

Computer Science (Associate of Applied Science)

This program is designed to prepare students for networking and information technology careers in industry and business. The curriculum provides exposure to PC troubleshooting, applications, operating systems, programming, network administration, and the basic components of network security. General education courses such as English Composition and Critical Thinking are included to ensure students' obtaining a well-rounded education.

Course #	Course Title	Lecture	Lab	Externship	Credit
MAT201	Pre-Calculus	40			4
CPS102	Computer Science II	40			4
CPS103	Operating System Fundamentals	40			4
CPS111	Introduction to Internet	40			4
CPS121	Introduction to Database	40			4
CPS122	Introduction to C/C++ Programming	40			4
CPS123	Introduction to Java Programming	40			4
CPS131	Spreadsheets	40			4
CPS132	Advanced Operation System	40			4
CPS133	Introduction to Computer Security and Information Assurance	40			4
CPS201	Advanced Internet	40			4
CPS202	Machine Architecture and Organization	40			4
CPS211	Windows Server	40			4
CPS221	Database Programming	40			4
CPS222	Visual Programming	40			4
CPS231	Web Application Development	40			4
CPS232	Computer Science and Technologies Seminar I	40			4
CPS233	Computer Science and Technologies Seminar II	40			4
CPS270	Career Development	40			4
BIO102	Introduction to Biology	40			4
BPS102	Business and Professional Speech	40			4
CPS101	Computer Science I	40			4
CRT101	Critical Thinking	40			4
ENG101	Composition I	40			4
MAT101	Algebra	40			4
PSY101	Introduction to Psychology	40			4
	Required Hours and Credits	920			92

- **MAT201 Pre-Calculus** - The introductory topics of this course include limits and continuity of functions, derivatives of functions, the definite integral, and their real-world applications. Students find derivatives numerically, represent derivatives graphically, and interpret the meaning of a derivative in applications. Previously studied functions are analyzed using calculus concepts.
- **CPS102 Computer Science II** – This course offers a survey of the disciplines of computer science including history of computing, assembly language, high level programming language, machine logic and circuits, the Turing machine, artificial intelligence, Unix operating system, Internet basics, and web page design.
- **CPS103 Operating System Fundamentals** – This course emphasizes basic operating system design concepts, data structures and algorithms, and systems programming basics. It focuses on structure of computer operating system, database process and management and network and security.
- **CPS111 Introduction to Internet** – Introduction to the Internet. Topics include: address and URL to find your way, linking to a URL, HTML and Web programming, building a Web page, building a home page, client-server techniques -- web page design, blog, bulletin board.
- **CPS121 Introduction to Database** – This course introduces database design and creation and its emphasis is on data dictionaries, normalization, data integrity, data modeling, and creation of simple tables, queries, reports, and forms. Upon completion, students should be able to design and implement normalized database structures by creating simple database tables, queries, reports, and forms.
- **CPS122 Introduction to C/C++ Programming** – This course introduces students to C++ syntax and various programming techniques such as decisions, loops, arrays, pointers, functions, and file processing. It covers object-oriented concepts such as data abstraction, classes, objects, overloading, and inheritance. Students complete required computer lab assignments.
- **CPS123 Introduction to Java Programming** – This is a beginning course in the Java programming language. Students will learn object-oriented programming, and will create applets which can be incorporated into HTML documents for the World Wide Web.
- **CPS131 Spreadsheets** – This course introduces students to Microsoft Excel software, a popular accounting tool. It focuses on planning, creating and editing spreadsheets used in accounting, including the use of functions, macros, graphs and what-if analysis.
- **CPS132 Advanced Operation System** – This course focuses on file system and management and security of the computer. Topics include management of virtual memory, device, and file. Other topics are process synchronization, process communication, and user process and its protection.

- **CPS133 Introduction to Computer Security and Information Assurance** – Introduction to key concepts of computer security: risk analysis, basic cryptography, operating system security, network security concepts, and database security concepts. Related policy issues such as privacy and intellectual property.
- **CPS201 Advanced Internet** – This course introduces programming for the Internet using HTML, JavaScript, and Perl, CGI, and database programming with Perl. Database concepts such as relational versus object oriented database technologies, querying data using SQL. It also covers interfacing databases to the Web, e-commerce, and emerging trends such as XML.
- **CPS202 Machine Architecture and Organization** – Introduction to hardware/software components of a computer system: data representation, boolean algebra, machine-level programs, instruction set architecture, processor organization, memory hierarchy, virtual memory, compiling, linking, and programming in C.
- **CPS211 Windows Server** – This course introduces Managing and Maintaining Physical and Logical Devices such as managing basic disks and dynamic disks, monitoring server hardware (Tools might include Device Manager, the Hardware Troubleshooting Wizard, and appropriate Control Panel items.), optimizing server disk performance, troubleshooting server hardware devices, and installing and configuring server hardware devices.
- **CPS221 Database Programming** – Data structures used in computer programming and algorithms. Use of tree structures, arrays, lists, stacks, files, strings, and linked structures. Sorting, searching, hashing, and merging of data. Performance of algorithms using different data structures.
- **CPS222 Visual Programming** – This course covers how to write programs for the Windows programming environment, including developing an application, tools, forms, the user interface, programming, built-in functions, procedures, arrays, records, testing, and debugging.
- **CPS231 Web Application Development** – This course brings together all of the elements of web site design, graphics, animation, data storage in the construction of fully functional commercial web site applications. The use of industry standard software products and end to end construction will be emphasized.
- **CPS232, CPS233 Computer Science and Technologies Seminar I, II** – Students work for college credit in a professional environment related to their particular track in the computer science and technologies program. The intent is to give students an appropriate work experience that will expand their knowledge and aid them in making career decisions.

- **CPS270 Career Development** - This course provides the opportunity for documenting career skills and articulating career plans. Students also analyze trends and opportunities in their targeted careers, and reflect on learning experiences in their field of study.

General Education Requirements

In addition to the designated courses outlined for each specific field, students seeking an Associate Degree must complete additional general education courses. The six following courses are four credits each, totaling in 24 credits of general education requirements.

- **BIO102 Introduction to Biology** - This course introduces major concepts of cell biology, including cell physiology and structure, molecular biology, genetics, and evolution. Course is a prerequisite for professional health-science programs.
- **BPS102 Business and Professional Speech** - This course focuses on student's awareness, knowledge and recall, comprehension and understanding, and information used in new and different situations. During the course, student will learn 1) Analysis – examination and categorization of pieces of information, 2) Synthesis – combination of information to create something new, and 3) Evaluation – value judgment supported by reasoning.
- **CPS101 Computer Science I** - It studies fundamental computer concepts and methods of object-oriented program development and design. The course also covers language systems and semantics, structured program verification, different language paradigms, and documentation techniques. Students use a structured, high-level object-oriented programming language and learn to use both text-oriented and windows-based user interfaces.
- **CRT101 Critical Thinking** - This course enables the student to identify logical fallacies in selected readings including things written by their classmates and by themselves, demonstrate the capacity for self-critique through the writing of a paper in which they identify alternative assumptions that would lead to different conclusions, and assess the advantages and disadvantages of alternative formulations of any argument. It also teaches to identify and analyze a recent ethical lapse that occurred in a business organization, the nature of the lapse, and provide a possible explanation for the lapse and alternative solutions to prevent similar lapses.
- **ENG101 College Composition** - Through the course, students will learn to write a professional-quality resume, memo, and letter, identify, analyze, and emulate some basic features of a professional report/article typical for their major field. This course also teaches follow the guidelines and do appropriate research to submit a basic grant proposal, use writing to reflect upon the significance of business, technological, and industrial activity for local and global economies, local and global cultures, human health, and the environment, and articulate their response to ethical issues raised by professional practices.

- **MAT101 Algebra** - This course concentrates on making students understand the study skills for success in mathematics and using a calculator, able to set and other basic concepts, and understand the properties of and operations with real numbers.
- **PSY101 Introduction to Psychology** - This course summarizes accountable terminal objectives, explain and give names associated with the major psychology theories, and biological and environmental factors play a role in shaping behavior and development. Students will learn to distinguish between and apply principles of classical conditioning, operant conditioning, and cognitive learning, name and describe stage theories of development relative to physical, cognitive, and psychosocial issues and correctly identify the theorist associated with each, and define abnormal behavior and support the definition, provide examples of situations where counseling or treatment could be advised or necessary.