# Computing Systems Course No. 10002/60002 Credit: 1.0

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| **Student name:** |  | **Graduation Date:** |  |

Pathways and CIP Codes:Information Support & Services (11.0301); Network Systems (11.090); Programming & Software Development (11.0201); Web & Digital Communications (11.1004)

Course Description: **Introductory Level:** Computing Systems courses offer a broad exploration of the use of computers in a variety of fields. These courses have a considerable range of content, but typically include the introduction of robotics and control systems, computer-assisted design, computer-aided manufacturing systems, and other computer technologies as they relate to industry applications.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Overview of Systems

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Identify computer classifications and hardware. i. Identify types of computer storage devices. ii. Identify major hardware components and their functions. iii. Identify the different types of computing devices. |  |
| 1.2 | Identify new IT technologies and assess their potential importance and impact on the future. |  |
| 1.3 | Identify new & emerging drivers and inhibitors of information technology change. |  |
| 1.4 | Operate computer-driven equipment and machines. |  |
| 1.5 | Apply knowledge of operating systems principles to ensure optimal functioning of system. |  |
| 1.6 | Understand data communications trends and issues. |  |
| 1.7 | Demonstrate knowledge of data transmission codes and protocols. |  |
| 1.8 | Understand elements and types of information processing. (i.e., input, process, output). (e.g., batch, interactive, event- driven, object-oriented). |  |

## Benchmark 2: Computer Operations

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Identify and understand the fundamentals of operating systems and their components. |  |
| 2.2 | Configure systems to provide optimal system interfaces |  |
| 2.3 | Clearly document step-by-step installation procedures for future use and configuration. |  |
| 2.4 | Apply concepts of privileged instructions and protected mode programming. |  |
| 2.5 | Configure peripheral device drivers (e.g., disk, display, printer, modem, keyboard, and mouse). |  |
| 2.6 | Allocate disk space, non-sharable resources, and I/O devices. |  |
| 2.7 | Interface peripheral devices/controllers in the computer system (e.g., software and hardware interrupts, exceptions, Direct Memory Addressing [DMA], bus structures). |  |
| 2.8 | Identify standards and issues related to I/O programming and design of I/O interfaces. |  |
| 2.9 | Define hardware-software interface issues for a computer system. |  |
| 2.10 | Review automated scheduling software and Identify scheduling priority in programming. |  |
| 2.11 | Document procedures and actions through development of audit trails. |  |

## Benchmark 3: Hardware

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Ensure that hardware and software system components are compatible and licensed prior to performing installation. |  |
| 3.2 | Evaluate systems engineering considerations. |  |
| 3.3 | Demonstrate knowledge of how bandwidths affect data transmission and on-screen image. |  |
| 3.4 | Evaluate information systems problem-solving techniques and approaches. |  |
| 3.5 | Determine the accuracy and completeness of the information gathered. |  |
| 3.6 | Explain data communications procedures, equipment and media. |  |
| 3.7 | Explain measurement techniques for increased productivity due to information systems implementation. |  |
| 3.8 | Explain the differences between local and wide area networks. |  |
| 3.9 | Explain the benefits of hosting a web site on a local server vs. at an ISP (Internet Service Provider). |  |
| 3.10 | Troubleshoot computer-driven equipment and machines and access support as needed (e.g. Test system using diagnostic tools/software, repair/replace malfunctioning hardware and reinstall software as needed, recover data and/or files and restore system to normal operating standards.) |  |

## Benchmark 4: Software

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Determine software design process, from specification to implementation and appraise software process and product life cycle models. |  |
| 4.2 | Explain new and emerging classes of software. |  |
| 4.3 | Explain the key functions and applications of software. |  |
| 4.4 | Demonstrate knowledge of the function and operation of compilers and interpreters. |  |
| 4.5 | Demonstrate knowledge of widely used software applications (e.g., word processing, database management, spreadsheet development, publishing software) |  |
| 4.6 | Demonstrate an understanding of various programming paradigms (OO, functional, logic) in software development |  |
| 4.7 | Demonstrate knowledge of how data is organized in software development: source version data, project progress data, etc. to increase individual efficiency and respect team member data. |  |
| 4.8 | Explain the features and functions of how web browsing software affects the look of a web page, consider the characteristics and uses of plug- ins and examine role of browsers in reading files on the World Wide Web (text-only, hypertext). |  |
| 4.9 | Explain the role of number systems in information systems and internal data representation. |  |
| 4.10 | Identify the role the binary system in information systems. |  |

## Benchmark 5: Serving the needs of the end user

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Communicate to understand the problem the user wants to solve independent of the technology (empathy). Consider develop context awareness -- consider the context of the user and the problem before proposing a solution. |  |
| 5.2 | Perform software customization as requested to meet the needs of the end user. |  |
| 5.3 | Perform installation accurately and completely, using available resources as needed. |  |
| 5.4 | Resolve problems with installation if they occur. |  |
| 5.5 | Test and maintain products /services. |  |
| 5.6 | Initiate predictive maintenance procedures. |  |
| 5.7 | Consider customer satisfaction in determining product characteristics (e.g., usefulness, price, operation, life, reliability, safety, and cost of operation) |  |
| 5.8 | Use available reference tools (e.g., procedural manuals, documentation, standards, and work flowcharts) as appropriate to access needed information. |  |
| 5.9 | Use installation/operation manuals to access needed information using appropriate reference materials |  |
| 5.10 | Use reliability factors (e.g., cost, human, productivity) to plan for and create products/ services; with consideration of maintainability, good design, design simplification, and design redundancy. |  |
| 5.11 | Demonstrate knowledge of critical thinking skills, decision-making skills and develop a plan using data-oriented techniques. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

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