

2011 - 2012 Career and Technical Programs

Computer Information Technology Department 541.463.5826

lanecc.edu

# **Computer Network Operations**

**Two-Year Associate of Applied Science Degree** 

Career Pathway 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 problemsolving task.
- use appropriate library and information resources to research network management issues and tools and support lifelong technical learning.

## **Employment Trends**

- Lane County openings 9 annually, projected through 2018
- Statewide openings 98 annually, projected through 2018
- Annual National positions 339,500 current; 418,400 projected through 2018

### Wages

- Average hourly rate in Lane County \$29.88
- Average annual rate in Lane County \$62,156
- Average hourly rate Statewide \$32.75
- Average annual rate Statewide \$68,111

## Costs in Addition to Tuition (estimate)\*

\* 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 or advisor 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 of Completion offered by the CIT department. See the following Computer Network Security Certificate of Completion description or contact the certificate coordinator Ron Little, 541.463.5464, littler@lanecc.edu

**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 the Cooperative Education Division, Bldg. 19, Rm. 231, 541.463.5203.

**Program Lead** Gary Bricher, Bldg. 19, Room 148, 541.463.5294, *bricherg@lanecc.edu* 

**Note** Students completing the curriculum for the Computer Network Operations degree will also satisfy the requirements for the Computer Specialist certificate. In addition, students taking CS 296P Web Development 2: PHP as the fall term, second-year elective will satisfy the requirements for the Web Programming certificate. Students taking CS 188 Wireless Networking, and CS 285 Operating System Hardening as the winter and spring term, second-year electives would need to complete only one additional course, CS 286 Firewalls and VPNs, to qualify for the Computer Network Security certificate.

## **Computer Network Operations**

First Year	Fall
CIS 100 Computing Careers Exploration <sup>D,G</sup>	2
CIS 102 Problem Solving with Computers <sup>D,G</sup>	4
CIS 195 Web Authoring <sup>1 D,G</sup>	3
CIS 140 Operating Systems: Managing Windows <sup>D,G</sup>	4
WR 121 Introduction to Academic Writing *	4

Total Credits

Total Credits	17
ART 288 Introduction to Web Design <sup>D,G</sup> CS 133JS Beginning Programming JavaScript <sup>*,4,D,G</sup> CIS 125D Software Tools 1 Databases <sup>D,G</sup> CS 179 Introduction to Computer Networks <sup>*,D,G</sup> ET 287 Microcomputer Hardware <sup>D,G</sup>	Winter 2 4 4 4 4
Total Credits	18
CS 206A Coop Ed: Computer Networks Seminar 1 <sup>D</sup> CS 295P Web Development 1: PHP *.4.D.G CG 203 Human Relations at Work CIS 227N Systems Support: Network and Operating Systems *.D.G MTH 095 Intermediate Algebra or higher *	<b>Spring</b> 1 4 3 4 5
Total Credits	17
Second Year CS 279W Windows Server Administration <sup>*,D,G</sup> CIS 140U Introduction to Unix/Linux <sup>*,D,G</sup> CS/CIS/GIS Elective <sup>1,3,D,G</sup> WR 227 Technical Writing <sup>*</sup>	Fall 4 4 4

**Total Credits** 16

	Winter
CS 206B Coop Ed: Computer Networks Seminar 2 <sup>D</sup>	1
CS 284 Network Security Fundamentals *,D,G	4
CIS 225 Computer End-User Support *,D,G	4
CS 240U Advanced Unix/Linux: Server	
Management *,D,G	4
CS/CIS/GIS Elective <sup>1,3,D,G</sup>	4
	17

	Spring
CS 289 Cisco Router and Switch Administration *,D,G	4
CS 280CN Coop Ed: Computer Networks <sup>D,G</sup>	3
PE/Health requirement <sup>R</sup>	3
CS/CIS/GIS Electives <sup>1,3,G</sup> or Speech Elective <sup>2</sup>	4-8

#### **Total Credits** 14-18

The Computer Network Operations degree contains three second-year 1 CS/CIS/GIS electives. Students may want to consider using CS/CIS/GIS electives to take a sequence of courses from the Network Security certificate curriculum, or from one of the other degree or certificate programs, such as, Computer Programming, Computer Simulation and Game Development, Geographic Information Systems, Computer Information Systems - Health Informatics or Computer Science transfer area. For more specific information about electives, students should contact the program academic advisor or program counselor to help determine what elective courses best fit their 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
- Instead of CIS 133JS and CS 295Pthe student may take any two required programming courses that are a sequence from one of the other CIT degree programs.

## **Computer Network Security**

## **Career Pathway 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 accepted tools.
- install and configure firewalls and VPNs.
- troubleshoot security issues and implement and test resolutions.

## Costs in Addition to Tuition (estimate)\*

Books and lab fees ..... \$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 of Completion 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, Bldg. 19, Room 156, 541.463.5464, littler@lanecc.edu

<b>Courses required</b>	Credits
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

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- Standard footnotes
- Prereauisite required
- В Must be passed with grade of "B" or better to use as a prerequisite
- Degree or certificate requirement; must be passed with grade of "C-" or better D

G Must be taken for a grade, not P/NP; major requirement R Required for AAS degree