# Software Development, AAS

| Program Learning Outcomes (PLOs) | Measurable Student Learning Outcomes (MSLOs)- PLO Alignment | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CIS112 | CIS115 | CIS120 | CIS121 | CIS123 | CIS162 | CIS176 | CIS178 | CIS213 | CIS216 | CIS218 | CIS231 | CIS233 |
| 1. (Synthesis Level) Plan and implement technology solutions. (CSLO 4) | ✓ | | | | ✓ | ✓ | ✓ | | | | | | |
| 2. (Comprehension Level) Identify common hardware components of computer systems and describe their uses. (CSLO 2) | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| 3. (Comprehension Level) Identify and explain the hardware and software components of computers. (CSLO 2) | ✓ | | | | ✓ | ✓ | ✓ | | | | | | |
| 4. (Knowledge Level) Define various local area network topologies and communication standards. (CSLO 3) | | | | | ✓ | | | | | | | ✓ | ✓ |
| 5 (Application Level) Use Java data structures and the Java collection framework to solve problems. (CSLO 3) | | | ✓ | | | ✓ | | ✓ | | | | | |
| 6. (Synthesis Level) Code elementary programs in the C++, Python, C#, Ruby, and Java programming languages, utilizing input and output options, data types, decision-making techniques, structures, classes, and disk file operations. (CSLO 3) | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| 7. (Analysis Level) Analyze programs for errors. (CSLO 4) | | | | | | | | | | | | | |
| 8. (Application Level) Complete DNS Configuration on a Windows Server. (CSLO 3) | | | | | | | | | | | | | |
| 9. (Synthesis Level) Produce web pages that retain users. (CSLO 3) | ✓ | ✓ | ✓ | | | | | | | | | | |
| 10. (Application Level) Use current object-oriented design and programming techniques to build complex programs working as a team. (CSLO 3) | | | | | | | | | | | | | |
| 11. (Analysis Level) Examine and explain the role of business economics in creating and distributing wealth and its stakeholders. (CSLO 2) | | | | | | | | | | | | | |
| 12. (Synthesis Level) Write standard business messages (i.e. memos, e-mail, inquiries, replies to inquiries, orders, credit and collection messages, claim, and adjustment messages). (CSLO 3) | | | | | | | | | | | | | |
| 13. (Comprehension Level) Describe the relational database model. (CSLO 2) | | | | | | | | | | | | | |
| 14. (Application Level) Implement simple and complex queries with Structured Query Language (SQL). (CSLO 3) | | | | | | | | | | | | | |
| 15. (Comprehension level) Discuss ethical and social issues of the computing world. (CSLO 1) | ✓ | | ✓ | | | | | | | | | | |
| 16. (Synthesis Level) Create interfaces with HTML and PHP. | | | | | | | | | | | | | |

## Computer Programming Certificate

| Program Learning Outcomes (PLOs) | Measurable Student Learning Outcomes (MSLOs)- PLO Alignment | | | | |
|---|---|---|---|---|---|
| | CIS112 | CIS120 | CIS123 | CIS178 | CIS216 |
| 1. (Synthesis Level) Plan and implement technology solutions. (CSLO 4) | ✓ | ✓ | | | |
| 2. (Synthesis Level) Code elementary programs utilizing input and output options, data types, decision-making techniques, structures, classes, and disk file operations. (CSLO 3) | ✓ | ✓ | ✓ | | ✓ |
| 3. (Analysis Level) Analyze programs for errors. (CSLO 4) | ✓ | ✓ | ✓ | | |
| 4. (Application Level) Produce web interfaces. (CSLO 3) | ✓ | ✓ | | | ✓ |
| 5. (Comprehension Level) Describe the relational database model. (CSLO 2) | ✓ | ✓ | | ✓ | |
| 6. (Application Level) Implement simple and complex queries with Structured Query Language (SQL). (CSLO 3) | | ✓ | ✓ | ✓ | ✓ |
| 7. (Comprehension level) Discuss ethical and social issues of the computing world. (CSLO 1) | ✓ | ✓ | ✓ | ✓ | ✓ |

# Software Development Certificate

| Program Learning Outcomes (PLOs) | Measurable Student Learning Outcomes (MSLOs)- PLO Alignment | | | | |
|---|---|---|---|---|---|
| | CIS162 | CIS176 | CIS213 | CIS218 | CIS231 |
| 1. (Synthesis Level) Code elementary programs in the C++, Python, C#, and Java programming languages, utilizing input and output options, data types, decision-making techniques, structures, classes, and disk file operations. (CSLO 3) | ✓ | ✓ | | ✓ | |
| 2. (Analysis Level) Analyze programs for errors. (CSLO 4) | ✓ | ✓ | | ✓ | ✓ |
| 3. (Application Level) Use current object-oriented design and programming techniques to build complex programs working as a team. (CSLO 3) | | | | ✓ | ✓ |
| 4. (Comprehension level) Discuss ethical and social issues of the computing world. (CSLO 1) | | | | ✓ | |
| 5. (Knowledge Level) Identify common uses of Linux in deployed business computer solutions CSLO 3) | | | ✓ | | ✓ |
| 6. (Synthesis Level) Develop well designed and well documented programs that are easily maintainable. (CSLO 3) | ✓ | ✓ | | | |

# Database Technician Certificate

| Program Learning Outcomes (PLOs) | Measurable Student Learning Outcomes (MSLOs)- PLO Alignment | | | | |
|---|---|---|---|---|---|
| | CIS120 | CIS121 | CIS123 | CIS178 | CIS216 |
| 1. (Synthesis Level) Create programs that use the fundamental program constructs including standard conditional and iterative control structures. (CSLO 3) | ✓ | | ✓ | | ✓ |
| 2. (Application Level) Apply documentation techniques throughout the program development cycle. (CSLO 3) | | | ✓ | | ✓ |
| 3. (Comprehension level) Locate and correct syntax and logic errors in short programs. (CSLO 4) | | | | | ✓ |
| 4. (Comprehension Level) Discuss ethical and social issues of the computing world. (CSLO 1) | ✓ | | ✓ | | |
| 5. (Application Level) Use modern techniques of database organization and access in a database environment. (CSLO 3) | ✓ | | | ✓ | |
| 6. (Synthesis Level) Create Java solutions for given business problems that apply the structural features of Java programming which include objects, classes, methods, inheritance, and input/output functions. (CSLO 3) | | | ✓ | | ✓ |
| 7. (Synthesis Level) Develop programs that insert, update, and query data in a relational database. (CSLO 3) | | | | | |