	Spring
BA 195 Service and Ethics in Business *,D,G	1
BA 214 Business Communications *,D,G	4
BA 218 Personal Finance D,G	4
Choice of:	4
BT 144 Administrative Procedures *,D,G	
BT 175 Survey of Accounting Software *,B,D,G	
Total Credits	13

Computer Network Operations

Offered by the Computer Information Technology Department

Two-Year Associate of Applied Science Degree

Less-Than-One-Year Certificate of Completion, Computer Network Security

Purpose To train entry-level network support technicians and more advanced network administrators in specific computer networking skills and general troubleshooting of hardware and software related problems.

Learning Outcomes The graduate will:

- install and configure workstations, servers and networked printers.
- install and configure internetworking devices such as switches and routers.
- install and configure a variety of network operating systems and provide for interoperability between them.
- administer an organization's computer network infrastructure.
- understand network security issues and use appropriate tools to insure network integrity.
- understand the critical features of wireless networking.
- understand fundamental networking theory, terminology, and industry recognized standards.
- interpret the concepts of a computer network related problem-solving task.
- use appropriate library and information resources to research network management issues and tools and support lifelong technical learning.

Employment Trends The Oregon Labor Market Information System projects statewide 359 annual openings for network and computer systems administrators and computer support specialists, and 42 annual openings in Lane County. For the decade ending in 2014, the statewide projected increase is 21% annually, and for Lane County 23% annually.

Wages Statewide average hourly wage for network and computer systems administrators is $27.19, and annually $58,299. Lane County average hourly wage is $25.17, and annually $52,368.

Costs in Addition to Tuition (estimate)*

Books $2,500-3,000

Students taking courses using CIT labs are assessed a one-time fee up to $28 per term. See the CIT department for details.
* Subject to change without notice.

Prerequisites Students must qualify for WR 121 either by placement testing or completing prerequisite courses, and by the third term, qualify to begin MTH 095. Each student should consult with a counselor to plan a program of study.

Computer Network Security Students who complete the Computer Network Operations degree are well positioned to continue their studies in computer network security by completing the curriculum for the Network Security Certificate offered by the CIT department. See the following Computer Network Security certificate description or contact the certificate coordinator Ron Little (541) 463-5464.

Cooperative Education (Co-op) Co-op is a required and important part of the Computer Network Operations program. It provides relevant field experience that integrates theory and practice while providing opportunities to develop skills, explore career options, and network with professionals and employers in the computer network field. Contact Larry Scott, Computer Network Operations Co-op Coordinator, Bldg. 19, Rm. 154, (541) 463-5458.

Program Lead Gary Bricher (541) 463-5294

Program Counselor Rich Freund (541) 463-5435

Program Academic Advisor Shirley Lukacs (541) 463-3244

Please Note: This first-year CIT curriculum is known as the "CIT Core." Students pursuing degrees in Computer Programming, Computer Network Operations, or Computer User Support will complete the same first-year core courses. This means that a student may change degree goals at any time before the start of the second year and still be able to graduate in two years. For students who want to complete two degrees, it ensures that they will have access to second-year courses in both degrees.

First Year	Fall
ART 288 Introduction to Web Design D,G	2
CIS 100 Computing Careers Exploration D,G	2
CIS 102 Problem Solving with Computers D,G	4
CIS 125H Software Tools 1: XHTML D,G	2
CIS 140 Operating Systems: Managing Windows D,G	4
WR 121 English Composition: Exposition and Introduction to Argument *,W	4
Total Credits	18
	Winter
CS 133JS Beginning Programming Javascript *,D,G,S	4
CIS 125D Software Tools 1 Databases *,D,G	4
CS 179 Introduction to Computer Networks *,D,G	4
ELT 287 Microcomputer Hardware D,G	4
Total Credits	16
	Spring
CS 195 Web Development 1 *,D,G	4
CG 203 Human Relations at Work H	3
CIS 227N Systems Support: Network and Operating Systems *,D,G	4
MTH 095 Intermediate Algebra or higher *,M	5
Total Credits	16
Second Year	**Fall**
CS 279W Windows Server Administration *,D,G,S	4
CS 140U Introduction to Unix/Linux *,D,G	4
CS/CIS Elective 1,D,G	4
WR 227 Technical Writing *,A	4
Total Credits	16

Standard footnotes:
* Prerequisite required
A Meets Arts/Letters requirement
B Must be passed with grade of "B" or better to use as a prerequisite
D Degree or certificate requirement; must be passed with grade of "C-" or better
G Must be taken for a grade, not P/NP; major requirement
H Meets Human Relations/Social Science requirement
M Meets Mathematics requirement
P Meets PE/Health requirement
R Required for AAS degree—see page 48
S Meets Science/Math/Computer Science requirement
W Meets Written Communications or English Composition requirement

	Winter
CS 284 Network Security Fundamentals *,D,G,S	4
CIS 225 Computer End-User Support *,D,G	4
CS 240U Operating Systems Unix/Linux *,D,G	4
CS/CIS/GIS Elective 1,3,D,G	4
Total Credits	16
	Spring
CS 289 Advanced Network Topics *,D,G,S	4
CS 280CN Coop Ed: Computer Networks D,G	3
PE/Health requirement R	3
CS/CIS/GIS Elective 1,3,G or Speech Elective 2	4
Elective (optional)	4
Total Credits	18

1 Each of the three degrees of Computer Programming, Computer Network Operations, and Computer User Support contain three second year CS/CIS/GIS electives. If you are majoring in one of these three degrees, you may want to consider using your CS/CIS/GIS electives to take a sequence of courses from one of the other two degree programs. For example if you are majoring in Computer Network Operations, you could take an elective sequence from the second year courses in Computer Programming or Computer User Support. In addition you may want to consider taking your CS/CIS/GIS electives from the Game Development degree or Computer Science transfer requirements especially if you are a Computer Programming major. For more specific information about electives, see *http://www.lanecc.edu/cit/electives* or contact the program academic advisor Shirley Lukacs or program counselor Rich Freund to help determine what elective courses best fit your goals.

2 **List of approved speech electives:**

SP 100 Basic Communication
SP 111 Fundamentals of Public Speaking
SP 112 Persuasive Speech
SP 130 Business and Professional Speech
SP 219 Small Group Discussion

3 Students planning to pursue a bachelor's degree in Computer Science are advised to also complete the following courses in mathematics: MTH 111 College Algebra and MTH 231, 232, 233 Discrete Mathematics 1, 2, 3

Computer Network Security

Less-Than-One-Year Certificate of Completion

Purpose To train those who already have networking skills, to secure workstations, servers, and other networking devices.

Learning Outcomes The certificate recipient will:

- understand the security fundamentals required to help safeguard computer networks.
- implement wireless network security protections.
- identify and counteract attacks on workstations, servers, and other networking devices.
- identify vulnerabilities, discuss their resolutions, and generate vulnerability reports
- install and utilize various security industry accepts tools.
- install and configure firewalls and VPNs.
- troubleshoot security issues and implement and test resolutions.

Employment Trends The Oregon Labor Market Information System projects statewide 359 annual openings for network and computer systems administrators and computer support specialists, and 42 annual openings in Lane County. For the decade ending in 2014, the statewide projected increase is 21% annually, and for Lane County 23% annually.

Wages Statewide average hourly wage for network and computer systems administrators is $27.19, and annually $58,299. Lane County average hourly wage is $25.17, and annually $52,368.

Costs in Addition to Tuition (estimate)*

Books	$200-300

Students taking courses using CIT labs are assessed a one-time fee up to $28 per term. See the CIT department for details.
* Subject to change without notice.

Prerequisites The courses in this certificate are designed to be taken with the Computer Network Operations Associate of Applied Science degree program offered by the CIT department. There are specific prerequisites for each of the four courses required for this certificate. Each of the prerequisites is a requirement in the Network Operations degree. For details see the course description of each of the four required courses. Prerequisites can be waived for current IT network technicians with the appropriate background.

Certificate Lead Ron Little (541) 463-5464

Program Counselor Rich Freund (541) 463-5435

Program Academic Advisor Shirley Lukacs (541) 463-3244

Certificate requirements

CS 188 Wireless Networking *,D,G	4
CS 284 Network Security Fundamentals *,D,G	4
CS 285 Operating System Hardening *,D,G	4
CS 286 Firewalls and VPNs *,D,G	4
Total Credits	16

Computer Programming

Offered by the Computer Information Technology Department

Two-Year Associate of Applied Science Degree

Less-Than-One-Year Certificate of Completion, Computer Game Programming

Purpose To prepare technicians for entry-level positions as web developers.

Learning Outcomes The graduate will:

- design, implement, test, debug and document web based computer programs using a variety of current tools and technologies.
- design, implement, test, debug and document at least one other type of computer program such as: game program, database program, object oriented program.
- understand the relationship between computer programs and organizational processes.
- interpret the mathematical concepts of a programming related problem-solving task and translate them into programming logic and expressions.
- use appropriate library and information resources to research programming tools and technologies and support lifelong technical learning.

Employment Trends The Oregon Labor Market Information System project statewide 105 annual openings for Computer Programmer, and 9 annual openings for Lane County. For the decade ending in 2014, the statewide projected increase is 9 % and for Lane County 7.8 %. Related job categories such as Software Engineer, Web Developer, Systems Analyst, Database Programmer show projected increases statewide and for Lane County of 20-25%.

Wages Statewide average hourly wage is $28.90 and $62,314 annually. Lane County average hourly wage is $27.72 and $58,554 annually.