Courses are suggested to be taught at the 12th-grade level.***

Group	State Course Code	State Course Title	State Course Description
Group 1	22151A001	Career Exploration	Career Exploration courses help students identify and evaluate personal goals, priorities, aptitudes, and interests with the goal of helping them make informed decisions about their careers. These courses expose students to various sources of information on career and training options and may also assist them in developing job search and employability skills.
Group 1	10001A001	Introduction to Computer Technology	Introduction to Computer Technology courses are an approved part of career and technical education program that introduce students to computers, including peripheral and mobile devices; the functions and uses of computer technology; the language used in the industry; possible applications of various computer-based technologies; and occupations related to computer technology hardware and software industries. These courses typically explore legal and ethical issues associated with computer technology use, as well as how changes influence modern society. The appropriate use of technology and industry-standard equipment is an integral part of this course.
Group 1	10008A001	Digital Literacy	This course prepares students to use technology in a proficient and responsible manner in school, in the workforce, and in everyday life. The course contains skills for working in an Internet or networked environment and the knowledge of what it means to be a good digital citizen and the ability to use technology responsibly. Topics include the benefits and risks of sharing information online, and the possible consequences of inappropriate sharing (oversharing). Students explore the legal and ethical dimensions of respecting creative work. Technology use is a vital employability skill for entry-level and upper-level management positions. Students may be provided with the opportunity to seek industry-recognized digital literacy certifications.
Group 1	12005A001	Keyboarding and Formatting	Keyboarding and Formatting is a course designed to develop basic skills in touch keyboarding techniques for entering alphabetic, numeric, and symbol information found on computers and terminals. Students will learn to edit and format text and paragraphs, change fonts, work with headers and footers, cut and paste text, create, and use tab keys, create labels, and work with multiple windows. Students will format documents such as letters, envelopes, memorandums, reports, and tables for personal, educational, and business uses. During the second half of the course, major emphasis is placed on formatting documents, improving proofreading skills, and increasing speed and accuracy
Group 1	21052A002	Introduction to Technology and Engineering (Industrial)	Introduction to Technology & Engineering is comprised of the following areas: Production, Transportation, Communication, Energy Utilization and Engineering Design but is not limited to these areas only. This course will cover the resources, technical processes, industrial applications, material sciences, technological impact and occupations encompassed by that system.
Group 1	11002A001	Communication Technology	Communication Technology is a course designed to foster an awareness and understanding of the technologies used to communicate in our modern society. Students gain experience in the areas of design and drafting, radio and television broadcasting, computers in communication, photography, graphic arts, and telecommunications.

Group 2	10004A001	Computer Concepts and Software Applications	Computer Concepts and Software Applications is an orientation-level course designed to develop awareness and understanding of application software and equipment used by employees to perform tasks in business, marketing, and management. Students will apply problem-solving skills to hands-on, real-life situations using a variety of software applications, such as word processing, spreadsheets, database management, presentation software, and desktop publishing. Students will explore topics related to computer concepts, operating systems, telecommunications, and emerging technologies. The development of employability skills, as well as transition skills, will be included in the course as well as an understanding of the ethical considerations that arise in using information processing equipment and gaining access to available databases.
Group 2	10003A001	Computer and Information Technology	Computer and Information Technology courses are an approved part of career and technical education program that teach students to operate and use computer and information technology, emphasizing their role as tools to communicate more effectively, conduct research more efficiently, and increase productivity. Course content includes the legal and ethical issues involved with computer technology and use. The appropriate use of technology and industry-standard equipment is an integral part of this course.
Group 2	10012A001	Introduction to Computer Science	Introduction to Computer Science courses are an approved part of career and technical education program that present students with the conceptual underpinnings of computer science through an exploration of human computer interaction, web design, computer programming, data modeling, and robotics. While these courses include programming, the focus is on the computational practices associated with doing computer science, rather than just a narrow focus on coding, syntax, or tools. Introduction to Computer Science courses teach students the computational practices of algorithm design, problem solving, and programming within a context that is relevant to their lives. The appropriate use of technology and industry-standard equipment is an integral part of this course.
Group 2	21052A001	Foundations of Technology	The course employs teaching/learning strategies that enable students to build their own understanding of new ideas. It is designed to engage students in exploring and deepening their understanding of "big ideas" regarding technology and apply technological processes to solve real problems and develop knowledge and skills to design, modify, use and apply technology in the following areas: engineering design, manufacturing technologies, construction technologies, energy & power, information & communication technologies and emerging technologies.
Group 2	13004A001	Industrial Safety	Industrial Safety courses provide students with instruction in safe operating procedures related to various trades. Course topics may include the importance of standard operation procedures, agencies and regulations related to occupational safety and hazard prevention, and the dangers of particular materials.
Group 3	10152A001	Computer Operations and Programming I	Computer Operations and Programming I is the skill-level course designed to develop computer programming and program design skills through the use of various programming languages such as Visual Basic, C#, Java, and other object-oriented languages. Students will be exposed to the fundamentals of system analysis and design (e.g. flowcharting, diagramming, system design and planning), and the systems development life cycle. Instruction will include basic programming tools that are common to many programming languages. These may include items such as input /output statements, constants, assignment statements, string and numeric variable types, conditional

			processing, and branching and looping control structures. Students will learn programming techniques such as counting, averaging, rounding, and generation of random numbers to develop a good programming technique. Students will apply what they learn to create programs and applications that solve real-world business-related problems. Students will create programs to store, locate and retrieve data.
Group 3	10011A001	Computer Science Principles	Computer Science Principles courses are an approved part of career and technical education program that provide students the opportunity use programming, computational thinking, and data analytics to create digital artifacts and documents representing design and analysis in areas including the Internet, algorithms, and the impact that these have on science, business, and society. Computer Science Principles courses teach students to use computational tools and techniques including abstraction, modeling, and simulation to collaborate in solving problems that connect computation to their lives. Upon successful completion of this course, students will have acquired entry-level skills for employment and/or be prepared for postsecondary education
Group 3	10203A001	Web Page and Interactive Media Development 1	Web Page and Interactive Media Development I is a skill-level course designed to prepare students to plan, design, create and maintain web pages and sites. Students will learn the fundamentals of web page design using HTML, HTML editors, and graphic editors as well as programming tools such as JavaScript. Students will work in a project -based environment to create a working website. Students will learn to create pages, add hyperlinks, make tables and frames, create forms, integrate images, and set styles. Students will use image-editing programs to manipulate scanned images, computer graphics, and original artwork. Instruction will include creating graphical headers, interactive menus and buttons, and visually appealing backgrounds. Students will use hardware and software to capture, edit, create, and compress audio and video clips
Group 3	10102A001	Computer Networking I	Computer Networking I is a skill-level course designed to provide students with the skills needed to setup, configure, test, troubleshoot, maintain, and administer a data network using various network operating systems such as Novell, Windows, and Linux. Instruction will include network planning decisions, such as choosing an appropriate network configuration, determining the performance level requirements considering the differences among operating systems, and recommending network interface cards and cabling. Students will also learn how to setup and manage file systems and resources, and network topologies, protocols, and system utilities to efficiently run software applications on a network. Students will learn to use basic operating system commands, install, and configure networks, set up user accounts and rights, and establish user security and permissions
Group 3	10020A001	Cybersecurity	Cybersecurity courses introduce students to the concepts of cybersecurity. These courses provide students with the knowledge and skills to assess cyber risks to computers, networks, and software programs. Students will learn how to create solutions to mitigate cybersecurity risks. These courses may also cover the legal environment and ethical computing behavior related to cybersecurity.
Group 3	10252A001	Computer Maintenance I	This course is designed to provide students with the skills needed to install, setup, configure, test, troubleshoot, and maintain, personal computers and peripherals. Instruction includes assembling, maintaining, and upgrading personal computers. Students learn how to install, upgrade, and troubleshoot various hardware components such as motherboards, hard drives, CD- ROMS, memory,

			power supplies, video cards, sound cards, and network cards. Students install and configure various desktop operating systems such as Windows, Apple, and Linux. The course includes adding and removing software programs, installing and updating system drivers, creating startup and recovery disk, and updating the BIOS and CMOS. Students learn to conduct preventive maintenance and perform system backups, data transfer, and recovery routines as well as use diagnostic utilities to troubleshoot hardware and software problems. Students also learn how to disassemble, clean, troubleshoot, and reassemble peripherals such as printers
Group 4	10152A002	Computer Operations and Programming II	Computer Operations and Programming II is a skill-level course for students who have completed Computer Operations and Programming I. Students will use procedural and object-oriented programming languages such as Visual Basic, C# and Java. Students will learn programming concepts such as inheritance and polymorphism, advanced data handling (pointers, arrays, strings, and files), and common algorithms (recursion, searching and sorting). Students will be able to write, compile, run, test, debug and modify programs and applications that solve real world problems. Problem examples may include tracking inventory, scheduling rooms and facilities, accessing information and performing calculations.
Group 4	10160A001	Artificial Intelligence	Artificial Intelligence courses are an approved part of career and technical education program that introduce students to the concepts of Artificial Intelligence. This course will review the evolution of AI, explore future applications, and may also describes how artificial Intelligence is used in fields such as games, speech recognition, and computer vision. In this course, you will learn about different types of intelligent agents and their environments. The course Artificial Intelligence also covers the concepts of machine learning, natural language processing, expert systems, and robots. The ethics and safety issues related to artificial intelligence may also be covered in this course. The appropriate use of technology and industry-standard equipment is an integral part of this course.
Group 4	10154A001	C++ Programming	C++ Programming courses provide an opportunity for students to gain expertise in computer programs using the C++ language. As with more general computer programming courses, the emphasis is on how to write logically structured programs, include appropriate documentation, and use problem-solving techniques. More advanced topics may include multi-dimensional arrays, functions, sorting, loops, and records.
Group 4	10155A001	Java Programming	Java Programming courses provide students with the opportunity to gain expertise in computer programs using the Java language. As with more general computer programming courses, the emphasis is on how to structure and document computer programs, using problem-solving techniques. Topics covered in the course include syntax, I/O classes, string manipulation, and recursion.
Group 4	10051A001	Information Management	Information Management courses provide students with the knowledge and skills to develop and implement a plan for an information system that meets the needs of business. Students develop an understanding of information system theory, skills in administering and managing information systems, and the ability to analyze and design information systems.
Group 4	10052A001	Database Management and Data Warehousing	Database Management and Data Warehousing courses provide students with the skills necessary to design databases to meet user needs. Courses typically address how to enter, retrieve, and manipulate data into useful information. More advanced topics may cover implementing interactive applications for common transactions and the utility of mining data.

Group 4	10053A001	Database Applications	Database Application courses provide students with an understanding of database development, modeling, design, and normalization. These courses typically cover such topics as SELECT statements, data definition, manipulation, control languages, records, and tables. In these courses, students may use Oracle WebDB, SQL, PL/SQL, SPSS, and SAS and may prepare for certification.
Group 4	10301A001	Computer Forensics	Computer Forensics courses address the preservation, identification, extraction, documentation, and interpretation of computer data. Topics covered may include legal concepts, evidence handling and preservation, file system structures, chain of custody, and identification and recovery of computer data. These courses may also cover the need to perform an investigation and how to collect evidence and analyze data.
Group 4	10201A002	Web Page and Interactive Media Development II	Web Page and Interactive Media Development II is a skill-level course for students who have completed Web Page and Interactive Media Development I. Instruction will include using multimedia authoring applications and programming tools such as JavaScript to create a web site that combines text, hyperlinks, images, video, and sound. Instruction will include using hardware and software to capture, edit, create, and compress audio and video clips as well as create animated text, graphics, and images. Other topics will include using tables to align images with text, creating newspaper -style columns, and inserting side menus and call-outs. Students will learn how to use templates, cascading style sheets and interactive elements to enhance web pages. Students will learn to create dynamic forms that include multiple -choice questions, comment boxes, and buttons. Students will learn how to connect to a database and retrieve and write data. Students are encouraged to develop a portfolio project that demonstrates their expertise in areas such as multimedia authoring, web development, audio and video editing, and advanced JavaScript applications to create interactive web pages.
Group 4	10203A003	Interactive Media	Interactive Media courses provide students with the knowledge and skills to create, design, and produce interactive digital media products and services. The courses may emphasize the development of digitally generated and/or computer-enhanced media. Course topics may include 3D animation, graphic media, web development, and virtual reality. Upon completion of these courses, students may be prepared for industry certification.
Group 4	10006A001	Telecommunications	Telecommunications courses address the growth in global communications and the emerging equipment and systems needed to successfully communicate in a global environment. These courses cover such topics as data communication protocol and systems, government regulations of the communications industry, the use of cost-effective and productive tools to transmit messages and data, and live synchronistic video exchanges. Other topics may include telecommunications terminology, tools, and test equipment; customer service experience; and installation, repair, and delivery of telecommunications systems. In these courses, students may learn about such communication systems as e-mail, internet, or e-commerce, local area network (LAN), wide area network (WAN), voice transmission, cell phone technology, teleconferencing, and videoconferencing.
Group 4	10206A001	Mobile Applications	Mobile Applications courses provide students with opportunities to create applications for mobile devices using a variety of commercial and open source software. These courses typically address the installation and modification of these applications, as well as customer service skills to handle user issues.

Group 4	10102A002	Computer Networking II	Computer Networking II is an advanced course that allow students to learn skills to set up, configure, test, troubleshoot, maintain, and administer a data network using various network operating systems such as Novell, Windows, and Linux. Students will learn to use troubleshooting services, system monitoring utilities, and data backup and recovery systems. Instruction will include setting up and configuring various network services such as TCP/IP, DHCP, DNS, VPN, terminal services, e-mail, content filtering, and web services. Students will learn techniques to secure and protect network servers and data. Students will be introduced to some basic concepts regarding web server configuration. Students will also learn to use standard software tools to determine system vulnerabilities and correct these vulnerabilities by reconfiguring the operating system. Students will diagnose network problems using public domain network sniffers such as Ethereal. Instruction will include setting up and configuring a firewall, intrusion detection system, and encryption software for identifying and preventing potential network attacks
	10109A001	Essentials of Network Operating Systems	Essentials of Network Operating Systems courses provide students with an overview of multi-user, multi-tasking network operating systems. In these courses, students study the characteristics of operating systems, such as Linux, and various Windows network operating systems and explore a range of topics including installation procedures, security issues, back-up procedures, and remote access. Advanced topics may include network administration, including account management, training, evaluating new technology, developing system policies, troubleshooting, e-mail and business communications and Web site management.
Group 4	10252A002	Computer Maintenance II	This course builds on the skills introduced in Computer Maintenance I. Students learn how to connect and install multiple computers and peripherals together to create a computer network. Students build, configure, and maintain network servers along with installing and configuring various network operating systems such as Novell, Windows, and Linux. Students learn to use troubleshooting services, system monitoring utilities, and data backup and recovery systems. Other topics include learning how to connect various network components such as servers, computers, and printers together using data cabling, hubs, and switches. Students learn to run, terminate, and troubleshoot data cabling. In addition, students learn how to install and upgrade software across the network, as well as map drives and share resources such as printers, software, and files. The course includes setting up and configuring various network services such as TCP/IP, DHCP, DNS, VPN, terminal services, e-mail, and web services. Students learn how to secure and protect network servers and data as well as setting up and configuring a firewall, intrusion detection system, and encryption software for identifying and preventing potential network attacks.
Group 4	21008A001	Digital Electronics	Digital Electronics courses teach students how to use applied logic in the development of electronic circuits and devices . Students may use computer simulation software to design and test digital circuitry prior to the actual construction of circuits and devices.
Group 5	**10998A002**	**Information Technology Workplace Experience**	**Information Technology Workplace Experience courses provide students with work experience in fields related to the Information Technology Cluster. Goals must be set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses must include classroom instruction at least once per week, involving further study of the field, discussion of relevant topics that are responsive to the workplace experience and employability skill development.**

			Workplace Experience courses must be taught by an approved WBL educator-coordinator. These courses should be aligned to a Career Development Experience that could include: Student-led Enterprises; School-based Enterprises; Immersion Supervised Agricultural Experiences; Clinical Experiences in Health Science and Technology programs; Internships; and Apprenticeship programs including Youth Apprenticeships, Pre-apprenticeships, and Registered Apprenticeships.
Group 5	13998A002	Manufacturing Workplace Experience	Manufacturing Workplace Experience courses provide work experience in fields related to the Manufacturing cluster. Goals must be set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses must include classroom instruction at least once per week, involving further study of the field, discussion of relevant topics that are responsive to the workplace experience and employability skill development. Workplace Experience courses must be taught by an approved WBL educator-coordinator. These courses should be aligned to a Career Development Experience that could include: Student-led Enterprises; School-based Enterprises; Immersion Supervised Agricultural Experiences; Clinical Experiences in Health Science and Technology programs; Internships; and Apprenticeship programs including Youth Apprenticeships, Pre-apprenticeships, and Registered Apprenticeships.
Group 5	10198A001	Computer Programming Workplace Experience	Computer Programming Workplace Experience courses provide students with work experience in fields related to computer programming. Goals must be set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses must include classroom instruction at least once per week, involving further study of the field, discussion of relevant topics that are responsive to the workplace experience and employability skill development. Workplace Experience courses must be taught by an approved WBL educator-coordinator. These courses should be aligned to a Career Development Experience that could include: Student-led Enterprises; School-based Enterprises; Immersion Supervised Agricultural Experiences; Clinical Experiences in Health Science and Technology programs; Internships; and Apprenticeship programs including Youth Apprenticeships, Pre-apprenticeships, and Registered Apprenticeships.
Group 5	10998A001	Computer Science Workplace Experience	Computer Science Workplace Experience courses are an approved part of career and technical education program that provide students with work experience in fields related to computer and/or information sciences. Goals must be set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses must include classroom instruction at least once per week, involving further study of the field, discussion of relevant topics that are responsive to the workplace experience and employability skill development. Workplace Experience courses must be taught by an approved WBL educator-coordinator. These courses should be aligned to a Career Development Experience that could include: Student-led Enterprises; School-based Enterprises; Immersion Supervised Agricultural Experiences; Clinical Experiences in Health Science and Technology programs; Internships; and Apprenticeship programs including Youth Apprenticeships, Pre-apprenticeships, and Registered Apprenticeships.
Group 5	10248A001	Web Page and Media Design Workplace Experience	Web Page and Media Design Workplace Experience courses provide students with work experience in fields related to web page and media design. Goals must be set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses must include classroom instruction at least once per week, involving further study of the field, discussion of relevant topics

			that are responsive to the workplace experience and employability skill development. Workplace Experience courses must be taught by an approved WBL educator-coordinator. These courses should be aligned to a Career Development Experience that could include: Student-led Enterprises; School-based Enterprises; Immersion Supervised Agricultural Experiences; Clinical Experiences in Health Science and Technology programs; Internships; and Apprenticeship programs including Youth Apprenticeships, Pre-apprenticeships, and Registered Apprenticeships.
Group 5	**10148A001**	**Networking Systems Workplace Experience**	Networking Systems Workplace Experience courses provide students with work experience in fields related to networking systems. Goals must be set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses must include classroom instruction at least once per week, involving further study of the field, discussion of relevant topics that are responsive to the workplace experience and employability skill development. Workplace Experience courses must be taught by an approved WBL educator-coordinator. These courses should be aligned to a Career Development Experience that could include: Student-led Enterprises; School-based Enterprises; Immersion Supervised Agricultural Experiences; Clinical Experiences in Health Science and Technology programs; Internships; and Apprenticeship programs including Youth Apprenticeships, Pre-apprenticeships, and Registered Apprenticeships.
Group 5	**13348A001**	**Computer Installation and Repair Workplace Experience**	Computer Installation and Repair Workplace Experience courses provide students with work experience in the fields involving computer repair. Goals must be set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses must include classroom instruction at least once per week, involving further study of the field, discussion of relevant topics that are responsive to the workplace experience and employability skill development. Workplace Experience courses must be taught by an approved WBL educator-coordinator. These courses should be aligned to a Career Development Experience that could include: Student-led Enterprises; School-based Enterprises; Immersion Supervised Agricultural Experiences; Clinical Experiences in Health Science and Technology programs; Internships; and Apprenticeship programs including Youth Apprenticeships, Pre-apprenticeships, and Registered Apprenticeships.