

## Computer Game Programming in C++

### Less-Than-One-Year Certificate of Completion

**Purpose** To provide students with the knowledge and skills required to program in C++, specifically focused on simulation and game programming.

**Learning Outcomes** The certificate recipient will:

- understand the syntax and semantics of C++ programming.
- demonstrate the ability to solve programming projects using an object oriented methodology.
- understand and use common data structures to solve programming problems.
- design, develop, test, debug, and document solutions to simulation and computer game problems using a variety of current tools,
- demonstrate the knowledge of common software engineering methodologies.
- develop a portfolio of programs working in a team oriented environment.

**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.

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

Books ..... \$150-\$200  
 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 are expected to be comfortable working on a computer, including the ability to create files with a text editor and manage file folders. CS 260 has a prerequisite of MTH 111.

**Certificate Lead** Jim Bailey, (541) 463-3148

**Program Counselor** Rich Freund, (541) 463-5435

**Program Academic Advisor** Shirley Lukacs, (541) 463-3244

Courses required	Credits
CS 133G Beginning C++ Programming for Games <sup>D,G</sup> ,.....	4
CS 233G Intermediate C++ Programming for Games <sup>*,D,G</sup> ,.....	4
CS 260 Data Structures <sup>*,D,G</sup> ,.....	4
CS 234G Advanced C++ Programming for Games <sup>*,D,G</sup> ,.....	4
Total Credits	16

## Computer Simulation and Game Development

See Simulation and Game Development, page 120.

## Computer Specialist

**Offered by the Computer Information Technology Department**

### One-Year Certificate of Completion

**Purpose** To prepare specialists in the use of computer information systems. Specialists use a computer’s capabilities as a problem-solving tool for positions that require end-user knowledge of computer hardware, software, and operating procedures.

**Learning Outcomes** The graduate will:

- have a broad range of skills necessary to be an effective user of information systems.
- have core skills in the use of computers, as well as the related skill areas of mathematics and writing.
- use appropriate library and information resources to research user support issues, concepts, and tools and support lifelong technical learning.
- install and configure operating system software
- interpret the concepts of a problem-solving task
- manipulate variables using computer software applications
- collect and display data as lists, tables, and charts using computer software
- design web pages and post them to the internet

**Employment Trends** The state economist forecasts 133 openings annually for Lane County over the next decade and 950 statewide in Oregon. This remains one of the fastest growing job categories in the county, state and the nation.

**Wages** Starting wages in Lane County are \$13.66 per hour and \$28,407 annually; statewide in Oregon, starting wages are \$14.05 per hour and \$29,239 annually.

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

Books and lab fees ..... \$1,800  
 Students taking Computer Information Technology courses that use the CIT Department labs are assessed a one-time fee up to \$28 per term. See the 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.

**Security Specialization** 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 certificate description elsewhere in this catalog or contact the certificate coordinator Ron Little (541) 463-5464.

**Cooperative Education (Co-op)** Co-op is an important part of the Computer Applications Specialist 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 field. Contact Larry Scott, Computer Applications Specialist Co-op Coordinator, Bldg. 19, Rm. 154, (541) 463-5458.

**Program Lead** Bob Barber, (541) 463-5734

**Program Counselor** Richard 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.

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

## Computer User Support

**Offered by the Computer Information Technology Department**

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

**Note:** Computer User Support is suspended for academic year 2007-08 pending curriculum revisions. Students interested in this area of study should consider taking the CIT Core, described under Computer Network Operations. Contact CIT department for details.

**Purpose** To prepare graduates for entry-level positions that provide technical support, assistance, troubleshooting, training and documentation to computer end users. Positions include User Support Specialist, Customer Support Representative, and Software Trainer.

**Learning Outcomes** The graduate will:

- set up, install, configure, and troubleshoot hardware.
- install, configure, upgrade, maintain, and troubleshoot software.
- solve problems using recognized problem-solving methods.
- write and edit user documentation.
- prepare training materials and train end-users.
- administer and support computer networks.
- assess user needs and recommend computer solutions.
- perform computer facilities management tasks.
- use appropriate library and information resources to research user support issues, concepts, and tools and support lifelong technical learning.
- interpret the concepts of a problem-solving task and translate them into mathematical formulas and algorithms.
- manipulate variables using computer software applications.
- collect and display data as lists, tables, and charts using computer software.

**Employment Trends** A job growth rate of 27.7 percent is expected over the period 2004-2014 for Computer Support Specialists in Lane County, representing 220 new jobs during that time with annual openings estimated at 34. Statewide in Oregon, a 23.4% increase is expected over the period 2004-2014, representing 1,667 new jobs with annual openings estimated at 270. While these projections may change with current conditions, Computer Support Specialist remains one of the fastest growing job categories in the county, state, and nation.

**Wages** Average hourly wages for Computer User Support Specialists are \$20.17 per hour and \$41,953 annually. In Lane County, average hourly wages for Computer Support Specialists are \$17.91 per hour and \$37,256 annually.

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

Additional costs for two-year degree program ..... \$3,200  
Students taking Computer Information Technology courses, which use the Computer Information Technology. Department labs, are assessed a one-time fee up to \$28 per term. See the 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.

**Number of New Students Admitted Annually** Approximately 25 students per year enter the second year of this program.

**Security Specialization** 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 certificate description elsewhere in this catalog 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 User Support 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 field. Contact Larry Scott, Computer User Support Co-op Coordinator, Bldg. 19, Rm. 154, (541) 463-5458.

**Program Lead** Bob Barber, (541) 463-5734

**Program Counselor** Richard 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 students may change their degree goal at any time before the start of their 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.

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