# Technical Introduction to Computer Science Course No. 41010 Credit: 1.0

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

Pathways and CIP Codes:Programming & Software Development (11.0201)

Course Description: **Technical Level:** Students develop an understanding of computer science concepts and use computational thinking skills to solve problems through a variety of programming languages and platforms. Students also develop skills in collaboration and teamwork using work models such as pair programming. This course provides a rich technical foundation for continued study

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: Click or tap here to enter text.

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Design and develop a software artifact working in a team. |  |
| 1.2 | Compare and contrast various software licensing schemes (e.g., open source, freeware, commercial). |  |
| 1.3 | Design, develop, and implement a computing artifact that responds to an event (e.g., robot that responds to a sensor, mobile app that responds to a text message, sprite that responds to a broadcast). |  |
| 1.4 | Use user - centered research and design techniques (e.g., surveys, interviews) to create software solutions. |  |
| 1.5 | Integrate grade-level appropriate mathematical techniques, concepts, and processes in the creation of computing artifacts. |  |
| 1.6 | Deconstruct a complex problem into simpler parts using predefined constructs (e.g., functions and parameters and/or classes) |  |
| 1.7 | Demonstrate the value of abstraction for managing problem complexity (e.g., using a list instead of discrete variables). |  |
| 1.8 | Design algorithms using sequence, selection, and iteration. |  |
| 1.9 | Use a systematic approach and debugging tools to independently debug a program (e.g., setting breakpoints, inspecting variables with a debugger). |  |
| 1.10 | Convert between binary, decimal, and hexadecimal representations of data (e.g., convert hexadecimal color codes to decimal percentages, ASCII/Unicode representation). |  |
| 1.11 | Debate the social and economic implications associated with ethical and unethical computing practices (e.g., intellectual property rights, hacktivism, software piracy, diesel emissions testing scandal, new computers shipped with malware). |  |
| 1.12 | Compare and debate the positive and negative impacts of computing on behavior and culture (e.g., evolution from hitchhiking to ridesharing apps, online accommodation rental services). |  |
| 1.13 | Compare and contrast multiple viewpoints on cybersecurity (e.g., from the perspective of security experts, privacy advocates, the government) |  |
| 1.14 | Explain the principles of information security (confidentiality, integrity, availability) and authentication techniques. |  |
| 1.15 | Use simple encryption and decryption algorithms to transmit/receive an encrypted message. |  |

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

Instructor Signature:

For more information, contact:

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