# 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
Cisco Networking
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 (p. 2)

(p. 3)	on Systems: Network Administration Option		CIS 135M	Mobile Application Programming for Android	4
Cybersecurity (p. 4	,		CIS 140L	Introduction to Linux/UNIX	4
Web Development	and Design (p. 5)		CIS 140M	Operating Systems I: Microsoft	4
COMPUTER II	NFORMATION SYSTEMS AAS		CIS 145	Microcomputer Hardware and Troubleshooting	4
	s. Students must also meet Associate Degree	۵	CIS 181	CMS Web Development	4
	quirements and Associate of Applied Science		CIS 182	Introduction to Cloud Computing	4
	dents must complete a total of four courses of		CIS 188	Introduction to Wireless Networking	4
	Some courses specified within the program		CIS 189	Wireless Security	4
	Education. In addition to required courses		CIS 195H	HTML and CSS	4
	dy, students must satisfy MTH 58/65 compet		CIS 195N	JavaScript Programming Using Node.js I	4
Students should co	nsult with program advisors for course planr	iirig.	CIS 195P	PHP Web Development I	4
Computer Info	ormation Systems Degree Cours	ses	CS 133U	C Programming	4
Code	Title	Credits	CS 160	Exploring Computer Science *	4
CIS 121	Information Systems and Programming *	4	CS 161A	Programming and Problem Solving I	4
CIS 122	Introduction to Programming Logic *	4	CS 161B	Programming and Problem Solving II	4
CIS 140M	Operating Systems I: Microsoft	4	EET 178	Computing Environments for Technicians	4
or CIS 140L	Introduction to Linux/UNIX	4	Advanced Courses	Computing Environments for recrimicians	4
CIS 179		4	CIS 225	Final Haar Company	4
	Data Communication Concepts I	4		End User Support	4
CIS 184C	Introduction to Information Security	4	CIS 233J	Java Programming II	4
CIS 234A	Real-World Programming	4	CIS 233N	Intermediate C#.NET Programming	4
or CIS 280D	Cooperative Education: Application		CIS 233W	JavaScript for Web Developers II	4
010.044	Development	4	CIS 233Y	Python Programming II	4
CIS 244	Systems Analysis	4	CIS 234A	Real-World Programming	4
CIS 275	Data Modeling and SQL Introduction	4	CIS 234R	Secure Coding	4
WR 121	Composition I (WR121=WR121Z) Z	4	CIS 240L	Linux Installation and Configuration	4
WR 122	Composition II (WR122=WR122Z) Z	4	CIS 240M	Managing a Windows Server	4
or WR 227	Technical Writing (WR227=WR227Z)			Environment	
CIS Program Electi		32	CIS 244	Systems Analysis	4
CIS Programming E		8	CIS 245	Project Management - Information	4
CIS Program Busin	ess Electives	6		Systems	
General Education:	: 2 courses		CIS 275	Data Modeling and SQL Introduction	4
Total Credits		92	CIS 276	Advanced SQL	4
			CIS 277A	Data Analytics	4
	s General Education		CIS 2770	Advanced Database Concepts in Oracle	4
	ctives - 32 credits total from Introductory		CIS 277S	Introduction to Data Science	4
Advanced Electives	nced Electives. A minimum of 16 credits fro	om	CIS 277T	Web Business Intelligence Application	4
	r Information Systems AAS Degree, eight cre	edits		Development	
	electives must be a two-term sequence from		CIS 278	Data Communication Concepts II	4
Programming Ele			CIS 278A	Cisco 1: Introduction to Networks	4
Z This course is pa	rt of Oregon Common Course Numbering. T	he	CIS 279L	Linux Network Administration	4
following courses WR 121 and WR	121Z		CIS 280D	Cooperative Education: Application Development <sup>1</sup>	4
WR 122 and WR WR 227 and WR			CIS 284C	Cybersecurity Concepts	4
WITZZ7 and WIT			CIS 285E	Ethical Hacking	4
0014514755	JEODA A TION OVOTENO DE OCI		CIS 286	Computer Forensics	4
	NFORMATION SYSTEMS PROGI	≺AM	CIS 287M	Microsoft Server Security	4
ELECTIVES			CIS 288M	Microsoft Network Administration	4
Code	Title	Credits	CIS 289M	Microsoft Active Directory Administration	4
Introductory Course	es		CIS 295N	JavaScript Programming Using Node.js II	4
CIS 120	Digital Literacy	4	CIS 295P	PHP Web Development II	4
CIS 125D	Database Application Development I	4	CS 162	Computer Science II *	4
CIS 133J	Java Programming I	4	CS 201	Computer Systems	4
CIS 133N	Introduction to Programming Using	4	CS 260	Data Structures	4
2.0 .00.1	C#.NET		CS 261	Programming Systems	4
CIS 133W	JavaScript for Web Developers	4		J ,	
CIS 133Y	Python Programming I	4	* Could be used as	General Education	
CIS 134	UI/UX Design	4			
	-				

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 169Z	Data Analysis Using Microsoft Excel (BA216A=BA 169Z) Z	4
BA 205	Business Communication Using Technology	4
BA 206	Management Fundamentals	4
BA 211	Principles of Financial Accounting (BA211=BA211Z) <sup>Z</sup>	4
BA 212	Principles of Accounting II	3
BA 213	Principles of Managerial Accounting (BA213=BA213Z) <sup>Z</sup>	4
BA 223	Principles of Marketing	4
BA 226	Introduction to Business Law (BA 226=BA 226Z) <sup>Z</sup>	4
EC 201	Principles of Microeconomics (EC 201=EC 201Z) *,Z	4
EC 202	Principles of Macroeconomics (EC 202=EC 202Z) *,Z	4

- \* Could be used as General Education
- Z This course is part of Oregon Common Course Numbering. The following courses are equivalent:

  BA 211 and BA 2117

BA 211 and BA 211Z BA 213 and BA 213Z BA 216A and BA 169Z BA 226 and BA 226Z EC 201 and EC 201Z EC 202 and EC 202Z

#### **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**

Total Credits		92
General Education:	2 courses	
CIS First Term Progr	ramming Elective	4
CIS Program Busine	ess Electives	6
CIS Network Admini	stration Degree Electives 1	28
or WR 227	Technical Writing (WR227=WR227Z)	
WR 122	Composition II (WR122=WR122Z) Z	4
WR 121	Composition I (WR121=WR121Z) Z	4
or CIS 279L	Linux Network Administration	
CIS 288M	Microsoft Network Administration	4
or CIS 240L	Linux Installation and Configuration	
010 240W	Environment	7
CIS 240M	Managing a Windows Server	4
CIS 184C	Introduction to Cloud Computing  Introduction to Information Security	4
CIS 179	Introduction to Cloud Computing	4
CIS 179	Data Communication Concepts I	4
or CIS 225	Troubleshooting End User Support	
CIS 145	Microcomputer Hardware and	4
CIS 140M	Operating Systems I: Microsoft	4
CIS 140L	Introduction to Linux/UNIX	4
CIS 122	Introduction to Programming Logic ^	4
CIS 121	Information Systems and Programming *	4
Code	Title	Credits

- \* Could be used as General Education.
- 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 WR 122Z WR 227 and WR 227Z

### 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 122

Introduction to Programming Logic \*

CIS 285E	Ethical Hacking	4	CIS 140L	Introduction to Linux/UNIX	4
CIS 286	Computer Forensics	4	CIS 140M	Operating Systems I: Microsoft	4
CIS 287M	Microsoft Server Security	4	CIS 179	Data Communication Concepts I	4
CIS 288M	Microsoft Network Administration	4	CIS 184C	Introduction to Information Security	4
CIS 289M	Microsoft Active Directory Administrati	on 4	CIS 240L	Linux Installation and Configuration	4
COMPUTER	INFORMATION SYSTEMS PRO	GRAM	CIS 240M	Managing a Windows Server Environment	4
BUSINESS I	ELECTIVES		CIS 284C	Cybersecurity Concepts	4
Code	Title	Credits	WR 121	Composition I (WR121=WR121Z) Z	4
			WR 227	Technical Writing (WR227=WR227Z) Z	4
BA 111	Introduction to Accounting	3		rogramming Elective	4
BA 169Z	Data Analysis Using Microsoft Excel (BA216A=BA 169Z)	4		ty Degree Electives 1	23
BA 205	Business Communication Using Technology	4	CIS Cybersecuri	ty Advanced Electives	8
BA 206	Management Fundamentals	4		ty Business Electives	6
BA 211	Principles of Financial Accounting	4	General Education	on: 2 courses	
	(BA211=BA211Z) <sup>Z</sup>		Total Credits		91
BA 212	Principles of Accounting II	3	* Could be used	l as General Education.	
BA 213	Principles of Managerial Accounting	4		Electives - at least 8 credits must be at the	200 level.
	(BA213=BA213Z) Z			part of Oregon Common Course Numbering	g. The
BA 223	Principles of Marketing	4		ses are equivalent:	
BA 226	Introduction to Business Law (BA 226=BA 226Z) Z	4	WR 121 and W WR 227 and W		
EC 201	Principles of Microeconomics (EC 201=EC 201Z) *,Z	4			
EC 202	Principles of Macroeconomics (EC	4	CIS FIRST T	ERM PROGRAMMING ELECTIV	E
LO 202	202=EC 202Z) *, <sup>Z</sup>	4	Code	Title	Credits
	202-20 2022)		CIS 133J	Java Programming I	4
	l as General Education part of Oregon Common Course Numberin	a The	CIS 133N	Introduction to Programming Using C#.NET	4
	ses are equivalent:	g. 1110	CIS 133W	JavaScript for Web Developers	4
BA 211 and B			CIS 133Y	Python Programming I	4
BA 213 and B			CIS 195P	PHP Web Development I	4
BA 216A and I			CS 161B	Programming and Problem Solving II	4
BA 226 and BA EC 201 and E0					4
EC 202 and E	C 202Z			URITY DEGREE ELECTIVES	
			Code	Title	Credits
COMPUTER	INFORMATION SYSTEMS FIRS	ST	CIS 120	Digital Literacy	4
	GRAMMING ELECTIVE		CIS 135M	Mobile Application Programming for Android	4
Code	Title	Credits	CIS 145	Microcomputer Hardware and	4
CIS 133J	Java Programming I	4		Troubleshooting	
CIS 133N	Introduction to Programming Using	4	CIS 182	Introduction to Cloud Computing	4
	C#.NET		CIS 188	Introduction to Wireless Networking	4
CIS 133W	JavaScript for Web Developers	4	CIS 189	Wireless Security	4
CIS 133Y	Python Programming I	4	CIS 225	End User Support	4
CIS 195P	PHP Web Development I	4	CIS 233J	Java Programming II	4
CS 161B	Programming and Problem Solving II	4	CIS 233N	Intermediate C#.NET Programming	4
CVDEDGEC	URITY AAS DEGREE		CIS 233W	JavaScript for Web Developers II	4
			CIS 233Y	Python Programming II	4
	dits. Students must also meet Associate De		CIS 234A	Real-World Programming	4
	Requirements and Associate of Applied Sc tudents must complete a total of four cours		CIS 234R	Secure Coding	4
	on. Some courses specified within the prog		CIS 244	Systems Analysis	4
be used as Gen	eral Education. In addition to required cours	ses in	CIS 275	Data Modeling and SQL Introduction	4
the program of s	tudy, students must satisfy MTH 58/65 com	petency.	CIS 276	Advanced SQL	4
Students should	consult with program advisors for course p	lanning.	CIS 278	Data Communication Concepts II	4
Cybersecur	ity Degree Courses		CIS 278A	Cisco 1: Introduction to Networks	4
Code	Title	Credits	CIS 279L	Linux Network Administration	4
CIS 121	Information Systems and Programming	*	CIS 280D	Cooperative Education: Application	1-4
010 141	minormation bysterns and Frogramming	4	210 2000	Sooperative Education. Application	1-4

Development

CIS 285E	Ethical Hacking	4	CIS 234A	Real-World Programming	4		
CIS 286	Computer Forensics	4	or CIS 280D	Cooperative Education: Application			
CIS 287M	Microsoft Server Security	4		Development			
CIS 288M	Microsoft Network Administration	4	CIS 234R	Secure Coding	4		
CIS 289M	Microsoft Active Directory Administration	1 4	CIS 275	Data Modeling and SQL Introduction	4		
CIS 295P	PHP Web Development II	4	CIS 277A	Data Analytics	4		
CJA 117	Introduction to Homeland Security	3	ART 116	Basic Design: Color Foundations *	4		
CS 162	Computer Science II	4	MM 120	Multimedia Design	2		
'			MM 220	Multimedia Design II	3		
CYBERSECUR	RITY ADVANCED ELECTIVES		WR 121	Composition I (WR121=WR121Z) Z	4		
Code	Title	Credits	WR 122	Composition II (WR122=WR122Z) Z	4		
CIS 234R	Secure Coding	4	or WR 227	Technical Writing (WR227=WR227Z)			
CIS 285E	Ethical Hacking	4	Web Development	and Design 2nd Year Electives: 2 courses	8		
CIS 286	Computer Forensics	4	General Education	n: 2 courses			
CIS 287M	Microsoft Server Security	4	Total Credits		91		
CYBERSECURITY BUSINESS ELECTIVES							

Code	Title	Credits
BA 111	Introduction to Accounting	3
BA 169Z	Data Analysis Using Microsoft Excel (BA216A=BA 169Z)	4
BA 205	Business Communication Using Technology	4
BA 206	Management Fundamentals	4
BA 211	Principles of Financial Accounting (BA211=BA211Z)	4
BA 213	Principles of Managerial Accounting (BA213=BA213Z)	4
BA 226	Introduction to Business Law (BA 226=BA 226Z) <sup>Z</sup>	4

Z This course is part of Oregon Common Course Numbering. The following courses are equivalent:

BA 211 and BA 211Z BA 213 and BA 213Z BA 216A and BA 169Z BA 226 and BA 226Z

#### WEB DEVELOPMENT AND DESIGN 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.

#### **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 134	UI/UX Design	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

#### \* 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 169Z	Data Analysis Using Microsoft Excel (BA216A=BA 169Z) <sup>Z</sup>	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 I	1 4
MUC 206	Body Interface Design	4
MUC 278	Generative Art on the Web	4

Z This course is part of Oregon Common Course Numbering. BA 216A and BA 169Z are equivalent.

#### **ONE-YEAR CERTIFICATE**

Computer Information Systems (p. 6)

#### LESS THAN ONE-YEAR CERTIFICATE

Advanced Windows Network Security C# Application Programming (p. 7) Cisco Networking (p. 7) Cybersecurity Foundations (p. 7) Database Design and SQL (p. 8) Java Application Programming (p. 8) Network Administration: Linux Server (p. 8) Network Administration: Microsoft Server (p. 8) Network Security - Linux (p. 8) Network Security - Windows (p. 8) Python Application Programming (p. 8) Secure Programming (p. 8)

Web Application D	evelopment (p. 9)		CIS 133W	JavaScript for Web Developers	4
ADVANCED V	VINDOWS NETWORK		CIS 133Y	Python Programming I	4
	SS THAN ONE-YEAR CERTI	FICATE	CIS 134	UI/UX Design	4
	s. Students must meet all certificate requ		CIS 135M	Mobile Application Programming for Android	4
Advanced Win	ndows Network Security Cer	tificate	CIS 140L	Introduction to Linux/UNIX	4
Courses	,		CIS 140M	Operating Systems I: Microsoft	4
Courses			CIS 145	Microcomputer Hardware and Troubleshooting	4
Code	Title	Credits	CIS 181	CMS Web Development	4
CIS 189	Wireless Security	4	CIS 182	Introduction to Cloud Computing	4
CIS 240M	Managing a Windows Server	4	CIS 188	Introduction to Wireless Networking	4
	Environment		CIS 189	Wireless Security	4
CIS 284C	Cybersecurity Concepts	4	CIS 195H	HTML and CSS	4
CIS 278	Data Communication Concepts II	4	CIS 195N	JavaScript Programming Using Node.js I	4
or CIS 278A	Cisco 1: Introduction to Networks		CIS 195P	PHP Web Development I	4
CIS 287M	Microsoft Server Security	4	CS 133U	C Programming	4
CIS 288M	Microsoft Network Administration	4	CS 160	Exploring Computer Science *	4
CIS 289M	Microsoft Active Directory Administra	tion 4	CS 161A	Programming and Problem Solving I	4
Total Credits		28	CS 161B	Programming and Problem Solving II	4
COMPLITED	NFORMATION SYSTEMS ON	E_VEAD	EET 178	Computing Environments for Technicians	4
		L- I LAN	Advanced Courses		
CERTIFICATE			CIS 225	End User Support	4
Minimum 47 credits	s. Students must meet all certificate requ	uirements.	CIS 233J	Java Programming II	4
Computer Info	ormation Systems Certificate	<b>:</b>	CIS 233N	Intermediate C#.NET Programming	4
Courses	-		CIS 233W	JavaScript for Web Developers II	4
Code	Title	Credits	CIS 233Y	Python Programming II	4
CIS 121	Information Systems and Programmin		CIS 234A	Real-World Programming	4
CIS 121	Introduction to Programming Logic §	4	CIS 234R	Secure Coding	4
CIS 140M	Operating Systems I: Microsoft	4	CIS 240L	Linux Installation and Configuration	4
or CIS 140L	Introduction to Linux/UNIX	4	CIS 240M	Managing a Windows Server	4
CIS 179		4		Environment	
	Data Communication Concepts I	4	CIS 244	Systems Analysis	4
CIS 184C WR 121	Introduction to Information Security Composition I (WR121=WR121Z) Z	4 4	CIS 245	Project Management - Information	4
	Composition II (WR122=WR122Z) §,Z	4		Systems	
WR 122 or WR 227	Technical Writing (WR227=WR227Z)	4	CIS 275	Data Modeling and SQL Introduction	4
	• .	10	CIS 276	Advanced SQL	4
-	ives (see list below)	12 3	CIS 277A	Data Analytics	4
	ness Electives (see list below)		CIS 2770	Advanced Database Concepts in Oracle	4
	Human Relations Elective (see list belo		CIS 277S	Introduction to Data Science	4
Total Credits		47	CIS 277T	Web Business Intelligence Application Development	4
	Related Instruction and cannot be subseleted Instruction details can be viewer		CIS 278	Data Communication Concepts II	4
	irt of Oregon Common Course Numberir		CIS 278A	Cisco 1: Introduction to Networks	4
following courses		ig. 1110	CIS 279L	Linux Network Administration	4
WR 121 and WR WR 122 and WR	121Z 122Z		CIS 280D	Cooperative Education: Application Development <sup>1</sup>	4
WR 227 and WR	227Z		CIS 284C	Cybersecurity Concepts	4
			CIS 285E	Ethical Hacking	4
COMPLITED	NEODMATION SYSTEMS DD		CIS 286	Computer Forensics	4
	NFORMATION SYSTEMS PRO	JUNAIVI	CIS 287M	Microsoft Server Security	4
ELECTIVES			CIS 288M	Microsoft Network Administration	4
Code	Title	Credits	CIS 289M	Microsoft Active Directory Administration	4
Introductory Cours	es		CIS 295N	JavaScript Programming Using Node.js II	4
CIS 120	Digital Literacy	4	CIS 295P	PHP Web Development II	4
CIS 125D	Database Application Development I	4	CS 162	Computer Science II *	4
CIS 133J	Java Programming I	4	CS 201	Computer Systems	4
CIS 133N	Introduction to Programming Using C#.NET	4			

CS 260	Data Structures	4	SOC 204	Introduction to Sociology (SOC	4
CS 261	Programming Systems	4		204=SOC 204Z) <sup>2</sup>	
* Could be used as General Education			SOC 205	Social Change and Institutions (SOC 205=SOC 205Z) Z	4
A maximum of four CIS 280D credits can be applied toward the CIS degree. Additional credits, up to a maximum of eight, may			SOC 206	Social Problems (SOC 206=SOC 206Z) Z	4
			SOC 213	Diversity in the United States	4
	ward the degree, but must be approved by a CIS		SOC 218	Sociology of Gender	4
Department chair.			SOC 232	Death and Dying: Culture and Issues	4
OOMBUTEE	NINEODMATION OVOTEMO DDOODM		WS 101	Women's Studies	4

### COMPUTER INFORMATION SYSTEMS PROGRAM BUSINESS ELECTIVES

Code	Title	Credits
BA 111	Introduction to Accounting	3
BA 169Z	Data Analysis Using Microsoft Excel (BA216A=BA 169Z)	4
BA 205	Business Communication Using Technology	4
BA 206	Management Fundamentals	4
BA 211	Principles of Financial Accounting (BA211=BA211Z)	4
BA 212	Principles of Accounting II	3
BA 213	Principles of Managerial Accounting (BA213=BA213Z)	4
BA 223	Principles of Marketing	4
BA 226	Introduction to Business Law (BA 226=BA 226Z)	4
EC 201	Principles of Microeconomics (EC 201=EC 201Z) *,Z	4
EC 202	Principles of Macroeconomics (EC 202=EC 202Z) *, <sup>Z</sup>	4

<sup>\*</sup> Could be used as General Education

BA 211 and BA 211Z BA 213 and BA 213Z BA 216A and BA 169Z BA 226 and BA 226Z EC 201 and EC 201Z EC 202 and EC 202Z

### 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 I (PSY201A=PSY201AZ) <sup>Z</sup>	4
PSY 202A	Introduction to Psychology II (PSY202A=PSY202AZ) <sup>Z</sup>	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

### Z This course is part of Oregon Common Course Numbering. The following courses are equivalent:

SOC 204 and SOC 204Z SOC 205 and SOC 205Z SOC 206 and SOC 206Z PSY 201A and PSY 201AZ PSY 202A and PSY 202AZ

### 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

### CISCO NETWORKING LESS THAN ONE-YEAR CERTIFICATE

Minimum 16 credits. Students must meet all certificate requirements.

### **Cisco Networking Certificate Courses**

Code	Title	Credits
CIS 179	Data Communication Concepts I	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
Total Credits		16

### 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

Z This course is part of Oregon Common Course Numbering. The following courses are equivalent:

### 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 Cre	edits
CIS 122	Introduction to Programming Logic	4
or CIS 135M	Mobile Application Programming for Androic	t
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 140L	Introduction to Linux/UNIX	4
or CS 140U	Introduction to UNIX	
CIS 179	Data Communication Concepts I	4
CIS 240L	Linux Installation and Configuration	4
CIS 279L	Linux Network Administration	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	1 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 279L	Linux Network Administration	4
CIS 278	Data Communication Concepts II	4
or CIS 278A	Cisco 1: Introduction to Networks	
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**

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Code	Title	Credits
CIS 189	Wireless Security	4
CIS 240M	Managing a Windows Server Environment	4
CIS 284C	Cybersecurity Concepts	4
CIS 278	Data Communication Concepts II	4
or CIS 278A	Cisco 1: Introduction to Networks	
Total Credits		16

#### PYTHON APPLICATION PROGRAMMING

Minimum 16 credits. Students must meet all certificate requirements.

### Python Application Programming Certificate Courses

Code	Title	Credits
CIS 122	Introduction to Programming Logic	4
CIS 133Y	Python Programming I	4
CIS 233Y	Python Programming II	4
CIS 234A	Real-World Programming	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 140L	Introduction to Linux/UNIX	4
or CS 140U	Introduction to UNIX	
CIS 184C	Introduction to Information Security	4
CIS 234R	Secure Coding	4
CIS 275	Data Modeling and SQL Introduction	4
CIS Programming Electives <sup>1</sup>		8
Total Credits		24

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

### **CIS Programming Electives**

Code	Title	Credits
CIS 133J	Java Programming I	8
& CIS 233.I	and Java Programming II	

### **COMPUTER INFORMATION SYSTEMS**

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

### 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