

## Program Curriculum (2023-24) – Last Update: April 19, 2023

### B.S. CIS

The program's requirements must be consistent with its **program educational objectives** and designed in such a way that each of the **student outcomes** can be attained. The curriculum must combine technical, professional, and general education components to prepare students for a career, further study, and lifelong professional development in the computing discipline associated with the program.

### General Curriculum Criteria (Almost the same for all computing related B.S. Programs) – Covered Mostly by Computing Core Courses

The program includes mathematics appropriate to the discipline and at least 30 semester credit hours of up-to-date coverage of fundamental and advanced computing topics that provide both breadth and depth. The computing topics include:

1. Techniques, skills, and tools necessary for computing practice (CSCI 1010 / CSCI 1011 / CSCI 2000 / CSCI 2010 / CSCI 2011).
2. Principles and practices for secure computing (CSCI 4200).
3. Local and global impacts of computing solutions on individuals, organizations, and society (CSCI 2600 / CSCI 4800).

### Program Specific Curriculum Criteria

#### – Covered by Computing OR Major Core Courses

The curriculum for **Computer Information Systems** meets the following program criteria.

1. Information systems: At least 30 semester credit hours (or equivalent) that include coverage of fundamentals and applied practice in application development (CSCI 1010 / CSCI 1011 / CSCI 2000 / CSCI 2010 / CSCI 2011); data and information management (CSCI 4400); information technology infrastructure (CSCI 3400 / CSCI 2700); systems analysis, design and acquisition (CSCI 4750); project management (CSCI 4603); and the role of information systems in organizations (CSCI 4750).
2. Information systems environment: At least 15 additional semester credit hours (or equivalent) of a cohesive set of topics that provide and understanding of an information systems environment. (**Information Systems Environment (ISE) requirement, choose 1 of two 15-hour focuses**), See [CSIT Dept. Advising Handbook](#)
3. Quantitative analysis or methods that must include statistics (MATH 1530 / CSCI 2500 / MATH 1810 / MATH 1910).

## **B.S. CIT**

The program's requirements must be consistent with its **program educational objectives** and designed in such a way that each of the **student outcomes** can be attained. The curriculum must combine technical, professional, and general education components to prepare students for a career, further study, and lifelong professional development in the computing discipline associated with the program.

### **General Curriculum Criteria (Almost the same for all computing related B.S. Programs) – Covered Mostly by Computing Core Courses**

The program includes mathematics appropriate to the discipline and at least 30 semester credit hours of up-to-date coverage of fundamental and advanced computing topics that provide both breadth and depth. The computing topics include:

1. Techniques, skills, and tools necessary for computing practice (CSCI 1010 / CSCI 1011 / CSCI 1300 / CSCI 2000 / CSCI 2010 / CSCI 2011 / CSCI 3300).
2. Principles and practices for secure computing (CSCI 4200).
3. Local and global impacts of computing solutions on individuals, organizations, and society (CSCI 2600 / CSCI 4800).

### **Program Specific Curriculum Criteria**

#### **– Covered by Computing OR Major Core Courses**

The curriculum for **Computer Information Technology** meets the following program criteria.

(a) Information Technology: At least 45 semester credit hours (or equivalent) that must include:

1. Fundamentals and applied practice in:
  - a. information management (CSCI 4400)
  - b. integrated systems (CSCI 4750)
  - c. platform technologies (CSCI 4760)
  - d. system paradigms (CSCI 4603 / 4750)
  - e. user experience design (CSCI 3350)
  - f. networking (CSCI 2700)
  - g. software development and management (CSCI 4603 / CSCI 4750)
  - h. web and mobile systems (CSCI 1300 / CSCI 3300 / CSCI 3350 / CSCI 4650)
2. Advanced and supplemental IT topics that build on fundamentals and applied practice to provide depth. (CSCI 1300 / CSCI 3300 / CSCI 3350 / CSCI 4650 / CSCI 4750)
3. Experiential learning appropriate to the program (CSCI 3350 / CSCI 4650 / CSCI 4750).
4. Principles and practices of IT project management (CSCI 4603).

(b) Mathematics: At least six semester credit hours (or equivalent) of appropriate mathematical topics (Math 1530 / CSCI 2500) that includes relevant discrete mathematics (CSCI 2500).

## **B.S. CSC**

The program's requirements must be consistent with its **program educational objectives** and designed in such a way that each of the **student outcomes** can be attained. The curriculum must combine technical, professional, and general education components to prepare students for a career, further study, and lifelong professional development in the computing discipline associated with the program.

### **General Curriculum Criteria (Almost the same for all computing related B.S. Programs) – Covered Mostly by Computing Core Courses**

The program includes mathematics appropriate to the discipline and at least 30 semester credit hours of up-to-date coverage of fundamental and advanced computing topics that provide both breadth and depth. The computing topics include:

1. Techniques, skills, and tools necessary for computing practice (CSCI 1010 / CSCI 1011 / CSCI 2000 / CSCI 2010 / CSCI 2011 / CSCI 3005).
2. Principles and practices for secure computing (CSCI 4100 / CSCI 4200).
3. Local and global impacts of computing solutions on individuals, organizations, and society (CSCI 2600 / CSCI 4800).

### **Program Specific Curriculum Criteria – Covered by Computing OR Major Core Courses**

The curriculum for **Computer Science** meets the following program criteria.

1. Computer science: At least 40 semester credit hours (or equivalent) that must include:
  - a. Substantial coverage of algorithms and complexity (CSCI 3250 / CSCI 4270), computer science theory (CSCI 3250 / CSCI 4230), concepts of programming languages (CSCI 4230), and software development (CSCI 1010 / CSCI 2010 / CSCI 2000 / CSCI 3005).
  - b. Substantial coverage of at least one general-purpose programming language (CSCI 1010/2010 / CSCI 2000 / CSCI 3005).
  - c. Exposure to computer architecture and organization (CSCI 3400), information management (CSCI 3250 / CSCI 4400), networking and communication (CSCI 2700 / CSCI 4100), operating systems (CSCI 4100), and parallel and distributed computing (CSCI 4100).
  - d. The study of computing-based systems at varying levels of abstraction. (CSCI 1010 / CSCI 2010 / CSCI 2000 / CSCI 3005 / CSCI 3400 / CSCI 3250).
  - e. A major project that requires integration and application of knowledge and skills acquired in earlier course work. (CSCI 4805).
2. Mathematics: At least 15 semester credit hours (or equivalent) that must include discrete mathematics and must have mathematical rigor at least equivalent to introductory calculus. The additional mathematics might include course work in areas such as calculus, linear algebra, numerical methods, probability, statistics, or number theory. (MATH 1910 / MATH 1920 / MATH 3000 / MATH 3450 / MATH 4670 / STAT 3250 / STAT 4240)
3. At least six semester credit hours (or equivalent) in natural science course work intended for science and engineering majors. This course work must develop an understanding of the scientific method and must include laboratory work. (Natural Science Core for Computer Science)

## **Cybersecurity (for the Future)**

The program's requirements must be consistent with its **program educational objectives** and designed in such a way that each of the **student outcomes** can be attained. The curriculum must combine technical, professional, and general education components to prepare students for a career, further study, and lifelong professional development in the computing discipline associated with the program.

Student Outcomes 1 through 5 (SLO1 to SLO 5), and

**Student Outcome 6 (SLO6-CY):** Apply security principles and practices to maintain operations in the presence of risks and threats. [CY]

### **General Curriculum Criteria (Almost the same for all computing related B.S. Programs) – Covered Mostly by Computing Core Courses**

The program includes mathematics appropriate to the discipline and at least 30 semester credit hours of up-to-date coverage of fundamental and advanced computing topics that provide both breadth and depth. The computing topics include:

1. Techniques, skills, and tools necessary for computing practice (CSCI 1010 / CSCI 1011 / CSCI 2000 / CSCI 2010 / CSCI 2011).
2. Principles and practices for secure computing (CSCI 4200).
3. Local and global impacts of computing solutions on individuals, organizations, and society (CSCI 2600 / CSCI 4800).

### **Program Specific Curriculum Criteria**

#### **– Covered by Computing OR Major Core Courses**

The curriculum for **Cybersecurity** meets the following program criteria.

1. At least 45 semester credit hours (or equivalent) of computing and cybersecurity course work. The course work must include:
  - a. Application of the crosscutting concepts of confidentiality, integrity, availability, risk, adversarial thinking, and systems thinking.
  - b. Fundamental topics from each of the following:
    - i. Data Security: protection of data at rest, during processing, and in transit.
    - ii. Software Security: development and use of software that reliably preserves the security properties of the protected information and systems.
    - iii. Component Security: the security aspects of the design, procurement, testing, analysis, and maintenance of components integrated into larger systems.
    - iv. Connection Security: security of the connections between components, both physical and logical.
    - v. System Security: security aspects of systems that use software and are composed of components and connections.
    - vi. Human Security: the study of human behavior in the context of data protection, privacy, and threat mitigation.
    - vii. Organizational Security: protecting organizations from cybersecurity threats and managing risk to support successful accomplishment of the organizations' missions.
    - viii. Societal Security: aspects of cybersecurity that broadly impact society as a whole.

- c. Advanced cybersecurity topics that build on crosscutting concepts and fundamental topics to provide depth.
  - i. At least 6 semester credit hours (or equivalent) of mathematics that must include discrete mathematics and statistics.