# Associate of Science with Emphasis in Information Systems Technology

The national and regional job outlook and earnings for careers in information technology continue to be strong. Employees in this sector may possess a diverse or concentrated background in areas such as software and hardware development, mobile computing, data storage and analysis, information security, system administration and integration, computer networking, mathematics and science.

Students completing the Associate of Science (AS) emphasis in Information Systems Technology will be prepared with a diverse set of skills that include the fundamentals of software development. They can then transfer credits seamlessly to the University of Kansas, Edwards campus, to complete a Bachelor of Science in Information Technology in two additional years. Completion of the AS degree may help students obtain internships or entry-level jobs as they complete their bachelor's degree.

Cultural Diversity Course Requirement at JCCC (http://catalog.jccc.edu/fall/degreecertificates/electives/cultural-diversity-courses-aa)

(Major Code 2940; State CIP Code 24.0101)

## Associate of Science

### First Semester

| | | |
|---|---|---|
| CS 134 | Programming Fundamentals | 4 |
| ACCT 121 | Accounting I | 3 |
| SPD 121 | Public Speaking | 3 |
| MATH 171 | College Algebra* | 3 |
| ENGL 121 | Composition I* | 3 |
| Total Hours | | 16 |

### Second Semester

| | | |
|---|---|---|
| ENGL 122 | Composition II* | 3 |
| CS 200 | Concepts of Programming Algorithms Using C++* | 4 |
| CIS 204 | UNIX Scripting and Utilities* | 3 |
| BIOL 135 | Principles of Cell and Molecular Biology | 4-5 |
| or CHEM 124 & CHEM 125 | General Chemistry I Lecture* and General Chemistry I Lab | |
| Humanities Elective ^ | | 3 |
| Note: Ethics is recommended as one of the two humanities electives. Humanities electives chosen must transfer to KU, and one of the humanities electives must satisfy the JCCC cultural diversity requirement. | | |
| Total Hours | | 17-18 |

^ Humanities Elective (http://catalog.jccc.edu/fall/degreecertificates/electives/humanities-as)

### Third Semester

| | | |
|---|---|---|
| CIS 235 | | 4 |
| CS 210 | Discrete Structures I* | 3 |
| CIS 260 | Database Management* | 4 |
| PSYC 130 | Introduction to Psychology | 3 |
| ECON 132 | Survey of Economics | 3 |
| Total Hours | | 17 |

### Fourth Semester

| | | |
|---|---|---|
| CS 250 | Basic Data Structures using C++* | 4 |
| CS 211 | Discrete Structures II* | 3 |
| PHYS 130 | College Physics I* | 5 |
| Health and/or Physical Education Elective ^ | | 1 |

| | |
|---|---|
| Humanities Elective ^^ | 3 |
| Note: Ethics recommended as one of the two humanities electives. Humanities electives chosen must transfer to KU, and one of the humanities electives must satisfy the JCCC cultural diversity requirement. | |
| Total Hours | 16 |

^ Health and/or Physical Education Elective (http://catalog.jccc.edu/fall/degreecertificates/electives/health-and-or-physical-ed-as)

^^ Humanities Elective (http://catalog.jccc.edu/fall/degreecertificates/electives/humanities-as)

**Total Program Hours: 66-67**

## Courses

**CS 134 Programming Fundamentals (4 Hours)**
In this introductory course, students will create interactive computer applications that perform tasks and solve problems. Students will utilize fundamental logic, problem-solving techniques and key programming concepts to design, develop and test modular applications written in an object-oriented programming language. 3 hrs. lecture, 2 hrs. lab /wk.

**CS 200 Concepts of Programming Algorithms Using C++* (4 Hours)**
**Prerequisites:** CS 134 with a grade of "B" or higher or CS 201 or CS 205 or MATH 241or appropriate score on waiver test or department approval for prior work-related experience

This course emphasizes problem solving using a high level programming language and the software development process. Algorithm design and development, programming style, documentation, testing and debugging will be presented. Standard algorithms and data structures will be introduced. Data abstraction and an introduction to object-oriented programming will be studied and used to implement algorithms. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.

**CS 200H HON: Concepts/Prog. Algorithms (1 Hour)**
One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**CS 201 Concepts of Programming Algorithms using C#* (4 Hours)**
**Prerequisites:** CIS 134 or CS 134 or ENGR 171 or equivalent experience

This course emphasizes programming methodology and problem-solving using C#. Algorithm design and development, data abstraction, good programming style, testing and debugging will be presented. 3 hrs. lecture, 2 hrs. open lab/wk.

**CS 205 Concepts of Programming Algorithms using Java* (4 Hours)**
**Prerequisites:** CIS 134 or CS 134 or ENGR 171 or equivalent experience

This course emphasizes programming methodology and problem-solving using Java. Algorithm design and development, data abstraction, good programming style, testing and debugging will be presented. 3 hrs. lecture, 2 hrs. open lab/wk.

**CS 210 Discrete Structures I* (3 Hours)**
**Prerequisites:** MATH 171 or both MATH 116 and CIS 134 or CS 134 or appropriate math assessment scores

Upon successful completion of this course, the student should be able to use fundamental discrete mathematics as it relates to computers and computer applications. The student will be exposed to a variety of discrete mathematical topics. The course will include fundamental mathematical principles, combinatorial analysis, mathematical reasoning, graphs and trees, and Boolean logic circuits. 3 hrs. lecture/wk.

**CS 210H HON: Discrete Structures I (1 Hour)**
One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**CS 211 Discrete Structures II* (3 Hours)**
**Prerequisites:** CS 210

Upon successful completion of this course, the student should be able to use fundamental discrete mathematics as it relates to computers and computer applications. The student will experiment with a variety of discrete mathematical topics. The course will include fundamental mathematical principles, combinatorial analysis, mathematical reasoning, graphs and trees, and Boolean logic circuits. 3 hrs. lecture/wk.

**CS 211H HON: Discrete Structures II (1 Hour)**
One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**CS 225 Digital Logic with VHDL* (2 Hours)**
**Prerequisites:** ELEC 125

This course introduces students to the Very High Speed Integrated Circuit Hardware Descriptive Language (VHDL) used to implement digital logic designs with programmable logic devices. Students will learn the different types of programmable logic devices and how to use an industry-standard programming environment to code designs with VHDL. 1hr. lecture & 2 hrs. instuctional lab/wk.

**CS 235 Object-Oriented Programming Using C++* (4 Hours)**
**Prerequisites:** CS 200 or CS 201 or CS 205

This course emphasizes programming methodology and problem solving using the object-oriented paradigm. Students will develop software applications using the object-oriented concepts of data abstraction, encapsulation, inheritance, and polymorphism. Students will apply the C++ techniques of dynamic memory, pointers, built-in classes, function and operator overloading, exception handling, recursion and templates. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.

**CS 236 Object-Oriented Programming Using C#* (4 Hours)**
**Prerequisites:** CS 201

This course prepares students to develop object-oriented, C# applications that solve a variety of problems. Students will apply object-oriented concepts including inheritance, function overloading, and polymorphism and will utilize available classes as well as design their own. Event-driven programming, Windows applications, web development, common data structures, database access, and frameworks will be presented. 3 hrs. lecture, 2 hrs. instructional lab/wk.

**CS 250 Basic Data Structures using C++* (4 Hours)**
**Prerequisites:** (CS 235 or CIS 235) OR CS 200 and (CS 210 or CS 236 or CS 255 or CIS 240 or MATH 242)

This course continues developing problem solving techniques by focusing on object-oriented styles using C++ abstract data types. Basic data structures such as queues, stacks, trees, dictionaries, their associated operations, and their array and pointer implementations will be studied. Topics also include recursion, templates, fundamental algorithm analysis, searching, sorting, hashing, object-oriented concepts and large program organization. Students will write programs using the concepts covered in the lecture. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.

**CS 255 Basic Data Structures Using Java* (4 Hours)**
**Prerequisites:** CS 205 or CS 236 or CIS 240

This course will cover advanced programming topics using Java. Files, recursion, data structures and large program organization will be implemented in projects using object-oriented methodology. Students will write programs using queues, stacks, lists and other concepts covered in the lecture. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.