Description
Computer Science Foundations (CSF) is a course intended to provide students with exposure to various information technology occupations and pathways such as Networking Systems, Coding, Web Design, and Cybersecurity. Upon completion of this course, proficient students will be able to describe various information technology (IT) occupations and professional organizations. Moreover, they will be able to demonstrate logical thought processes and discuss the social, legal, and ethical issues encountered in the IT profession. Depending on the focus area, proficient students will also demonstrate an understanding of electronics and basic digital theory; project management and teamwork; client relations; causes and prevention of Internet security breaches; and writing styles appropriate for web publication. Upon completion of the CSF course, students will be prepared to make an informed decision about which Information Technology program of study to pursue.

Student Learning Outcomes

Safety
1) Perform safe practices within the classroom
   a. Accurately read and interpret safety rules, including but not limited to rules pertaining to electrical safety, Occupational Safety and Health Administration (OSHA) guidelines, internet safety, and state and national code requirements
   b. Identify and explain the intended use of safety equipment available in the classroom.
   c. Demonstrate how to properly inspect, use, and maintain safe operating procedures with tools and equipment
   d. Incorporate safety procedure

Career & Education Opportunities
2) Identify various fields within information technology and their respective career opportunities.
   a. Recognize the work typically performed, tools and technology used, and nature of work environment
   b. Identify potential certification opportunities
   c. Find membership organizations associated with the careers
   d. Understand the necessary education associated within the careers
   e. Research security clearance requirements associated within the careers

Electronics and Basic Digital Technology
3) Demonstrate basic understanding of electrical circuits and devices
4) Distinguish between the binary and hexadecimal counting systems
   a. Use appropriate units
   b. Provide examples of each system within the IT setting
5) Explain the functions of gates in logistic circuits
6) Identify basic hardware components and their functions
   a. Hardware used for input and output
   b. Hardware inside the computer case
c. Motherboard

d. Processor and the chipset

e. Storage devices

f. Expansion cards

g. Electrical system

The Internet

7) Outline the evolution of the internet

8) Explain basic web terminology and concepts
   a. Server
   b. Domain name system (DNS)
   c. Internet service provider (ISP)
   d. Hardware and software connective devices
   e. Cloud computing
   f. Remote access protocols
   g. Map protocols
   h. Content management systems (CMS)
   i. Cascading style sheets (CSS)
   j. Social networking terms

Operating Systems

9) Compare and contrast the general capabilities of a variety of operating systems
   a. Summarize the evolution of operating systems

10) Explain the types of networks and what a client-server environment is

Cloud Computing

11) Evolution of cloud computing

12) Identify roles in cloud computing
   a. Cloud computing customer
   b. Cloud service provider
   c. Cloud service partner

13) Four main deployment models for cloud technology
   a. Public
   b. Private
   c. Community
   d. Hybrid

14) Describe how virtualization, storage, networking, and databases in cloud technologies are used

15) Internet of Things

16) Databases, data collection systems, data analytics and other strategies that optimize statistical efficiency quality

Web Design

17) Explain the steps of the web design and development process

18) Identify the specific activities involved at each step of the troubleshooting process

19) Create a flowchart that would guide code development that incorporates decisions and/or paths to solve a problem

20) Explain various roles and responsibilities for members of a web design and development team

21) Synthesize common principles and templates for successful project management

22) Identify the skills that are required to communicate effectively with a client

23) Identify appropriate writing techniques and style for web publications
24) Given a specific client’s vision, create a simple web site using a content management system
25) Research various social, legal, and ethical issues encountered by IT professionals.
   a. Copyright laws
   b. Open source software
26) Organization of Materials
   a. Demonstrate effective use of file and folder management techniques to maintain directory structures for a web site.

Cybersecurity
27) Determine security fundamentals on confidentiality, availability, and integrity
28) Identify various security breaches that can occur with the internet
29) Enterprise-level security
30) Encryption
31) Protocols that can be implemented to secure web sites
32) Compare and contrast personal privacy issues versus employers’ rights to regulate computing resources
33) Identify various security practices for computer and network systems
   a. Controlled access to secure resources and computer resources
   b. Encryption techniques
   c. Basic input/output systems (BIOS) features
   d. Strategies for dealing with malware

Programming
34) Explain why various languages exist.
35) Explain the steps involved in the software development life cycle and why it is iterative