NH Computer and Information Sciences, General. 

CIP#: 11.0101

# Algorithms and Programming

* Create meaningful and efficient programs including choosing which information to use and how to process and store it, breaking apart large problems into smaller ones, recombining existing solutions, and analyzing different solutions.

| **Skill/Knowledge** | **Applying**  **(4) Reasoning** | **Proficient**  **(3)** | **Developing**  **(2 - 1) Reasoning** | |
| --- | --- | --- | --- | --- |
| **Design**  I can create user-centered designs that effectively address requirements and enhance user experience. |  | * I can identify user needs and preferences to inform design decisions. * I can apply design principles such as consistency, hierarchy, and usability. * I can create prototypes and iterate based on feedback. * I can effectively communicate design decisions to stakeholders. |  | |
| **Project Management**  I can efficiently plan, execute, and monitor projects to achieve objectives within scope, budget, and timeline. |  | * I can define project goals, scope, and deliverables. * I can create detailed project plans and schedules. * I can allocate resources effectively and manage risks. * I can monitor progress and adapt plans as needed. * I can communicate project status and updates to stakeholders. |  | |
| **Data Structures**  I can select and implement appropriate data structures to efficiently store and manipulate data. |  | * I can explain the characteristics and use cases of common data structures (e.g., arrays, linked lists, trees). * I can analyze problems and choose the most suitable data structure. * I can implement data structures using appropriate programming languages. * I can evaluate the efficiency and performance of data structures in different scenarios. |  | |
| **Programming Concepts**  I can apply programming concepts effectively to solve complex problems and develop scalable solutions. |  | * I can demonstrate proficiency in programming languages commonly used in the field. * I can write clean, modular, and maintainable code. * I can apply algorithms and data structures to solve problems efficiently. * I can identify sequence, selection and control statements within my code. |  | |
| **Documentation**  I can create clear and comprehensive documentation that effectively communicates technical information to different stakeholders. |  | * I can document project requirements, design decisions, and implementation details. * I can create user manuals, API documentation, and technical specifications. * I can ensure documentation is organized, concise, and easy to understand. * I can update documentation to reflect changes and improvements in the project. |  | |
| **Debugging**  I can identify and resolve software defects efficiently using systematic debugging techniques. |  | * I can analyze code to identify the root cause of bugs. * I can use debugging tools effectively to trace and monitor program execution. * I can apply strategies such as code reviews and unit testing to prevent and detect bugs. * I can communicate debugging processes and solutions clearly to team members. |  | |