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Students planning to **transfer** to a four-year college or university should refer to the ASSIST web site at [www.assist.org](http://www.assist.org) and **consult a counselor** before beginning a program of study. Please call (562)938-4561 (LAC) or (562) 938-3920 (PCC) to schedule a counseling appointment. Students may also wish to visit the Transfer Center on either campus.

Program of study leading to: <b>Associate in Science (A.S.) Degree</b>				
<b>COMPUTER NETWORKING REQUIRED COURSES:</b>		<b>UNITS</b>	<b>In Progress</b>	<b>Completed Grade</b>
BCOM 15	Business Communications	3		
COSA 50	Introduction to IT Concepts & Applications	4		
COSN 5	Computer Hardware Fundamentals	4		
COSN 10	Networking Fundamentals	4		
COSN 205	UNIX/LINUX Fundamentals	4		
COSN 225	Microsoft Windows Client	3		
COSN 299	Security and Networking Capstone	4		
COSS 271	Networking Security Fundamentals	3		
<b>Subtotal Units</b>		<b>29</b>		
<b>IN ADDITION, select ONE (1) courses from the following:</b>		<b>UNITS</b>	<b>In Progress</b>	<b>Completed Grade</b>
BCOM 222	Job Search Skills	3		
COSE 271WE	Work Experience – Computer & Office Studies	1-4		
COSA 210	Intro to Project Management for IT	3		
COSN 200	Wireless and Mobile Devices	3		
COSN 210	LINUX Server Administration	4		
COSN 215	LINUX Networking and Security	4		
COSN 230	Microsoft Windows Server	4		
COSN 250	Cloud Computing in Amazon Web Services	3		
COSP 8	Visual BASIC Programming	4		
COSS 272	Computer Forensics and Investigation	3		
COSS 273	Ethical Hacking and Countermeasures	4		
† CS 11	Introduction to Computer Science-C++	4		
† CS 21	Introduction to Computer Science-Java	4		
<b>Subtotal Units</b>		<b>1-4</b>		
<b>TOTAL UNITS</b>		<b>30-33</b>		

For graduation with an **Associate in Science (A.S.) Degree with a major in Computer Security & Networking:**

- Minimum Unit Requirements:** Any course that appears on a curriculum guide and the General Education Pattern (Plan A) may fulfill both major and general education requirements (Approved by College Curriculum Committee Spring 2012). For this degree, complete a minimum of 60 units in courses numbered 1-599. Please note that additional elective units may be required to meet this minimum based upon courses selected to fulfill General Education for the Associate Degree.

**Associate Degree requirements continued from previous page.**

Computer Security and Networking: 30-33 Units  
 General Education § 19 Units  
 Degree Total 60 Units

- Scholarship:** Maintain an **overall grade point average (GPA) of 2.0** (“C” average) based on all accredited college work applied to the degree, no matter where completed. For this **field of concentration, complete each course above** with a **grade of “C” or higher**, or “P” if course is graded on a P/NP basis.
- Residence for the Degree:** Complete at least 12 semester units of the required 60 semester units in residence at Long Beach City College in order for the college to grant an Associate of Arts and/or an Associate of Science Degree.
- Residence for the Field of Concentration:** Complete fifty percent (50%) or more of the unit requirements for this field of concentration in residence; this means at **least 15-16.5 units** of the required 30-33 units. Credit earned by exam, where applicable, may be included.
- General Education and Proficiency Requirements:** Complete the required A.A./A.S. General Education and Proficiency requirements\*, otherwise known as “Plan A”. For Plan A requirements, refer to the general catalog or view it online at <http://osca.lbcc.edu> .
- Complete and submit the degree application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at <http://admissions.lbcc.edu/>. Refer to the Schedule of Classes (<http://schedule.lbcc.edu>) and click the “Important Dates” link to view the actual deadline for each semester.

\*The requirements for general education/proficiency and the field of concentration (major) need to be from the same catalog year. This catalog year may be any year between the years of initial enrollment to the present, provided continuous enrollment is maintained throughout. See the catalog for definition of "continuous enrollment".

Program of study leading to:  
**Certificate of Achievement**

**REQUIRED COURSES**—Complete the 30-33 units of required courses as listed in the Associate Degree requirements

**Computer Security & Networking TOTAL UNITS 30-33**

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For graduation with a **Computer Security & Networking Certificate of Achievement:**

- Complete each of the **REQUIRED COURSES** listed above with a **minimum grade of “C”** or higher or “P” if course is graded on a P/NP basis.
- Complete fifty percent (50%) or more of the unit requirements for this field of concentration in residence; this means at **least 15-16.5 units** of the required 30-33 units. Credit earned by exam, where applicable, may be included.
- Complete and submit the certificate application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at <http://admissions.lbcc.edu/> . Refer to the Schedule of Classes (<http://schedule.lbcc.edu>) and click the “Important Dates” link to view the actual deadline for each semester.

Program of study leading to:  
**Certificate of Achievement**

**Certificate: Cloud Computing 3132**

<b>REQUIRED COURSES</b>		<b>UNITS</b>	<b>In Progress</b>	<b>Completed Grade</b>
COSN 250	Cloud Computing in Amazon Web Services	3		
COSN 251	Database Essentials in Amazon Web Svcs	3		
COSN 252	App Development in Amazon Web Services	3		
COSN 253	Security in Amazon Web Services	3		
COSN 10	Networking Fundamentals	4		
<b>TOTAL UNITS</b>		<b>16</b>		

For graduation with a **Cloud Computing Certificate of Achievement:**

- Complete each of the **REQUIRED COURSES** listed above with a **minimum grade of “C”** or higher or “P” if course is graded on a P/NP basis.
- Complete fifty percent (50%) or more of the unit requirements for this field of concentration in residence; this means at **least 8 units** of the required 16 units. Credit earned by exam, where applicable, may be included.

Complete and submit the certificate application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at <http://admissions.lbcc.edu/> . Refer to the Schedule of Classes (<http://schedule.lbcc.edu>) and click the “Important Dates” link to view the actual deadline for each semester.

**COMPUTER SECURITY AND NETWORKING 2019-2020**

A.S. = 2125; C-ACH (Cyber Security) = 3125; C-ACH (Cloud Computing) = 3132;  
 C-ACC = 4086; C-ACC = 4106; C-ACC = 4125; C-ACC = 4126; C-ACC = 4921

Departmental Phone: 562-938-4904 Web Site: [www.lbcc.edu/COS](http://www.lbcc.edu/COS)

Information on this sheet is subject to change without notice. Any updates to this guide are posted at <http://osca.lbcc.edu> .

Program of study leading to:  
**Certificates of Accomplishment**

**Certificate: Microsoft Windows Networking Technician 4086**

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
COSN 10	Networking Fundamentals	4		
COSN 200	Wireless and Mobile Devices	3		
COSN 225	Microsoft Windows Client	3		
COSN 230	Microsoft Windows Server	4		
<b>TOTAL UNITS</b>		<b>14</b>		

**Certificate: Cyber Security 4106**

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
COSN 10	Networking Fundamentals	4		
COSN 200	Wireless and Mobile Devices	3		
COSS 271	Network Security Fundamentals	3		
COSS 272	Computer Forensics and Investigation	3		
COSS 273	Ethical Hacking and Countermeasures	4		
<b>TOTAL UNITS</b>		<b>17</b>		

**Certificate: Computer Network Technician 4125**

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
COSN 10	Network Fundamentals	4		
COSN 200	Wireless and Mobile Devices	3		
<b>TOTAL UNITS</b>		<b>7</b>		

**Certificate: Computer Hardware Technician 4126**

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
COSA 50	Intro to IT Concepts & Applications	4		
COSN 5	Computer Hardware Fundamentals	4		
<b>TOTAL UNITS</b>		<b>8</b>		

**Certificate: UNIX Network Administrator 4921**

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
COSN 10	Network Fundamentals	4		
COSN 205	UNIX/Linux Fundamentals	4		
COSN 210	LINUX Server Administration	4		
COSN 215	LINUX Networking and Security	4		
<b>TOTAL UNITS</b>		<b>16</b>		

For graduation with a **Certificate of Accomplishment:**

1. Complete the above required courses with a minimum grade of "C", or "P" if course is graded on a P/NP basis.
2. Fifty percent (50%) or more of the required units must be completed in residence at LBCC.
3. Complete and submit the certificate application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at <http://admissions.lbcc.edu>.

## Career Opportunities

This **Associate Degree or Certificate of Achievement** is a two-year program leading to the Associate in Science (A.S.) degree. It is designed to prepare students for employment in a variety of computer related fields. Students wishing a bachelor's degree (transfer program) should meet with a counselor to discuss transferability of courses.

## Program Mission and Outcomes

The mission of the Computer Security and Networking curriculum is to skillfully train students by providing strategically designed courses to meet their academia, transferable, and career needs.

### **Outcomes:**

- Install, configure, manage and troubleshoot a small office/home office network (wired or wireless)
- Secure wired and wireless networks
- Install, configure and manage client and server operating systems
- Harden servers against intrusion.

### **Outcomes for Certificate of Achievement (Cloud Computing):**

- Design infrastructure as a Service (IaaS) solutions by provisioning computing instances, establishing virtual private networks, managing databases, and storage within a secure online environment.
- Analyze performance metrics of cloud architecture to respond dynamically to information and computing technology workloads and optimize service costs.
- Collaborate in a team designing business solutions in an industry aligned project.

### **Outcomes for Certificate of Accomplishment (Microsoft Windows Networking Technician):**

- Set up and construct a secure peer-to-peer and client server network.
- Install, configure, and backup to mobile device.
- Understand Operating System Configuration.
- Understand server roles.

### **Outcomes for Certificate of Accomplishment (Cyber Security):**

- Set up and construct a secure peer-to-peer and client server network.
- Install, configure, and backup mobile devices.
- Understand Operating System Configurations.
- Understand server roles.

### **Outcomes for Certificate of Accomplishment (Computer Hardware Technician):**

- Analyze common software and hardware problems on personal computers.
- Distinguish and explain the introductory core computer and IT concepts and technology that are used personally in society, in society, in government, and business.

### **Outcomes for Certificate of Accomplishment (Computer Network Technician):**

- Distinguish the differences between local area networks and wireless networking technologies.
- Compare and contrast various wired and wireless networking technologies.

### **Outcomes for Certificate of Accomplish (UNIX Network Administrator):**

- Install, configure, and secure a LINUX server.
- Install, configure and secure a LINUX network and services.
- Describe and document a LINUX network in relation to the OSI model.

## Legend

† This course has a prerequisite. Prerequisite courses must be complete with at least a "C" or "P" grade. Refer to the General Catalog (<http://www.lbcc.edu/cat/index.html>), the Schedule of Classes (<http://schedule.lbcc.edu/>), or the online Credit Course Outline (<http://wdb-asir.lbcc.edu/coursecurriculum/coursedetails/>) for specific prerequisite information.