COMPUTER INFORMATION SYSTEMS

pcc.edu/programs/computer-info/

CAREER AND PROGRAM DESCRIPTION

Computer Information Systems are the lifeblood of the 21st century. The mainstream languages, tools, technologies and techniques used in training will allow students to pursue careers in either the computer networking or information software fields. On the networking side, computer configuration, network installation, network systems administration, security, forensics and wireless networking are some career choices. On the software side, student career choices include all phases of application development, database programming, software quality assurance, and project management on both desktop and World Wide Web platforms.

Computer Information Systems AAS Degree: This degree prepares students for computer information systems related careers. Students will take classes in the CIS Department that include software analysis, design, programming (in two or more languages), database modeling, Windows or Unix operating systems, data communications and an extensive selection of electives. Emphasis is on developing enduring skills and knowledge, rather than on training students to use specific tools and applications that may be "fashionable," but that haven't established a foothold in industry.

Computer Information Systems: Network Administration AAS Degree: This degree prepares students for computer networking related careers. Students will take classes in the CIS Department including data communications, Windows and Linux network administration, network security and an extensive selection of electives. Students earning this degree will be well on their way to several network administration certifications from Microsoft and Comp TIA.

Computer Information Systems: Cybersecurity AAS Degree: This degree prepares students for a variety of cybersecurity-focused careers in the field of computer information systems. Students will take classes in the CIS Department that include cybersecurity concepts, networking, server administration, programming, database modeling, and web development. Emphasis is on applying cybersecurity concepts in a variety of business computing environments. Students earning this degree will be prepared to meet the growing nationwide shortage of cybersecurity professionals.

Computer Information Systems: Web Development and Design AAS Degree: This degree prepares students for a variety of web development and design careers. This cross-discipline degree includes classes on web development programming (HTML, CSS, Java, JavaScript), mobile app development, Windows or Unix operating systems, database modeling and secure coding as well as classes in UX/UI design concepts, generative art and data visualization. Emphasis is on applying web development and design concepts to build successful solutions to business challenges. Students earning this degree will be prepared to meet the growing nationwide need for web development and design professionals.

Computer Information Systems One-Year Certificate: This certificate provides students with a foundation in computer information systems concepts. Students seeking this certificate often have various primary roles in their organizations and are taking on additional responsibilities involving information systems.

DEGREES AND CERTIFICATES OFFERED

ASSOCIATE OF APPLIED SCIENCE DEGREE

Computer Information Systems
Computer Information Systems: Network Administration Option
Cybersecurity
Web Development and Design

ONE-YEAR CERTIFICATE

Computer Information Systems

LESS THAN ONE-YEAR CERTIFICATE

Advanced Windows Network Security
C# Application Programming
Cybersecurity Foundations
Database Design and SQL
Java Application Programming
Network Administration: Linux Server
Network Administration: Microsoft Server
Network Security - Linux
Network Security - Windows
Secure Programming
Web Application Development

Academic Prerequisites

- Cybersecurity AAS is a limited entry degree.
- The Less Than One-Year Certificates are limited entry certificates.

Academic Requirements

- Computer Information Systems AAS: Students must satisfactorily complete all courses with a CIS and CS prefix in the degree with a grade of "C" or "P" or better.
- Computer Information Systems: Network Administration AAS Degree: Students must satisfactorily complete all courses with a CIS and CS prefix in the degree with a grade of "C" or "P" or better.
- Computer Information Systems: Cybersecurity AAS Degree: Students must satisfactorily complete all courses with a CIS, CS and CJA prefix in the degree with a grade of "C" or "P" or better.
- Computer Information Systems: Web Development and Design AAS Degree: Students must satisfactorily complete all courses with a CIS, CS, MM, and MUC prefix in the degree with a grade of "C" or "P" or better.
- Computer Information Systems One-Year Certificate: All required courses in this program apply toward the credits needed to obtain an AAS degree in Computer Information Systems or CIS Network Administration. Students must satisfactorily complete all courses with a CIS and CS prefix with a grade of "C" or "P" or better.
- The Less Than One-Year Certificates: These certificates begin at an advanced level and are designed for individuals already working in, or have worked in, an information technology position.
  - Students must satisfactorily complete all courses with a CIS and CS prefix with a grade of "C" or "P" or better.
  - Students must contact a CIS advisor for correct placement in any of these certificate programs.
- Reading, writing and math readiness is critical for all Computer Information System (CIS) degrees and certificates. Talk to a CIS Department advisor for clarification regarding what constitutes math competency. Students with insufficient preparation to enter at this level may need to extend the time it takes to complete the program. CIS Department advisors will provide information regarding options to those students who may need to take preparatory course work.

Non-Academic Prerequisites

- None

Non-Academic Requirements

- None

ASSOCIATE OF APPLIED SCIENCE DEGREE

COMPUTER INFORMATION SYSTEMS AAS DEGREE

Minimum 92 credits. Students must also meet Associate Degree Comprehensive Requirements and Associate of Applied Science Requirements. Students must complete a total of four courses of General Education. Some courses specified within the program may be used as General Education. In addition to required courses in the program of study, students must satisfy MTH 58/65 competency. Students should consult with program advisors for course planning.

Computer Information Systems Degree Courses

Code	Title	Credits
CIS 121	Information Systems and Programming [*]	4
CIS 122	Introduction to Programming Logic [*]	4
CIS 140M	Operating Systems I: Microsoft	4
or CIS 140L	Introduction to Linux/UNIX	
CIS 179	Data Communication Concepts I	4
CIS 184C	Introduction to Information Security	4
CIS 234A	Real-World Programming	4
or CIS 280D	Cooperative Education: Application Development	
CIS 244	Systems Analysis	4
CIS 275	Data Modeling and SQL Introduction	4
WR 121	Composition I (WR121=WR121Z) [Z]	4
WR 122	Composition II (WR122=WR122Z) [Z]	4
or WR 227	Technical Writing (WR227=WR227Z)	
CIS Program Electives [1]		32
CIS Programming Electives [2]		8
CIS Program Business Electives		6
General Education: 2 courses		
Total Credits		92

[*]
Could be used as General Education

[1]
CIS Program Electives - 32 credits total from Introductory Electives or Advanced Electives. A minimum of 16 credits from Advanced Electives.

[2]
For the Computer Information Systems AAS Degree, eight credits of programming electives must be a two-term sequence from the Programming Elective List.

[Z]
This course is part of Oregon Common Course Numbering. The following courses are equivalent:
WR 121 and WR 121Z
WR 122 and WR 122Z
WR 227 and WR 227Z

COMPUTER INFORMATION SYSTEMS PROGRAM ELECTIVES

Code	Title	Credits
Introductory Courses		
CIS 120	Digital Literacy	4
CIS 125D	Database Application Development I	4
CIS 133J	Java Programming I	4
CIS 133N	Introduction to Programming Using C#.NET	4
CIS 133W	JavaScript for Web Developers	4
CIS 133Y	Python Programming I	4
CIS 135M	Mobile Application Programming for Android	4
CIS 140L	Introduction to Linux/UNIX	4
CIS 140M	Operating Systems I: Microsoft	4
CIS 145	Microcomputer Hardware and Troubleshooting	4
CIS 182	Introduction to Cloud Computing	4
CIS 188	Introduction to Wireless Networking	4
CIS 189	Wireless Security	4
CIS 195H	HTML and CSS	4
CIS 195N	JavaScript Programming Using Node.js I	4
CIS 195P	PHP Web Development I	4
CS 133U	C Programming	4
CS 160	Exploring Computer Science [*]	4
CS 161	Computer Science I [*]	4
CS 161A	Programming and Problem Solving I	4
CS 161B	Programming and Problem Solving II	4
EET 178	Computing Environments for Technicians	4
Advanced Courses		
CIS 225	End User Support	4
CIS 233J	Java Programming II	4
CIS 233N	Intermediate C#.NET Programming	4
CIS 233W	JavaScript for Web Developers II	4
CIS 233Y	Python Programming II	4
CIS 234A	Real-World Programming	4
CIS 234R	Secure Coding	4
CIS 240L	Linux Installation and Configuration	4
CIS 240M	Managing a Windows Server Environment	4
CIS 244	Systems Analysis	4
CIS 245	Project Management - Information Systems	4
CIS 275	Data Modeling and SQL Introduction	4
CIS 276	Advanced SQL	4
CIS 277A	Data Analytics	4
CIS 277O	Advanced Database Concepts in Oracle	4
CIS 277S	Introduction to Data Science	4
CIS 277T	Web Business Intelligence Application Development	4
CIS 278	Data Communication Concepts II	4
CIS 278A	Cisco 1: Introduction to Networks	4
CIS 279L	Linux Network Administration	4
CIS 280D	Cooperative Education: Application Development [1]	4
CIS 284C	Cybersecurity Concepts	4
CIS 285E	Ethical Hacking	4
CIS 286	Computer Forensics	4
CIS 287M	Microsoft Server Security	4
CIS 288M	Microsoft Network Administration	4
CIS 289M	Microsoft Active Directory Administration	4
CIS 295N	JavaScript Programming Using Node.js II	4
CIS 295P	PHP Web Development II	4
CS 162	Computer Science II [*]	4
CS 201	Computer Systems	4

CS 260	Data Structures	4
CS 261	Programming Systems	4

*
Could be used as General Education

1
A maximum of four CIS 280D credits can be applied toward the CIS degree. Additional credits, up to a maximum of eight, may be applied toward the degree, but must be approved by a CIS Department chair.

COMPUTER INFORMATION SYSTEMS PROGRAMMING ELECTIVES

Code	Title	Credits
CIS 133J & CIS 233J	Java Programming I and Java Programming II	8
CIS 133N & CIS 233N	Introduction to Programming Using C#.NET and Intermediate C#.NET Programming	8
CIS 133W & CIS 233W	JavaScript for Web Developers and JavaScript for Web Developers II	8
CIS 133Y & CIS 233Y	Python Programming I and Python Programming II	8
CS 161B & CS 162	Programming and Problem Solving II and Computer Science II	8

COMPUTER INFORMATION SYSTEMS PROGRAM BUSINESS ELECTIVES

Code	Title	Credits
BA 111	Introduction to Accounting	3
BA 205	Business Communication Using Technology	4
BA 206	Management Fundamentals	3
BA 211	Principles of Financial Accounting	4
BA 212	Principles of Accounting II	3
BA 213	Managerial Accounting	4
BA 216A	Data Analytics with Excel and Tableau	4
BA 223	Principles of Marketing	4
BA 226	Business Law I	4
EC 201	Principles of Economics: Microeconomics *	4
EC 202	Principles of Economics: Macroeconomics *	4

*
Could be used as General Education

NETWORK ADMINISTRATION AAS DEGREE

Minimum 92 credits. Students must also meet Associate Degree Comprehensive Requirements and Associate of Applied Science Requirements. Students must complete a total of four courses of General Education. Some courses specified within the program may be used as General Education. In addition to required courses in the program of study, students must satisfy MTH 58/65 competency. Students should consult with program advisors for course planning.

Network Administration Degree Courses

Code	Title	Credits
CIS 121	Information Systems and Programming *	4
CIS 122	Introduction to Programming Logic *	4
CIS 140L	Introduction to Linux/UNIX	4
CIS 140M	Operating Systems I: Microsoft	4
CIS 145	Microcomputer Hardware and Troubleshooting	4
CIS 179	Data Communication Concepts I	4
CIS 182	Introduction to Cloud Computing	4
CIS 184C	Introduction to Information Security	4
CIS 240M	Managing a Windows Server Environment	4
or CIS 240L	Linux Installation and Configuration	
CIS 288M	Microsoft Network Administration	4
or CIS 279L	Linux Network Administration	
WR 121	Composition I (WR121=WR121Z) ^{Z}	4
WR 122	Composition II (WR122=WR122Z) ^{Z}	4
or WR 227	Technical Writing (WR227=WR227Z)	
CIS Network Administration Degree Electives [1]		28
CIS Program Business Electives		6
CIS First Term Programming Elective		4
General Education: 2 courses		
Total Credits		92

*
Could be used as General Education.

1
Network Administration Electives - 28 credit total, 16 credits must be at the 200 level.

Z
This course is part of Oregon Common Course Numbering. The following courses are equivalent:
WR 121 and WR 121Z
WR 122 and WR122Z
WR 227 and WR227Z

COMPUTER INFORMATION SYSTEMS NETWORK ADMINISTRATION DEGREE ELECTIVES

Code	Title	Credits
CIS 120	Digital Literacy	4
CIS 188	Introduction to Wireless Networking	4
CIS 189	Wireless Security	4
CIS 225	End User Support	4
CIS 240L	Linux Installation and Configuration	4
CIS 240M	Managing a Windows Server Environment	4
CIS 244	Systems Analysis	4
CIS 245	Project Management - Information Systems	4
CIS 275	Data Modeling and SQL Introduction	4
CIS 278	Data Communication Concepts II	4
CIS 278A	Cisco 1: Introduction to Networks	4
CIS 278B	Cisco 2: Switching, Routing, and Wireless Essentials	4
CIS 278C	Cisco 3: Enterprise Networking, Security, and Automation	4
CIS 279L	Linux Network Administration	4
CIS 280D	Cooperative Education: Application Development	1-4
CIS 284C	Cybersecurity Concepts	4
CIS 285E	Ethical Hacking	4
CIS 286	Computer Forensics	4
CIS 287M	Microsoft Server Security	4

CIS 288M	Microsoft Network Administration	4
CIS 289M	Microsoft Active Directory Administration	4

COMPUTER INFORMATION SYSTEMS PROGRAM BUSINESS ELECTIVES

Code	Title	Credits
BA 111	Introduction to Accounting	3
BA 205	Business Communication Using Technology	4
BA 206	Management Fundamentals	3
BA 211	Principles of Financial Accounting	4
BA 212	Principles of Accounting II	3
BA 213	Managerial Accounting	4
BA 216A	Data Analytics with Excel and Tableau	4
BA 223	Principles of Marketing	4
BA 226	Business Law I	4
EC 201	Principles of Economics: Microeconomics	4
EC 202	Principles of Economics: Macroeconomics [*]	4

*
Could be used as General Education

COMPUTER INFORMATION SYSTEMS PROGRAMMING ELECTIVES

Code	Title	Credits
CIS 133J & CIS 233J	Java Programming I and Java Programming II	8
CIS 133N & CIS 233N	Introduction to Programming Using C#.NET and Intermediate C#.NET Programming	8
CIS 133W & CIS 233W	JavaScript for Web Developers and JavaScript for Web Developers II	8
CIS 133Y & CIS 233Y	Python Programming I and Python Programming II	8
CS 161B & CS 162	Programming and Problem Solving II and Computer Science II	8

CYBERSECURITY AAS DEGREE

Minimum 91 credits. Students must also meet Associate Degree Comprehensive Requirements and Associate of Applied Science Requirements. Students must complete a total of four courses of General Education. Some courses specified within the program may be used as General Education. In addition to required courses in the program of study, students must satisfy MTH 58/65 competency. Students should consult with program advisors for course planning.

Cybersecurity Degree Courses

Code	Title	Credits
CIS 121	Information Systems and Programming [*]	4
CIS 122	Introduction to Programming Logic [*]	4
CIS 140L	Introduction to Linux/UNIX	4
CIS 140M	Operating Systems I: Microsoft	4
CIS 179	Data Communication Concepts I	4
CIS 184C	Introduction to Information Security	4
CIS 240L	Linux Installation and Configuration	4
CIS 240M	Managing a Windows Server Environment	4
CIS 284C	Cybersecurity Concepts	4
WR 121	Composition I (WR121=WR121Z) [Z]	4
WR 227	Technical Writing (WR227=WR227Z) [Z]	4

CIS First Term Programming Elective		4
CIS Cybersecurity Degree Electives [1]		23
CIS Cybersecurity Advanced Electives		8
CIS Cybersecurity Business Electives		6
General Education: 2 courses		
Total Credits		91

*
Could be used as General Education.

[1]
Cybersecurity Electives - at least 8 credits must be at the 200 level.

[Z]
This course is part of Oregon Common Course Numbering. The following courses are equivalent:
WR 121 and WR 121Z
WR 227 and WR227Z

CIS FIRST TERM PROGRAMMING ELECTIVE

Code	Title	Credits
CIS 133J	Java Programming I	4
CIS 133N	Introduction to Programming Using C#.NET	4
CIS 133W	JavaScript for Web Developers	4
CIS 133Y	Python Programming I	4
CIS 195P	PHP Web Development I	4
CS 161B	Programming and Problem Solving II	4

CYBERSECURITY DEGREE ELECTIVES

Code	Title	Credits
CIS 120	Digital Literacy	4
CIS 135M	Mobile Application Programming for Android	4
CIS 145	Microcomputer Hardware and Troubleshooting	4
CIS 182	Introduction to Cloud Computing	4
CIS 188	Introduction to Wireless Networking	4
CIS 189	Wireless Security	4
CIS 225	End User Support	4
CIS 233J	Java Programming II	4
CIS 233N	Intermediate C#.NET Programming	4
CIS 233W	JavaScript for Web Developers II	4
CIS 233Y	Python Programming II	4
CIS 234A	Real-World Programming	4
CIS 234R	Secure Coding	4
CIS 244	Systems Analysis	4
CIS 275	Data Modeling and SQL Introduction	4
CIS 276	Advanced SQL	4
CIS 278	Data Communication Concepts II	4
CIS 278A	Cisco 1: Introduction to Networks	4
CIS 279L	Linux Network Administration	4
CIS 280D	Cooperative Education: Application Development	1-4
CIS 285E	Ethical Hacking	4
CIS 286	Computer Forensics	4
CIS 287M	Microsoft Server Security	4
CIS 288M	Microsoft Network Administration	4
CIS 289M	Microsoft Active Directory Administration	4
CIS 295P	PHP Web Development II	4

CJA 117	Introduction to Homeland Security	3
CS 162	Computer Science II	4

CYBERSECURITY ADVANCED ELECTIVES

Code	Title	Credits
CIS 234R	Secure Coding	4
CIS 285E	Ethical Hacking	4
CIS 286	Computer Forensics	4
CIS 287M	Microsoft Server Security	4

CYBERSECURITY BUSINESS ELECTIVES

Code	Title	Credits
BA 111	Introduction to Accounting	3
BA 205	Business Communication Using Technology	4
BA 206	Management Fundamentals	3
BA 211	Principles of Financial Accounting	4
BA 213	Managerial Accounting	4
BA 216A	Data Analytics with Excel and Tableau	4
BA 226	Business Law I	4

WEB DEVELOPMENT AND DESIGN AAS DEGREE

Minimum 92 credits. Students must also meet Associate Degree Comprehensive Requirements and Associate of Applied Science Requirements. Students must complete a total of four courses of General Education. Some courses specified within the program may be used as General Education. In addition to required courses in the program of study, students must satisfy MTH 58/65 competency. Students should consult with program advisors for course planning.

Web Development and Design Degree Courses

Code	Title	Credits
CIS 121	Information Systems and Programming [*]	4
CIS 122	Introduction to Programming Logic [*]	4
CIS 125D	Database Application Development I	4
CIS 133W	JavaScript for Web Developers	4
CIS 140M	Operating Systems I: Microsoft	4
or CIS 140L	Introduction to Linux/UNIX	
CIS 184C	Introduction to Information Security	4
CIS 195H	HTML and CSS	4
CIS 195N	JavaScript Programming Using Node.js I	4
CIS 195P	PHP Web Development I	4
CIS 233W	JavaScript for Web Developers II	4
CIS 234A	Real-World Programming	4
or CIS 280D	Cooperative Education: Application Development	
CIS 234R	Secure Coding	4
CIS 275	Data Modeling and SQL Introduction	4
CIS 277A	Data Analytics	4
MM 120	Multimedia Design	2
MUC 218	Digital Arts & Equity	4
MUC 261	Data Visualization & Sonification	4
MUC 262	Interface Design	4
WR 121	Composition I (WR121=WR121Z) [Z]	4
WR 122	Composition II (WR122=WR122Z) [Z]	4
or WR 227	Technical Writing (WR227=WR227Z)	
Web Development and Design 2nd Year Electives: 2 courses		8
General Education: 2 courses		
Total Credits		92

[*]
Could be used as General Education

[Z]
This course is part of Oregon Common Course Numbering. The following courses are equivalent:
WR 121 and WR 121Z
WR 122 and WR 122Z
WR 227 and WR 227Z

WEB DEVELOPMENT AND DESIGN 2ND YEAR ELECTIVES

Code	Title	Credits
BA 216A	Data Analytics with Excel and Tableau	4
CIS 133J	Java Programming I	4
CIS 133N	Introduction to Programming Using C#.NET	4
CIS 133Y	Python Programming I	4
CIS 181	CMS Web Development	4
CIS 182	Introduction to Cloud Computing	4
CIS 233J	Java Programming II	4
CIS 233N	Intermediate C#.NET Programming	4
CIS 233Y	Python Programming II	4
CIS 277S	Introduction to Data Science	4
CIS 295N	JavaScript Programming Using Node.js II	4
MUC 206	Body Interface Design	4
MUC 278	Generative Art on the Web	4

ONE-YEAR CERTIFICATE

LESS THAN ONE-YEAR CERTIFICATE

Advanced Windows Network Security

COMPUTER INFORMATION SYSTEMS ONE-YEAR CERTIFICATE

Minimum 47 credits. Students must meet all certificate requirements.

Computer Information Systems Certificate Courses

Code	Title	Credits
CIS 121	Information Systems and Programming [§]	4
CIS 122	Introduction to Programming Logic [§]	4
CIS 140M	Operating Systems I: Microsoft	4
or CIS 140L	Introduction to Linux/UNIX	
CIS 179	Data Communication Concepts I	4
CIS 184C	Introduction to Information Security	4
WR 121	Composition I (WR121=WR121Z) [Z]	4
WR 122	Composition II (WR122=WR122Z) [§,Z]	4
or WR 227	Technical Writing (WR227=WR227Z)	
CIS Program Electives (see list below)		12
CIS Program Business Electives (see list below)		3

Related Instruction Human Relations Elective (see list below) §		4
Total Credits		47

§
Course contains Related Instruction and cannot be substituted with another course; Related Instruction details can be viewed here.

Z
This course is part of Oregon Common Course Numbering. The following courses are equivalent:
WR 121 and WR 121Z
WR 122 and WR 122Z
WR 227 and WR 227Z

COMPUTER INFORMATION SYSTEMS PROGRAM ELECTIVES

Code	Title	Credits
Introductory Courses		
CIS 120	Digital Literacy	4
CIS 125D	Database Application Development I	4
CIS 133J	Java Programming I	4
CIS 133N	Introduction to Programming Using C#.NET	4
CIS 133W	JavaScript for Web Developers	4
CIS 133Y	Python Programming I	4
CIS 135M	Mobile Application Programming for Android	4
CIS 140L	Introduction to Linux/UNIX	4
CIS 140M	Operating Systems I: Microsoft	4
CIS 145	Microcomputer Hardware and Troubleshooting	4
CIS 182	Introduction to Cloud Computing	4
CIS 188	Introduction to Wireless Networking	4
CIS 189	Wireless Security	4
CIS 195H	HTML and CSS	4
CIS 195N	JavaScript Programming Using Node.js I	4
CIS 195P	PHP Web Development I	4
CS 133U	C Programming	4
CS 160	Exploring Computer Science [*]	4
CS 161	Computer Science I [*]	4
CS 161A	Programming and Problem Solving I	4
CS 161B	Programming and Problem Solving II	4
EET 178	Computing Environments for Technicians	4
Advanced Courses		
CIS 225	End User Support	4
CIS 233J	Java Programming II	4
CIS 233N	Intermediate C#.NET Programming	4
CIS 233W	JavaScript for Web Developers II	4
CIS 233Y	Python Programming II	4
CIS 234A	Real-World Programming	4
CIS 234R	Secure Coding	4
CIS 240L	Linux Installation and Configuration	4
CIS 240M	Managing a Windows Server Environment	4
CIS 244	Systems Analysis	4
CIS 245	Project Management - Information Systems	4
CIS 275	Data Modeling and SQL Introduction	4
CIS 276	Advanced SQL	4
CIS 277A	Data Analytics	4
CIS 277O	Advanced Database Concepts in Oracle	4
CIS 277S	Introduction to Data Science	4
CIS 277T	Web Business Intelligence Application Development	4
CIS 278	Data Communication Concepts II	4
CIS 278A	Cisco 1: Introduction to Networks	4
CIS 279L	Linux Network Administration	4
CIS 280D	Cooperative Education: Application Development [1]	4
CIS 284C	Cybersecurity Concepts	4
CIS 285E	Ethical Hacking	4
CIS 286	Computer Forensics	4
CIS 287M	Microsoft Server Security	4
CIS 288M	Microsoft Network Administration	4
CIS 289M	Microsoft Active Directory Administration	4
CIS 295N	JavaScript Programming Using Node.js II	4
CIS 295P	PHP Web Development II	4
CS 162	Computer Science II [*]	4
CS 201	Computer Systems	4
CS 260	Data Structures	4
CS 261	Programming Systems	4

*
Could be used as General Education

1
A maximum of four CIS 280D credits can be applied toward the CIS degree. Additional credits, up to a maximum of eight, may be applied toward the degree, but must be approved by a CIS Department chair.

COMPUTER INFORMATION SYSTEMS PROGRAM BUSINESS ELECTIVES

Code	Title	Credits
BA 111	Introduction to Accounting	3
BA 205	Business Communication Using Technology	4
BA 206	Management Fundamentals	3
BA 211	Principles of Financial Accounting	4
BA 212	Principles of Accounting II	3
BA 213	Managerial Accounting	4
BA 216A	Data Analytics with Excel and Tableau	4
BA 223	Principles of Marketing	4
BA 226	Business Law I	4
EC 201	Principles of Economics: Microeconomics [*]	4
EC 202	Principles of Economics: Macroeconomics [*]	4

*
Could be used as General Education

COMPUTER INFORMATION SYSTEMS RELATED INSTRUCTION HUMAN RELATIONS ELECTIVES

Code	Title	Credits
CG 191	Exploring Identity and Diversity for College Success	4
PSY 101	Psychology and Human Relations	4
PSY 201A	Introduction to Psychology - Part 1	4
PSY 202A	Introduction to Psychology - Part 2	4
PSY 214	Introduction to Personality	4
PSY 215	Human Development	4

PSY 216	Social Psychology	4
PSY 222	Family & Intimate Relationships	4
PSY 231	Foundations of Human Sexuality	4
PSY 232	Human Sexuality in Social Context	4
PSY 236	Psychology of Adult Development and Aging	4
PSY 239	Introduction to Abnormal Psychology	4
PSY 240	Personal Awareness and Growth	4
SOC 204	Introduction to Sociology	4
SOC 205	Social Change	4
SOC 206	Social Problems	4
SOC 213	Diversity in the United States	4
SOC 218	Sociology of Gender	4
SOC 232	Death and Dying: Culture and Issues	4
WS 101	Women's Studies	4

C# APPLICATION PROGRAMMING LESS THAN ONE-YEAR CERTIFICATE

Minimum 16 credits. Students must meet all certificate requirements.

C# Application Programming Certificate Courses

Code	Title	Credits
CIS 122	Introduction to Programming Logic	4
CIS 133N	Introduction to Programming Using C#.NET	4
CIS 233N	Intermediate C#.NET Programming	4
CIS 234A	Real-World Programming	4
Total Credits		16

ADVANCED WINDOWS NETWORK SECURITY LESS THAN ONE-YEAR CERTIFICATE

Minimum 28 credits. Students must meet all certificate requirements.

Advanced Windows Network Security Certificate Courses

Code	Title	Credits
CIS 189	Wireless Security	4
CIS 240M	Managing a Windows Server Environment	4
CIS 278	Data Communication Concepts II	4
CIS 284C	Cybersecurity Concepts	4
CIS 287M	Microsoft Server Security	4
CIS 288M	Microsoft Network Administration	4
CIS 289M	Microsoft Active Directory Administration	4
Total Credits		28

CYBERSECURITY FOUNDATIONS LESS THAN ONE-YEAR CERTIFICATE

Minimum 28 credits. Students must meet all certificate requirements.

Cybersecurity Foundations Certificate Courses

Code	Title	Credits
CIS 121	Information Systems and Programming	4
CIS 122	Introduction to Programming Logic	4
CIS 140L	Introduction to Linux/UNIX	4
CIS 140M	Operating Systems I: Microsoft	4
CIS 179	Data Communication Concepts I	4
CIS 184C	Introduction to Information Security	4

CIS 284C	Cybersecurity Concepts	4
Total Credits		28

DATABASE DESIGN AND SQL LESS THAN ONE-YEAR CERTIFICATE

Minimum 12 credits. Students must meet all certificate requirements.

Database Design and SQL Certificate Courses

Code	Title	Credits
CIS 125D	Database Application Development I	4
CIS 275	Data Modeling and SQL Introduction	4
CIS 276	Advanced SQL	4
Total Credits		12

JAVA APPLICATION PROGRAMMING LESS THAN ONE-YEAR CERTIFICATE

Minimum 16 credits. Students must meet all certificate requirements.

Java Application Programming Certificate Courses

Code	Title	Credits
CIS 122	Introduction to Programming Logic	4
or CIS 135M	Mobile Application Programming for Android	
CIS 133J	Java Programming I	4
CIS 233J	Java Programming II	4
CIS 234A	Real-World Programming	4
Total Credits		16

NETWORK ADMINISTRATION: LINUX SERVER LESS THAN ONE-YEAR CERTIFICATE

Minimum 16 credits. Students must meet all certificate requirements.

Linux Server Certificate Courses

Code	Title	Credits
CIS 179	Data Communication Concepts I	4
CIS 240L	Linux Installation and Configuration	4
CIS 279L	Linux Network Administration	4
CS 140U	Introduction to UNIX	4
Total Credits		16

NETWORK ADMINISTRATION: MICROSOFT SERVER ADMINISTRATION LESS THAN ONE-YEAR CERTIFICATE

Minimum 24 credits. Students must meet all certificate requirements.

Microsoft Server Certificate Courses

Code	Title	Credits
CIS 140M	Operating Systems I: Microsoft	4
CIS 179	Data Communication Concepts I	4
CIS 240M	Managing a Windows Server Environment	4
CIS 287M	Microsoft Server Security	4
CIS 288M	Microsoft Network Administration	4
CIS 289M	Microsoft Active Directory Administration	4
Total Credits		24

NETWORK SECURITY - LINUX LESS THAN ONE-YEAR CERTIFICATE

Minimum 20 credits. Students must meet all certificate requirements.

Network Security - Linux Certificate Courses

Code	Title	Credits
CIS 189	Wireless Security	4
CIS 240L	Linux Installation and Configuration	4
CIS 278	Data Communication Concepts II	4
CIS 279L	Linux Network Administration	4
CIS 284C	Cybersecurity Concepts	4
Total Credits		20

NETWORK SECURITY - WINDOWS LESS THAN ONE-YEAR CERTIFICATE

Minimum 16 credits. Students must meet all certificate requirements.

Network Security - Windows Certificate Courses

Code	Title	Credits
CIS 189	Wireless Security	4
CIS 240M	Managing a Windows Server Environment	4
CIS 278	Data Communication Concepts II	4
CIS 284C	Cybersecurity Concepts	4
Total Credits		16

SECURE PROGRAMMING LESS THAN ONE-YEAR CERTIFICATE

Minimum 24 credits. Students must meet all certificate requirements.

Secure Programming Certificate Courses

Code	Title	Credits
CIS 184C	Introduction to Information Security	4
CIS 234R	Secure Coding	4
CIS 275	Data Modeling and SQL Introduction	4
CS 140U	Introduction to UNIX	4
CIS Programming Electives [1]		8
Total Credits		24

[1]

Eight credits of programming electives must be a two-term sequence from the Programming Elective List.

WEB APPLICATION DEVELOPMENT LESS THAN ONE-YEAR CERTIFICATE

Minimum 12 credits. Students must meet all certificate requirements.

Web Application Development Certificate Courses

Code	Title	Credits
CIS 133W	JavaScript for Web Developers	4
CIS 135M	Mobile Application Programming for Android	4
CIS 195P	PHP Web Development I	4
Total Credits		12