

**Selected electives:**

**1st year electives:**

Contemporary Art History	ART	A102	(3)
Book Arts	ART	A286	(2)
Introduction to Business	BUS	A100/H	(3)
Children's Literature	ENGL	A143/H	(3)
Introduction to marketing	MKTG	A100	(3)

**2nd year electives:**

Color & Design 3D	ART	A111	(3)
Product Illustration	ART	A118	(3)
Printmaking	ART	A170	(3)
Watercolor	ART	A263	(3)
Cartooning	ART	A269	(3)
Photo Graphics w/Photoshop	DMAD	A193	(4)

**Total: (43-47)**

**ASSOCIATE DEGREE**

Complete the Certificate of Achievement and Associate in Arts Graduation Requirements as outlined in the Graduation Requirements section of the catalog.

## COMPUTER INFORMATION SYSTEMS

The goal of the CIS program is to provide students with the technical skills and systems perspective necessary for entry-level positions in the computer and information industry. Students should not expect that they will necessarily meet the lower division requirements at specific colleges or universities. Students should consult the Transfer Information section of this catalog for specific transfer information.

## BUSINESS APPLICATION DEVELOPMENT

Designed to provide a good foundation for students who are interested in developing computer applications. Students may choose courses in a number of areas to develop a general understanding of the field or they may choose to study a particular specialization or two in greater depth. In today's dynamic and changing technological environment, continuous professional upgrading is a requirement.

**Program Outcome**

Students will be prepared for employment in entry-level positions in the computer and information systems industries.

**CERTIFICATE OF ACHIEVEMENT**

**CORE CURRICULUM**

**Required Courses**

Course			Units
Financial Accounting	ACCT	A101	(4)
Intro to Computer Info Systems	CIS	A111	(3)
Intro to C# .NET Programming*	CS	A140	
(Or)			
Intro to VB .NET Programming*	CS	A142	(4)
(Or)			
Java Programming 1*	CS	A170	
Finite Math	MATH	A155	
(Or)			
Calculus 1	MATH	A180	
(Or)			(4)
Honors Calculus 1	MATH	A180H	
(Or)			
Calculus for BMSS	MATH	A140	

**Total: (15)**

*Courses marked by asterisk (\*) may not be used to satisfy both the core requirement and the specialization requirement.*

Students must complete the core curriculum plus 18 units from the following list of specialized application development courses. All courses do not need to be taken from the same area of specialization.

## INTRODUCTORY PROGRAMMING

Course			Units
Intro to C# .NET Programming*	CS	A140	(4)
Intro to VB .NET Programming*	CS	A142	(4)
Java Programming 1*	CS	A170	(4)

## TECHNICAL PROGRAMMING

Course			Units
Computer Architecture	CS	A116	(4)
C++ Programming 1	CS	A150	(4)
Windows .NET Programming	CS	A152	(4)
Data Structures	CS	A200	(4)
C++ Programming 2	CS	A250	(4)
Java Programming 2	CS	A272	(4)

## WEB DEVELOPMENT

Course			Units
Intro to Web Page Design	CIS	A123	(2)
Intro to Dreamweaver MX	CIS	A128	(2)
Cascading Style Sheets (CSS)	CIS	A129	(2)
Bus Multimedia/Graphics	CIS	A132	(2)
Flash Programming	CIS	A141	(3)
JavaScript Programming	CIS	A171	(2)
JavaScript 2	CIS	A223	(3)
Digital Photo Premiere	CIS	A232	(3)

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## NETWORKING ENVIRONMENT

Course			Units
Intro to UNIX	CIS	A106	(4)
MS Windows	CIS/BUS	A107	(1)
PC Concepts A+Cert Prep	CIS	A110	(4)
SQL Server Administration	CIS	A176	(4)
SQL Server Design & Implementation	CIS	A177	(4)
Network & Comm Technologies	CIS	A191	(4)
Network Systems Admin	CIS	A192	(4)
Network Infrastructure Admin	CIS	A193	(3)
Network Directory Services Admin	CIS	A194	(3)
Network Security Design	CIS	A196	(4)

## DATABASE

Course			Units
SQL Tuning Workshop	CIS	A178	(2)
PL/SQL II	CIS	A179	(2)
Intro to Database Concepts	CIS	A182	(4)
Oracle SQL Programming	CIS	A183	(4)
Oracle PL/SQL Programming	CIS	A184	(3)
Oracle Forms & Reports Developer	CIS	A185	(4)
Oracle Database Admin I	CIS	A187	(4)
Oracle Database Admin II	CIS	A188	(3)

(25)

**Total:** (28-40)

### ASSOCIATE DEGREES

Complete the Certificate of Achievement and the Associate in Science Graduation Requirements as outlined in the Graduation Requirements section of the catalog.

## COMPUTER PROGRAMMING

This certificate is designed to provide the student with comprehensive grounding in the theory and practice of modern computer programming. Based on the recommendations of the Association of Computing Machinery, the Computer Programming Certificate prepares students to work as entry-level programmers. Students should not expect that they will necessarily meet the lower division requirements at specific colleges or universities. Students should consult the Transfer Information section of this catalog for specific transfer information.

### Program Outcome

Based on the recommendations of the Association for Computing Machinery, The Computer Programming Certificate prepares students to work as entry-level programmers, or used to fulfill some of the requirements for transfer to a Computer Science program at a four-year university.

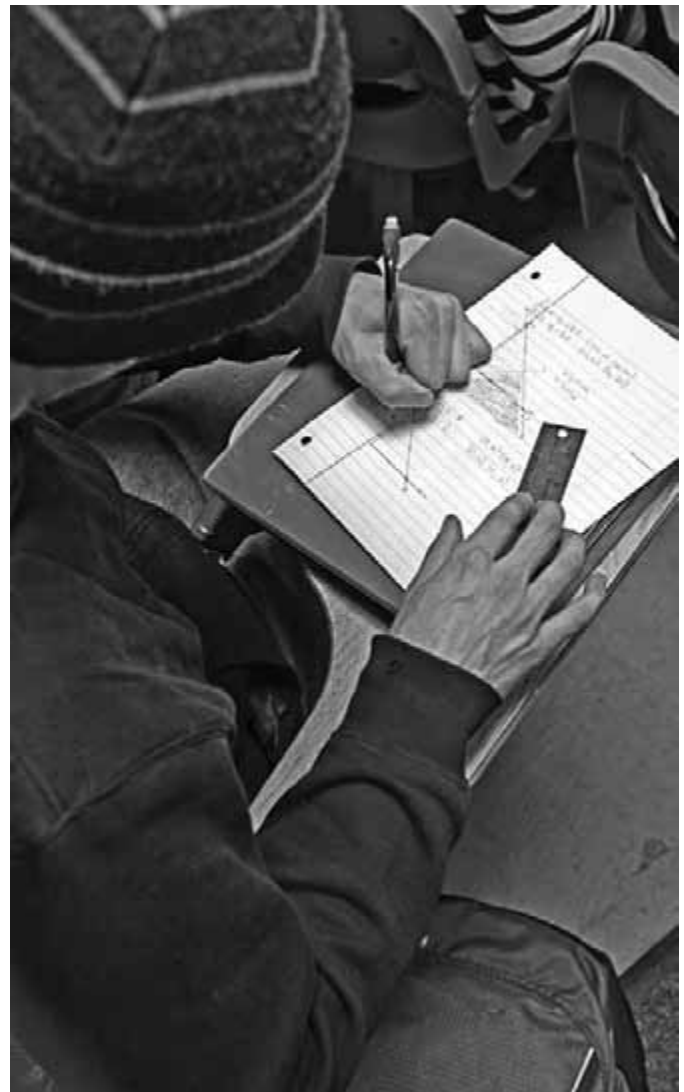
### CERTIFICATE OF ACHIEVEMENT

## COMPUTER SCIENCE

### Required Courses

Courses			Units
Computer Architecture	CS	A116	(4)
C++ Programming 1	CS	A150	(4)
Java Programming I	CS	A170	(4)
Data Structures	CS	A200	(4)
Software Engineering	CS	A220	(4)
C++ Programming 2	CS	A250	(4)
Theories of Computation	CS	A265	(1)

**Total:** (25)



## MATHEMATIC COURSES

Intro to Stats (or Honors Intro Stats)	MATH	A160(H)	(3)
(And) Calculus 1 (or Honors Calculus 1)	MATH	A180(H)	(8)
(Or)			
Calculus 2 (or Honors Calculus 2)	MATH	A185(H)	(4)
(Or)			
Honors Calculus 1 and 2	MATH	A182H	(5)
Intro to Discrete Mathematics	MATH	A230	(5)
Applied Linear Algebra	MATH	A235	(3)
(Or)			
Intro to Linear Algebra & Differential Equations	MATH	A285	(4)
(Or)			
Honors Intro to Linear Algebra & Differential Equations	MATH	A285H	(5)
		<b>Subtotal</b>	<b>(16-21)</b>
		<b>Total:</b>	<b>(41-46)</b>

### ASSOCIATE DEGREES

Complete the Certificate of Achievement and the Associate in Science Graduation Requirements as outlined in the Graduation Requirements section of the catalog.

## COMPUTER INFORMATION SYSTEMS

This program will meet major requirements for the Associate in Science degree but has not been articulated with any particular four-year institution. Students should not expect that they will necessarily meet the lower-division requirements at specific colleges or universities. Students should consult a counselor for specific transfer information.

This option provides the student with the lower-division transfer courses for some of the business oriented majors. Students are advised to check course transferability with an Orange Coast College counselor prior to enrolling in CIS courses.

### Program Outcome

Students will be prepared for employment in entry-level positions in the computer and information systems industries.

### CERTIFICATE OF ACHIEVEMENT

#### Required Courses

Course			Units
Financial Accounting	ACCT	A101	(4)
Managerial Accounting	ACCT	A102	(4)
Business Law	BUS	A110	(3)
Intro to Computer Info Systems	CIS	A111	(3)
PASCAL Programming	CS	A115	(4)
(Or)			
Java Programming 1	CS	A170	

Intro to C# .NET Programming	CS	A140	(4)
(Or)			
Intro to VB .NET Programming	CS	A142	(3)
Macroeconomics	ECON	A175	(3)
Microeconomics	ECON	A170	(3)
Calculus for BMSS	MATH	A140	(4)
(Or)			
Calculus 1	MATH	A180	
		<b>Total:</b>	<b>(32)</b>

### ASSOCIATE DEGREES

Complete the Certificate of Achievement and the Associate in Science Graduation Requirements as outlined in the Graduation Requirements section of the catalog.

## INFORMATION AND COMMUNICATIONS TECHNOLOGIES

Completion of this certificate will enable students to acquire the skill needed by professionals in information and communication technologies to support the converged network that carries voice, data, image, and video traffic. This career is an emerging IT-related career that sees high demand and growth.

### Program Outcomes

Students who receive the Information and Communications Technologies Certificate of Specialization will be able to design and implement a converged network.

### CERTIFICATE OF SPECIALIZATION

#### Required Courses

Courses			Units
PC Concepts: A+ Certification Prep	CIS	A110	(4)
Networking Essentials	CIS	A197	(4)
Routing and Router Configurations	CIS	A198	(3)
Convergence Technologies	CIS	A260	(3)
<b>Select 1 course from the following</b>			
Fundamentals of Wireless Networking	CIS	A 261	(3)
Fundamentals of Voice over IP	CIS	A262	(3)
Home Technology Integration	CIS	A263	(3)
Enterprise Router Configurations 1	CIS	A265	(3)
Enterprise Router Configurations 2	CIS	A266	(3)
LAN Switching and Wireless	CIS	A267	(3)
Accessing the WAN	CIS	A268	(3)
Information and Storage Management	CIS	A280	(3)
Ethical Hacking and Network Defense	CIS	A282	(3)
Small / Home Office: Case Study I	CIS	A290	(3)
		<b>Total:</b>	<b>(17)</b>

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## COMPUTER INFORMATION SYSTEMS

### CERTIFICATE OF SPECIALIZATION

## C ++ PROGRAMMING

Completion of this certificate, issued through the Business and Computing Division, will enable students to apply for entry-level positions in C++ programming. A grade of "C" or better is required in all courses. All courses must be completed at Orange Coast College.

### Program Outcome

Program completers will be able to write programs in C++ using classes, flow-of-control and fundamental data structure.

### Required Courses

Course			Units
C++ Programming 1	CS	A150	(4)
Data Structures	CS	A200	(4)
C++ Programming 2	CS	A250	(4)
<b>Total:</b>			<b>(12)</b>

## DATABASE ADMINISTRATION (ORACLE)

Completion of this certificate, issued through the Business and Computing Division, will enable students to acquire the skills needed for a career in Oracle database administration. In addition, this certificate provides preparation for students seeking Oracle's certification in Database Administration. To receive a certificate, students must complete at least 15 units of coursework with grade of "C" or better. All courses must be completed at Orange Coast College.

### Program Outcomes

Students will be able to:

1. Design and develop a data Model.
2. Create, manage, backup and recover an Oracle database.
3. Monitor database performance using Oracle-supplied administration tools and SQL.

### Required Courses

Course			Units
Intro to Database Concepts	CIS	A182	(4)
Oracle Database Admin I	CIS	A187	(4)
Oracle Database Admin II	CIS	A188	(3)

And minimum of 4 units from the following optional courses:

Course			Units
Introduction to Unix			
Oracle SQL Programming	CIS	A183	(4)
Oracle PL/SQL Programming	CIS	A184	(3)
SQL Tuning	CIS	A178	(2)
PL/SQL II	CIS	A179	(2)
	CIS	A106	(4)

**Total: (15)**

## DATABASE DEVELOPER (ORACLE)

Completion of this certificate, issued through the Business and Computing Division, will enable students to acquire the skills needed to pursue a career in PL/SQL Oracle database environment. In addition, this certificate provides preparation for students seeking Oracle's PL/SQL or Forms Developer certification. To receive the certificate, students must complete at least 15 units of coursework with a grade of "C" or better. All courses must be completed at Orange Coast College.

### Program Outcomes

Students will be able to:

1. Design and develop a data model.
2. Use SQL to retrieve data, manipulate and manage database objects.
3. Create, execute and maintain PL/SQL modules.

### Required Courses

Course			Units
Intro to Database Concepts	CIS	A182	(4)
Oracle SQL Programming	CIS	A183	(4)
Oracle PL/SQL Programming	CIS	A184	(3)

And a minimum of 4 units from the following optional courses:

Course			Units
Oracle Forms & Reports Developer	CIS	A185	(4)
SQL Tuning	CIS	A178	(2)
PL/SQL II	CIS	A179	(2)
Database Administration I	CIS	A187	(4)

**Total: (15)**

## NETWORK ADMINISTRATION AND OPERATIONS

Completion of this certificate will enable students to acquire the skills needed in the areas of technical operations and network management. In addition, this certificate provides preparation for students seeking industry-standard certification from CompTIA and Microsoft. A grade of "C" or better is required in all courses. All courses must be completed at Orange Coast College.

**Program Outcome**

Students who receive the Convergence Technologies Certificate of Specialization will be able to design and implement a small to medium network environment.

**Required Courses**

<b>Course</b>			<b>Units</b>
PC Concepts: A+Cert Prep	CIS	A110	(4)
Network & Comm Technologies	CIS	A191	(4)
Network Systems Admin	CIS	A192	(4)
<b>Select one (1) course from the following:</b>			
SQL Server Administration	CIS	A176	(4)
SQL Server Design & Implementation	CIS	A177	(4)
Network Infrastructure Admin	CIS	A193	(3)
Network Directory Services Admin	CIS	A194	(3)
Network Security Design	CIS	A196	(4)
<b>Total:</b>			<b>(15-16)</b>

**Required Courses**

<b>Course</b>			<b>Units</b>
Intro to Web Page Design	CIS	A123	(2)
Intro to Dreamweaver	CIS	A128	(2)
Cascading Style Sheets/Web Pgs	CIS	A129	(2)
Bus Multimedia/Graphics	CIS	A132	(2)
Flash Programming	CIS	A141	(3)
JavaScript 1	CIS	A171	(2)
JavaScript 2	CIS	A223	(2)
<b>Total:</b>			<b>(10-11)</b>

**OFFICE APPLICATIONS**

Completion of this certificate, issued through the Business and Computing Division, will enable students to apply for office personnel positions using Microsoft Office applications. A grade of "C" or better is required in all courses. All courses must be completed at Orange Coast College.

**Program Outcomes**

Students who receive the Office Applications Certificate of Specialization will be able to:

1. Use a computer operating system and computer applications for word processing, electronic spreadsheet creation, database management, multimedia presentations, and electronic personal management with competence.
2. Achieve personal development and responsibility for entering the job market.

**Required Courses**

<b>Course</b>			<b>Units</b>
Beginning Computer Keyboarding 1	CIS	A090	(1.5)
Beginning Computer Keyboarding 2	CIS	A092	(1.5)
Introduction to Computer Applications	CIS	A100	(3)
Excel 1	CIS/BUS	A134	(2)
<b>Total:</b>			<b>(8)</b>

**WEB DESIGN**

**Program Outcome**

Completion of this certificate, issued through the Business and Computing Division, will enable students to apply for entry-level positions in designing for the World Wide Web. A grade of "C" or better is required in all courses. As an added outcome, Web Design Certificate students will be able to create dynamic Web pages.

**Complete five (5) courses from this list (must be taken at Orange Coast College.)**

**CONSTRUCTION TECHNOLOGY**

The Construction Technology program has courses that can be divided into two major areas of emphasis: Residential Trades and Construction Management. Due to the vast diversity of occupations and areas of specialization within the construction industry and recognizing that individual student needs will be as diverse, a Certificate of Achievement can be designed that satisfies those specific needs. Completion of a certificate program satisfies the major requirement for the Associate in Science degree. Certificates of Achievement and Specialization can be completed in one to two semesters.

**Program Outcome**

Upon successful completion of the Construction Specialist program, students will have the knowledge, skills and experience to identify, assess, and participate in many entry-level construction trades. Students successfully completing a comprehensive series of courses will be prepared to work in the construction field in positions including, but not limited to work areas such as inspection, management, and as hands-on skilled trades people.

**CONSTRUCTION TECHNOLOGY**

Construction Technology A165, Construction Safety/CAL-OSHA, is required for any first earned Certificate of Achievement. It is recommended that all beginning, full-time students enroll in the following courses leading to a Certificate of Achievement.

**CERTIFICATE OF ACHIEVEMENT**

**Required Courses**

<b>Course</b>			<b>Units</b>
Construction Safety/CAL-OSHA	CNST	A165	(3)
Building Construction	CNST	A180	(5)
Building Construction	CNST	A185	(5)
Blueprint Reading & Drafting	CNST	A190	(4)
Building Code & Law	CNST	A195	(3)
Specialty Crafts	CNST	A240	(5)
<b>Total:</b>			<b>(25)</b>

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