Program SLOs
Computer Information Science

A.S. Degrees in CIS – Computer Science, Information Systems Security, Server Administrator, Enterprise Administrator
A.S. Degree – Management Information Systems
Certificates of Achievement in CIS – Computer Programmer (SQL), Relational Database Administration, Web Programming, Server Administrator, Enterprise Administrator, Programming C/C++, Internet Programming, Information Systems Security
Certificates of Achievement in MIS – Information Processing, Application Technician, Application Analyst, Application Manager
Certificates of Proficiency in CIS – Database Analyst (SQL), Database Design, Software Development Using Visual BASIC.NET, Software Development with JAVA, Web Publishing, Network Helpdesk Technician, Linux System Administrator
Certificates of Proficiency in MIS – Application Data Entry, E-Business Infrastructure

Computer Information Science Program Student Learning Outcomes From the 2005 PrOF (Program Review)
1 Communication Skills: share information effectively using state-of-the-art technology; receive and process written and oral information and prepare the appropriate response; ask effective questions; work effectively, individually, and as a member of a group.
2 Critical Thinking Skills: demonstrate the ability to think critically and analyze problems; find effective solutions to achieve desired objective using multiple sources; be comfortable with, and be able to deal with, ambiguous situations.
3 Ethics: respond ethically to given situations; make ethical decisions regarding privacy of data and use of both equipment and data; ethical use of data, information, hardware and software resources.
4 Technology Skill Sets: demonstrate knowledge of technology applicable to the field, and a proficiency in appropriate software; be competent evaluators and users of hardware; adapt to technological changes and select a current solution for a given problem.
5 Diversity: demonstrate the ability to relate and interact effectively in teams consisting of individuals with differing interests, genders, backgrounds and professions.
6 Information Competency: acquire and validate resources to solve technical problems; use information resources to gather discipline specific information or materials.

Computer Information Science Program Student Learning Outcomes From the 2005 PrOF (Program Review) CIS – Core, Applications and Web
PSLO 1 - Communication Skills: ▪ Share information effectively using state-of-the-art technology. ▪ Receive and process written and oral information and prepare the appropriate response. ▪ Ask effective questions. ▪ Work effectively, individually, and as a member of a group.
PSLO 2 - Critical Thinking Skills: ▪ Demonstrate the ability to think critically and analyze problems. ▪ Find effective solutions to achieve desired objective using multiple sources. ▪ Be comfortable with, and be able to deal with, ambiguous situations.

PSLO 3 - Ethics:

- Respond ethically to given situations.
- Make ethical decisions regarding privacy of data and use of both equipment and data.
- Ethical use of data, information, hardware and software resources.

PSLO 4 - Technology Skill Sets:

- Demonstrate knowledge of technology applicable to the field, and a proficiency in appropriate software.
- Be competent evaluators and users of hardware.
- Adapt to technological changes and select a current solution for a given problem.

PSLO 5 -Diversity:

- Demonstrate the ability to relate and interact effectively in teams consisting of individuals with differing interests, genders, backgrounds and professions.

PSLO 6 - Information Competency:

- Acquire and validate resources to solve technical problems.
- Use information resources to gather discipline specific information or materials.

Computer Information Science Program Student Learning Outcomes
From the 2005 PrOF (Program Review)
CIS – Database

PSLO 1 - Communication Skills:

- Share information effectively using state-of-the-art technology.
- Receive and process written and oral information and prepare the appropriate response.
- Ask effective questions.
- Work effectively, individually, and as a member of a group.

PSLO 2 - Critical Thinking Skills:

- Demonstrate the ability to think critically and analyze problems.
- Find effective solutions to achieve desired objective using multiple sources.
- Be comfortable with, and be able to deal with, ambiguous situations.

PSLO 3 - Ethics:

- Respond ethically to given situations.
- Make ethical decisions regarding privacy of data and use of both equipment and data.
- Ethical use of data, information, hardware and software resources.

PSLO 4 - Technology Skill Sets:

- Demonstrate knowledge of technology applicable to the field, and a proficiency in appropriate software.
- Be competent evaluators and users of hardware.
- Adapt to technological changes and select a current solution for a given problem.
- Understand how to deal with interoperability between Microsoft and non-Microsoft products and systems.
- Demonstrate the proficiency of reliability and availability of hardware and software components that allow for efficient utilization of underlying data models, hardware devices and computers.
- Find effective solutions to supporting resources to support effective table and query design from web sites and other research avenues.
- Find effective solutions to supporting stated business and user requirements.

PSLO 5 - Diversity:

- Demonstrate the ability to relate and interact effectively in teams consisting of individuals with differing interests, genders, backgrounds and professions.

PSLO 6 - Information Competency:

- Acquire and validate resources to solve technical problems.
- Use information resources to gather discipline specific information or materials.

PSLO 7 - Security Skill Sets:

- Demonstrate the ability to control access to resources; audit access to resources; and authentication.

PSLO 8 - System Architecture and Data Models8 System Architecture and Data Models

- Demonstrate the ability to extract information from large database user installations.
- Find effective solutions to support advanced query and table design – optimize table relationship to utilize database resources more efficiently.

Computer Information Science Program Student Learning Outcomes
From the 2005 PrOF (Program Review)
CIS – Networking

PSLO 1 - Communication Skills:

- Share information effectively using state-of-the-art technology.
- Receive and process written and oral information and prepare the appropriate response.
- Ask effective questions.
- Work effectively, individually, and as a member of a group.

PSLO 2 - Critical Thinking Skills:

- Demonstrate the ability to think critically and analyze problems.
- Find effective solutions to achieve desired objective using multiple sources.
- Be comfortable with, and be able to deal with, ambiguous situations.

PSLO 3 - Ethics:

- Respond ethically to given situations.
- Make ethical decisions regarding privacy of data and use of both equipment and data.
- Ethical use of data, information, hardware and software resources.

PSLO 4 - Technology Skill Sets:

- Demonstrate knowledge of technology applicable to the field, and a proficiency in appropriate software.
- Be competent evaluators and users of hardware.
- Adapt to technological changes and select a current solution for a given problem.
- Understand how to deal with interoperability between Microsoft and non-Microsoft products and systems.
- Demonstrate the proficiency of reliability and availability of hardware and software components that provide:; fault tolerance; load balancing; disaster recovery methods such as backup and restore.
- Hardware Devices and Drivers, which includes storage devices; I/O devices such as printers and scanners; server computers; and client computers.
- Find effective solutions to supporting resources, such as printers; files and folders; applications; web sites; and databases.
- Find effective solutions to supporting the network infrastructure, such as network topology; routing; IP addressing; name resolution such as WINS and DNS; virtual private networks; remote access; and telephony solutions.

PSLO 5 - Diversity:

- Demonstrate the ability to relate and interact effectively in teams consisting of individuals with differing interests, genders, backgrounds and professions.

PSLO 6 - Information Competency:

- Acquire and validate resources to solve technical problems.
- Use information resources to gather discipline specific information or materials.

PSLO 7 - Security Skill Sets:

- Demonstrate the ability to controlling access to resources; auditing access to resources; authentication; and encryption.

PSLO 8 - System Architecture and Models:

- Demonstrate the ability to support unified directory services such as Active Directory and Windows NT domains.
- Find effective solutions to support connectivity between and within systems, system components, and applications. Examples include Exchange Server connectors and SMS senders. Data replication such as directory replication and database replication.

Computer Information Science Program Student Learning Outcomes
From the 2005 PrOF (Program Review)
CIS – Programming

PSLO 1 - Communication Skills:

- Describe (using programming terms) logic development and programming implementation problems. The question will likely be asked in written form, through email or discussion boards. The source of the solution will often be knowledgeable staff (professors, I.A.s, other students).
- Document a program with written comments using both plain English and programming terms so that a knowledgeable reviewer can immediately understand the logic of the program.

PSLO 2 - Critical Thinking Skills:

- Understand and modify existing programs to meet new requirements. Recognize when the existing program cannot be modified and a new program must be created.
- Develop the logic of a program from problem specifications. The logic will contain steps necessary to move from user input to a correct output.
- Determine how to implement programming logic using the components of a particular programming language.

PSLO 3 - Ethics:

- A student should complete graded assignments on time and by themselves without including unattributed information from other sources.

PSLO 4 - Technology Skill Sets:

- Demonstrate knowledge of technology applicable to the field, and a proficiency in appropriate software.
- Be competent evaluators and users of hardware.
- Adapt to technological changes and select a current solution for a given problem.

PSLO 5 - Diversity:

- Demonstrate the ability to relate and interact effectively in teams consisting of individuals with differing interests, genders, backgrounds and professions.

PSLO 6 - Information Competency:

- Find existing solutions to logic development and programming implementation problems that are part of a larger program. The solution source will often be written documentation (help utilities, discussion groups, user groups).

PSLO 7 -Programming Skill Sets:

- Select the appropriate programming language with which to implement a given programming logic. The selection should be based on the strengths of the language, including:
    a. Type of user interface that can be created (GUI, simple text console window, web page)
    b. Ability to get data into program from the keyboard, a text file, or a database file
    c. Ability to save output to a text file or a database file if necessary
    d. Ability to execute cross-platform

e. Ability to execute on a server for web-based programs
f. Ease of development and maintenance of the program

- Existence of predefined data structures

Computer Information Science Program Student Learning Outcomes
From the 2005 PrOF (Program Review)
CIS – Security

PSLO 1 Communication Skills:

- Share information effectively using state-of-the-art technology.
- Receive and process written and oral information and prepare the appropriate response.
- Ask effective questions.
- Work effectively, individually, and as a member of a group.

PSLO 2 Critical Thinking Skills:

- Demonstrate the ability to think critically and analyze problems.
- Find effective solutions to achieve desired objective using multiple sources.
- Be comfortable with, and be able to deal with, ambiguous situations.

PSLO 3 Ethics:

- Respond ethically to given situations.
- Make ethical decisions regarding privacy of data and use of both equipment and data.
- Ethical use of data, information, hardware and software resources.
- Understand current laws as they apply to IT.

PSLO 4 Technology Skill Sets:

- Demonstrate knowledge of technology applicable to the field, and a proficiency in appropriate software.
- Be competent evaluators and users of hardware.
- Adapt to technological changes and select a current solution for a given problem.

PSLO 5 Information Competency:

- Acquire and validate resources to solve technical problems.
- Use information resources to gather discipline specific information or materials.

PSLO6 Security Skill Sets: Demonstrate knowledge of:

- Access control systems and methodology
- Applications and systems development security
- Business continuity planning (BCP) and disaster recovery planning (DRP)
- Cryptography
- Operations security
- Physical security
- Security architecture and models
- Security management practices
- Telecommunications and network security

A.S. - Computer Science Student Learning Outcomes*
SLO 1 Redefine a complex problem into a sequential set of parts that can be translated into the language of programming logic.
SLO 2 Design, write, test, and debug computer programs in a structured language, a low-level language, and an object-oriented language.
SLO 3 Incorporate foundational data management concepts such as data structures within computer programs.

A.S. - Information Systems Security Student Learning Outcomes*
SLO 1 Evaluate the different types of access control methods used to secure a network, in particular authentication, authorization and audit.
SLO 2 Construct a Business Continuity and a Disaster Recovery Plan. These plans are used by an organization to resume partially or completely interrupted critical function(s) within a predetermined time after a disaster or temporary disruption.
SLO 3 Analyze the different types of cryptography used in computer and network security in such area as access control and information confidentiality.
SLO 4 Recognize some of the methods used to properly conduct a computer forensics investigation. This discussion should begin with a discussion on ethics.
SLO 5 Evaluate a firewall to prevent unauthorized access to a network or computer. Students will also learn how to allow access to key services while maintaining an organization's security.
SLO 6 Evaluate, implement and manage secure remote-access technologies, such as Internet Detection Systems (IDS), which are powerful tools used for identifying and responding to network- and host-based intrusions.
SLO 7 Distinguish the different ways to secure an operating system. Students will know how to maintain the integrity, authenticity, availability, and privacy of data.
SLO 8 Analyze risks to a network and be able to implement a workable security policy that protects information assets from potential intrusion, damage or theft.

A.S. - Server Administrator Student Learning Outcomes*
SLO 1 Manage, implement, and maintain the typically complex computing environment of medium- to large-sized companies
SLO 2 Manage and maintain a Windows server environment
SLO 3 Manage, implement, and maintain a Windows server network infrastructure
SLO 4 Develop the critical verbal, written, and quantitative skills needed to analyze complex issues
SLO 5 Develop an understanding of the basic concepts and major modes of inquiry used in a variety of disciplines
SLO 6 Develop a depth of understanding, including critical cognitive, psychomotor and affective skills, in this discipline
SLO 7 Make progress toward becoming engaged and self-reliant learners demonstrating habits of intellectual inquiry and striving toward their maximum potential
SLO 8 Become more prepared to contribute to a diverse democratic society with a pluralistic perspective

A.S. - Enterprise Administrator Student Learning Outcomes*
SLO 1 Manage, implement, and maintain the typically complex computing environment of medium- to large-sized companies
SLO 2 Manage and maintain a Windows server environment
SLO 3 Manage, implement, and maintain a Windows server network infrastructure

SLO 4 Plan, design, and implement Microsoft Windows server solutions and architectures in medium- to large-sized companies
SLO 5 Develop the critical verbal, written, and quantitative skills needed to analyze complex issues
SLO 6 Develop an understanding of the basic concepts and major modes of inquiry used in a variety of disciplines
SLO 7 Develop a depth of understanding, including critical cognitive, psychomotor and affective skills, in this discipline
SLO 8 Make progress toward becoming engaged and self-reliant learners demonstrating habits of intellectual inquiry and striving toward their maximum potential
SLO 9 Become more prepared to contribute to a diverse democratic society with a pluralistic perspective

Certificate - Server Administrator Student Learning Outcomes*
SLO 1 Manage, implement, and maintain the typically complex computing environment of medium- to large-sized companies
SLO 2 Manage and maintain a Windows server environment
SLO 3 Manage, implement, and maintain a Windows server network infrastructure

Certificate - Enterprise Administrator Student Learning Outcomes*
SLO 1 Manage, implement, and maintain the typically complex computing environment of medium- to large-sized companies
SLO 2 Manage and maintain a Windows server environment
SLO 3 Manage, implement, and maintain a Windows server network infrastructure
SLO 4 Plan, design, and implement Microsoft Windows server solutions and architectures in medium- to large-sized companies

Certificate - Web Programming Student Learning Outcomes* To be finalized during 2009-2010 curriculum process (draft below)
SLO 1 Design, develop, support, and maintain professional Web pages.
SLO 2 Demonstrate knowledge of web-related technology and media applications.
SLO 3 Be competent evaluators and users of the World Wide Web.
SLO 4 Adapt to technological changes and select a current solution for a given problem.
SLO 5 Understand how to deal with interoperability between different products, systems, and platforms.
SLO 6 Find effective solutions to maintaining and supporting web sites and related resources.

Certificate - Information Systems Security Student Learning Outcomes*
SLO 1 Evaluate the different types of access control methods in particular authentication, authorization and audit.
SLO 2 Configure a firewall to prevent unauthorized access to a network or computer. Students will also learn how to allow access to key services while maintaining an organization's security.
SLO 3 Evaluate, implement and manage secure remote-access technologies, such as Internet Detection Systems (IDS), which are powerful tools used for identifying and responding to network- and host-based intrusions.
SLO 4 Critique the different ways to secure an operating system. Students will learn how to maintain the integrity, authenticity, availability, and privacy of data.
SLO 5 Analyze risks to a network and be able to implement a workable security policy that protects information assets from potential intrusion, damage or theft.

Certificate – Software Development Using Visual BASIC.NET Student Learning Outcomes*
SLO 1 Design and develop desktop applications for a desktop Windows computer. These applications may contain more than a single window, accept input data from the keyboard or a file, send output to the monitor or a file, and handle user input errors. The data storage format may be binary, text, or XML.
SLO 2 Design and develop web applications that reside on a Windows server computer. The web application responds to page requests from a client computer, accepts input from a client computer or a file or another server, sends output to a client computer or a file or another server, and handles run-time errors. Incorporate web concepts such as postback, cache, cookies, sessions, and tags with the application.
SLO 3 Design and develop applications that execute on either a Windows desktop machine or a Windows server and use a database as an input data source and/or an output data source. Incorporate SQL data searches of related tables within the application.
SLO 4 Create new Graphical User Interface or data storage classes using inheritance to extend or limit existing .NET Framework classes.

Certificate – Web Publishing Student Learning Outcomes*
SLO 1 Demonstrate knowledge of web-related technology and media applications.
SLO 2 Be competent evaluators and users of the World Wide Web.
SLO 3 Adapt to technological changes and select a current solution for a given problem
SLO 4 Understand how to deal with interoperability between different products, systems, and platforms.
SLO 5 Find effective solutions to maintaining and supporting web sites and related resources.

Certificate – Linux System Administrator Student Learning Outcomes*
SLO 1 Understand the concepts behind free software, run levels, daemons, the kernel, basic networking and devices.
SLO 2 Install the operating system and configure aspects of it (hard drive, X Window, etc.). Know how the startup and shutdown function works, as well as the basics of disk layout, user accounts, and common processes.
SLO 3 Comprehend the file system structure and nature of inodes. Know how to create a rescue media, monitor resources, and apply patches.
SLO 4 Demonstrate the layout of a Local Area Network and how to configure it with TCP/IP. List different protocols and services and how they are tested, including how they are configured in a host, a network, or an adapter.
SLO 5 Implement basic security methods, such as shadow passwords, log events, and be able to look for commonly known trouble spots.

* Developed through the Curriculum Committee approval process.