

# Associate Degree Programs and Certificates



**Cuyamaca  
College**



*& Growing*

## ASSOCIATE DEGREE PROGRAMS & CERTIFICATES

Program	Associate Degree	Certificate of Achievement	Certificate of Proficiency	Program	Associate Degree	Certificate of Achievement	Certificate of Proficiency
ACCOUNTING				ELEMENTARY EDUCATION	◆		
Accounting	◆	◆		ENGINEERING			
Bookkeeping		◆		Civil Engineering	◆	◆	
ART				Electrical & Computer Engineering	◆	◆	
Drawing and Painting	◆			Mechanical & Aerospace Engineering	◆	◆	
Graphic Design (Transfer)	◆			ENGLISH	◆	◆	
AUTOMOTIVE TECHNOLOGY	◆	◆		ENTREPRENEURSHIP-SMALL BUSINESS MANAGEMENT	◆	◆	
Advanced Engine Performance and Emissions		◆		ENVIRONMENTAL HEALTH AND SAFETY TECHNOLOGY			
ASEP	◆			Environmental Management	◆		
ASSET	◆			Environmental Technician		◆	
Brakes and Front-End		◆		Occupational Safety and Health (OSH) Management	◆		
Engine Performance and Drive Train		◆		Occupational Safety and Health (OSH) Technician		◆	
BIOLOGICAL SCIENCES	◆			EXERCISE SCIENCE	◆		
BUSINESS				Recreational Leadership-School-Based Programs			◆
Business Administration	◆	◆		GENERAL MAJOR	◆		
Business Data Management	◆	◆		GRAPHIC DESIGN	◆	◆	
Business-General	◆	◆		Digital Photography			◆
Database Administration			◆	Web Graphics			◆
BUSINESS OFFICE TECHNOLOGY	◆	◆		HISTORY	◆		
Administrative Assistant	◆	◆		MANAGEMENT	◆	◆	
Executive Assistant	◆	◆		MATHEMATICS	◆	◆	
Office Assistant Level I			◆	MUSIC EDUCATION	◆		
Office Assistant Level II			◆	ORNAMENTAL HORTICULTURE			
Office Professional			◆	Arboriculture	◆	◆	
Office Software Specialist Level I			◆	Floristry	◆	◆	
Office Software Specialist Level II			◆	Golf Course and Sports Turf Management	◆	◆	
CADD TECHNOLOGY				Irrigation Technology	◆	◆	
Building Design Industry	◆	◆		Landscape Design	◆	◆	
Manufacturing Industry	◆	◆		Landscape Technology	◆	◆	
CHEMISTRY	◆			Nursery Technology	◆	◆	
CHILD DEVELOPMENT				PARALEGAL STUDIES	◆		
Infants and Toddlers	◆	◆		PHYSICAL SCIENCE	◆		
Preschool Children	◆	◆		PHYSICS	◆		
School Age Child Care	◆	◆		REAL ESTATE	◆	◆	
Early Childhood Intervention			◆	Escrow		◆	
Recreational Leadership-Outdoor Programs			◆	SOCIAL WORK	◆		
COMMUNICATION	◆			SPANISH	◆	◆	
COMPUTATIONAL SCIENCE	◆	◆		SURVEYING	◆	◆	
COMPUTER AND INFORMATION SCIENCE				UNIVERSITY TRANSFER STUDIES	◆		
Computer Network Administration	◆	◆		WATER/WASTEWATER TECHNOLOGY			
Telecommunications Networking Technology	◆			Cross Connection Control Systems	◆	◆	
Telecommunications Networking Technician		◆		Water Distribution Systems	◆	◆	
Web Development	◆	◆		Water Treatment Plant Operator	◆	◆	
Cisco Systems			◆	Wastewater Collection Systems	◆	◆	
Computer Programming			◆	Wastewater Treatment Operator	◆	◆	
Network Servicing Technology			◆				
Operating Systems			◆				
Telecommunications Servicing Technology			◆				
Web Design			◆				
Web Programming			◆				
Web Server Management			◆				

**NOTE:** Course choices for transfer and the Associate Degree may differ between Cuyamaca and Grossmont Colleges. Each college strongly recommends that students visit the Counseling Centers for specific information if they plan to attend both campuses.

## ACCOUNTING (Major Code: 50020)

This degree program is designed to prepare students to enter the workforce as accounting technicians or tax technicians. The curriculum is supported by related business courses and a strong general education program for students interested in qualifying for responsible positions in accounting. **Designed for a two-year degree or certificate only. Students interested in pursuing a bachelor's degree in accounting should consult the catalog of the transfer institution for specific requirements.**

### CAREER OPPORTUNITIES

- \*Auditor
- \*Budgeter
- \*Bank Examiner
- Bookkeeper
- \*Cost Accountant
- \*Certified Accountant
- \*Controller
- Credit Card Clerk
- Securities Clerk
- \*Systems Analyst
- \*Tax Specialist/Accountant
- \*Treasurer

\*Bachelor Degree or higher required

### Associate in Science Degree Requirements:

<i>Course</i>	<i>Title</i>	<i>Units</i>
BUS 120	Financial Accounting	4
BUS 121	Managerial Accounting	4
BUS 122	Intermediate Accounting	4
BUS 124	Auditing	3
BUS 125	Business Law: Legal Environment of Business	3
BUS 128	Business Communication	3
BUS 150	Individual Income Tax Accounting	3
BUS 162	Analysis of Financial Statements	3
BUS 176	Computerized Accounting Applications	2
CIS 110	Principles of Information Systems	4
	Total Required	33
	Plus General Education Requirements	

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Accounting. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

### BOOKKEEPING CERTIFICATE (Major Code: 50024)

This certificate is for students who need very specific training in the area of bookkeeping/accounting, either to obtain the necessary skills for an entry level office position, or to provide technical competence for advancement within the office environment. The certificate does not require completion of the "core" curriculum; it may be completed during two semesters of concentrated study.

### Certificate Requirements:

<i>Course</i>	<i>Title</i>	<i>Units</i>
BOT 123-125	Comprehensive Excel Levels I-III	3
BUS 109	Elementary Accounting	3
<b>or</b>		
BUS 120	Financial Accounting	4
BUS 121	Managerial Accounting	4
BUS 128	Business Communication	3
BUS 129	Payroll Accounting and Business Taxes	2
BUS 176	Computerized Accounting Applications	2
CIS 105	Introduction to Computing	3
	Total Required	20-21

NOTE: BUS 109 may be taken instead of BUS 120 for the Bookkeeping Certificate only.

### Certificate of Achievement

Students who complete the requirements above qualify for a Certificate in Bookkeeping. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.



# ART

## I. ART–DRAWING AND PAINTING (Major Code: 53044)

This degree program is designed to provide a fundamental background in the two-dimensional studio arts, emphasizing both technique and aesthetic awareness. Students will develop their ability to control line, value, shape, color, perspective and composition in various mediums. The major provides preparation for transfer to a four-year college in fine art or a vocational area related to art. The curriculum consists of courses in both studio techniques and art history.

### CAREER OPPORTUNITIES

- \*Advertising Specialist
- Antique Dealer
- \*Art Conservator
- \*Art Therapist
- Arts Administration
- Cartoonist
- \*Curator
- Display Manager
- \*Fashion Designer
- Gallery Owner
- Illustrator
- Independent Artist
- \*Interior Design
- Jewelry Designer
- Museum Technician
- Painter
- Police Artist
- Set Designer
- \*Teacher/Professor

\*Bachelor Degree or higher required

### Associate in Arts Degree Requirements:

Course	Title	Units
ART 120	Two-Dimensional Design	3
ART 121	Painting I	3
ART 124	Drawing I	3
ART 125	Drawing II	3
ART 140	History of Western Art I: Prehistoric to 1250 A.D.	3
ART 141	History of Western Art II: 1250 A.D. to Present Time	3
ART 230	Figure Drawing I	3
GD 105	Fundamentals of Digital Media	3
		24

### Select six (6) units from the following:

ART 129*	Three-Dimensional Design	3
ART 135	Watercolor I	3
ART 145	Contemporary Art History: 1945-Present	3
ART 220	Painting II	3
ART 231	Figure Drawing II	3
GD 126ABCD	Photoshop Digital Imaging	3
GD 225	Digital Illustration	3
		6
Total Required		30
Plus General Education Requirements		

### Recommended Electives:

FREN 120, HIST 105, HUM 155, RELG 120

\*Offered at Grossmont College

## II. ART–GRAPHIC DESIGN (Transfer)

(Major Code: 53050)

This degree program emphasizes aesthetics, design and craft using manual and digital mediums. Students will develop their ability to think spatially in two and three dimensions and to use creative problem-solving techniques using images and letter forms. Students will develop a professional portfolio for placement at a four-year university.

**Designed for students interested in pursuing a Bachelor's degree in Graphic Design. Students should consult the catalog of the transfer institution for specific requirements. Students interested in pursuing the entry level, two-year associate degree or certificate in Graphic Design should refer to the "Graphic Design" program.**

### CAREER OPPORTUNITIES

- \*Advertising Director
- Advertising
- \*Art Director
- Desktop Publishing
- Display Designer
- Graphic Designer
- Illustrator
- \*Marketing Director
- Multimedia
- Package Designer
- Web Page Designer

\*Bachelor Degree or higher required

### Associate in Arts Degree Requirements:

Course	Title	Units
ART 120	Two-Dimensional Design	3
ART 121	Painting I	3
ART 124	Drawing I	3
ART 125	Drawing II	3
ART 129*	Three-Dimensional Design	3
ART 140	History of Western Art I: Prehistoric to 1250 A.D.	3
ART 141	History of Western Art II: 1250 A.D. to Present Time	3
ART 230	Figure Drawing I	3
GD 105	Fundamentals of Digital Media	3
GD 110	Graphic Design Principles	3
GD 125	Typography	3
Total Required		33
Plus General Education Requirements		

### Recommended Electives:

ART 150\*, BUS 110, GD 230

\*Offered at Grossmont College

## AUTOMOTIVE TECHNOLOGY

The automotive technology curriculum provides for entry level skills in the automotive field. The program is designed to impart in-depth technical skills as required in today's highly technical automotive field. Preparation for employment in the automotive and/or transportation trades, with upgrading and specialization skills for those currently employed will be stressed. Emphasizes practical experience in actual repairs under simulated shop conditions.

### CAREER OPPORTUNITIES

Auto Electrician  
 Auto Parts Salesperson  
 Automotive Air Conditioning Technician  
 Brake and Front-End Technician  
 Computerized Engine Control Specialist  
 Engine Machinist  
 General Repair Technician  
 High Performance and Racing Specialist  
 Licensed Smog Technician  
 Manufacturer Service Engineer  
 Service Advisor  
 Service Manager  
 Technical Instructor  
 Technical Sales Representative  
 Transmission Technician  
 Tune-up Technician

### I. AUTOMOTIVE TECHNOLOGY (Major Code: 51000)

#### Associate in Science Degree Requirements:

Course	Title	Units
AUTO 120	Engine Performance I - Mechanical and Ignition Systems	5
AUTO 121	Emission Control License	5
AUTO 122	Automotive Electrical Systems	5
AUTO 123	Engine Performance II - Fuel Systems	5
AUTO 124	Engine Performance III - Drivability	5
AUTO 180	Automotive Service Advisor	1
AUTO 182	Automotive Work Experience	3
		<u>29</u>

#### Select two (2) of the following:

AUTO 129	Introduction to Alternative Fuels	3.5
AUTO 130	Automotive Brakes and Brake License	5
AUTO 140	Four-Wheel Alignment	5
AUTO 152	Drive Train Systems	4
AUTO 160	Air Conditioning and Heating Systems	3
AUTO 170	Engine Overhaul	5
		<u>6.5-10</u>

#### Select one (1) of the following:

AUTO 127	Advanced Automotive Electrical Systems	5
AUTO 135	Advanced Brakes	5
AUTO 145	Advanced Four-Wheel Alignment	5
AUTO 155	Advanced Drive Train Systems	4
AUTO 165	Advanced Air Conditioning and Heating Systems	3
AUTO 175	Advanced Engine Overhaul	5
AUTO 176	Engine Machining	5
		<u>3-5</u>
	Total Required	38.5-44
	Plus General Education Requirements	

FOR ALL CLASSES: Students are required to provide their own hand tools as required. Students are also required to provide ANSI Z-87.1 (1979) eye protection.

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Automotive Technology. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

### II. AUTOMOTIVE TECHNOLOGY-ADVANCED ENGINE PERFORMANCE AND EMISSIONS

(Major Code: 51006)

#### Certificate Requirements:

Course	Title	Units
AUTO 120	Engine Performance I - Mechanical and Ignition Systems	5
AUTO 121	Emission Control License	5
AUTO 122	Automotive Electrical Systems	5
AUTO 123	Engine Performance II - Fuel Systems	5
AUTO 124	Engine Performance III - Drivability	5
	Total Required	<u>25</u>

### Certificate of Achievement

Students who complete the requirements above qualify for a Certificate in Automotive Technology-Advanced Engine Performance and Emissions. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

### III. AUTOMOTIVE TECHNOLOGY-ASEP

(Major Code: 51007)

The General Motors sponsored ASEP degree program offers a unique job training opportunity to those students who are accepted. Training includes all systems of the sponsoring manufacturers' automobiles. In addition, students will be required to further their studies in a sponsoring dealership as a paid (work experience) technician. Not offered as a certificate; all students must complete the general education requirements in addition to the requirements listed below. Candidates who successfully complete these requirements will be granted an Associate Degree.

#### NOTE:

- Grade point average of "C" (2.0) is required for the major.
- Students who test low in English, reading or math assessment scores (and are accepted into the program) will be required to take remedial courses in those areas in addition to the general education courses.
- Students who have previous college credit or an Associate Degree or higher may be exempt from all or part of the general education requirements. (Students should request an appointment with a counselor to have their General Education requirements evaluated.)

**Associate in Science Degree Requirements:**

Course	Title	Units
AUTO 121	Emission Control License	5
AUTO 200	ASEP–Orientation	1
AUTO 201	ASEP–Electrical	6
AUTO 202	ASEP–Brakes and Alignment	7
AUTO 203	ASEP–Engine Repair	4.5
AUTO 204	ASEP–Power Train	7
AUTO 205	ASEP–Engine Performance and Air Conditioning	7
		<u>37.5</u>

**Work Experience:**

AUTO 206*	ASEP–Work Experience	15
	Total Required	<u>52.5</u>
	Plus General Education Requirements	

\*Must be repeated 5 times for a total of 15 units

**IV. AUTOMOTIVE TECHNOLOGY–ASSET**

(Major Code: 51005)

The Ford sponsored ASSET degree program offers a unique job training opportunity to those students who are accepted. Training includes all systems of the sponsoring manufacturers' automobiles. In addition, students will be required to further their studies in a sponsoring dealership as a paid (work experience) technician. Not offered as a certificate; all students must complete the general education requirements in addition to the requirements listed below. Candidates who successfully complete these requirements will be granted an Associate Degree.

**NOTE:**

- Grade point average of "C" (2.0) is required for the major.
- Students who test low in English, reading or math assessment scores (and are accepted into the program) will be required to take remedial courses in those areas in addition to the general education courses.
- Students who have previous college credit or an Associate Degree or higher may be exempt from all or part of the general education requirements. (Students should request an appointment with a counselor to have their General Education requirements evaluated.)

**Associate in Science Degree Requirements:**

Course	Title	Units
AUTO 121	Emission Control License	5
AUTO 190	ASSET–Orientation, PDI and Lubrication	2
AUTO 191	ASSET–Brakes and Alignment	7
AUTO 192	ASSET–Drive Train	8
AUTO 193	ASSET–Engine Repair	4.5
AUTO 195	ASSET–Electronic Engine Controls	7
AUTO 196	ASSET–Electrical, Accessories and Air Conditioning	5
		<u>38.5</u>

**Work Experience:**

AUTO 197*	ASSET–Work Experience	13
	Total Required	<u>51.5</u>
	Plus General Education Requirements	

\*Must be repeated 5 times for a total of 13 units

**V. AUTOMOTIVE TECHNOLOGY–  
BRAKES AND FRONT-END (Major Code: 51003)****Certificate Requirements:**

Course	Title	Units
AUTO 130	Automotive Brakes and Brake License	5
AUTO 140	Four-Wheel Alignment	5
AUTO 145	Advanced Four-Wheel Alignment	5
AUTO 180	Automotive Service Advisor	1
AUTO 182	Automotive Work Experience	3
	Total Required	<u>19</u>

**Certificate of Achievement**

Students who complete the requirements above qualify for a Certificate in Automotive Technology–Brakes and Front-End. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**VI. AUTOMOTIVE TECHNOLOGY–ENGINE  
PERFORMANCE AND DRIVE TRAIN**

(Major Code: 51002)

**Certificate Requirements:**

Course	Title	Units
AUTO 120	Engine Performance I - Mechanical and Ignition Systems	5
AUTO 152	Drive Train Systems	4
AUTO 170	Engine Overhaul	5
AUTO 180	Automotive Service Advisor	1
AUTO 182	Automotive Work Experience	3
	Total Required	<u>18</u>

**Certificate of Achievement**

Students who complete the requirements above qualify for a Certificate in Automotive Technology–Engine Performance and Drive Train. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## BIOLOGICAL SCIENCES

(Major Code: 59500)

This degree program is designed to provide a two-year transfer program with emphasis on the uniformity and diversity of life. The major fulfills the lower division requirements for majors in biology, dentistry, medicine, nursing, pharmacy, environmental health, microbiology and ecology.

### CAREER OPPORTUNITIES

- \*Aquatic Biologist
- \*Athletic Trainer
- \*Biologist
- \*Biochemical Engineer
- Biological Technician
- Biomedical Equipment Technician
- Biotechnologist
- \*Botanist
- Clinical Lab Technologist
- \*Cytologist
- \*Ecologist
- \*Environmental Engineer
- Environmental Technician
- \*Environmental Microbiologist
- Genetic Engineering Technician
- Greenhouse Assistant
- Laboratory Technician
- \*Physical Therapist
- \*Public Health Biologist
- Purification Technician
- Research Assistant
- Safety Specialist
- \*Teacher
- Technical Writer
- Waste Management Technician

\*Bachelor Degree or higher required

### Associate in Science Degree Requirements:

<i>Course</i>	<i>Title</i>	<i>Units</i>
BIO 210	Biology II	4
BIO 215	Statistics for Life Sciences	3
BIO 220	Principles of Molecular, Cellular and Evolutionary Biology	3
BIO 221	Principles of Molecular, Cellular and Evolutionary Biology Laboratory	1
CHEM 141	General Chemistry I	5
CHEM 142	General Chemistry II	5
CHEM 231	Organic Chemistry I	5
MATH 180	Analytic Geometry and Calculus I	5
PHYC 130	Fundamentals of Physics	4
PHYC 131	Fundamentals of Physics	4
	Total Required	39
	Plus General Education Requirements	

## BUSINESS

### I. BUSINESS ADMINISTRATION (Major Code: 50041)

This degree program is designed to give students who choose to work toward a bachelor's degree a well-balanced introduction to a professional career in business. Fulfills the lower division requirements for most majors in the School of Business Administration at San Diego State University and is typical of requirements at other four-year schools. For specific requirements, transfer students should consult the catalog of their selected institution.

### CAREER OPPORTUNITIES

- \*Advertising/Marketing Manager
- \*Agricultural Marketing Specialist
- \*Banker
- \*Broker
- Consultant
- \*Computer Operations Specialist
- Credit Investigator
- \*Economic Forecaster
- \*Financial Analyst
- \*Hospital Administrator
- Import/Export Agent
- \*Market Research Analyst
- \*Personnel Manager
- Real Estate Broker/Agent
- Retail Manager
- \*Securities Analyst/Trader

\*Bachelor Degree or higher required

### Associate in Science Degree Requirements:

<i>Course</i>	<i>Title</i>	<i>Units</i>
BUS 120	Financial Accounting	4
BUS 121	Managerial Accounting	4
BUS 125	Business Law: Legal Environment of Business	3
BUS 128	Business Communication	3
CIS 110	Principles of Information Systems	4
ECON 120	Principles of Macroeconomics	3
ECON 121	Principles of Microeconomics	3
MATH 160	Elementary Statistics	3
MATH 178	Calculus for Business, Social and Behavioral Sciences	4
	Total Required	31
	Plus General Education Requirements	

### Recommended Electives:

BUS 146, 156

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Business Administration. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**II. BUSINESS–GENERAL (Major Code: 50010)**

This degree program is designed to develop and foster those skills and understandings which can be utilized for employment in an increasingly challenging business environment. Provides students with a broad preparation for a career in business. Business courses are included which provide a solid background for future promotion in a chosen occupational area. Designed for students who do not plan to transfer to a four-year college or university.

**CAREER OPPORTUNITIES**

- Administrative Assistant
- Bookkeeper
- \*Budget Consultant
- Buyer
- Conciliator
- \*Credit Analyst
- Employment Interviewer
- \*Hospital Administrator
- Sales Agent
- \*Trust Officer

\*Bachelor Degree or higher required

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
BUS 109	Elementary Accounting	3
<b>or</b>		
BUS 120	Financial Accounting	4
BUS 110	Introduction to Business	3
BUS 115	Human Relations in Business	3
BUS 125	Business Law: Legal Environment of Business	3
BOT 110*	Business English and Communication	3
<b>or</b>		
BUS 128	Business Communication	3
BUS 146	Marketing	3
BUS 152	Business Mathematics	2
BUS 195	Family Income Management	3
CIS 105	Introduction to Computing	3
<b>or</b>		
CIS 110	Principles of Information Systems	4
ECON 120	Principles of Macroeconomics	3
	Total Required	29-31
	Plus General Education Requirements	

\*Offered at Grossmont College

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Business–General. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**III. BUSINESS DATA MANAGEMENT**

(Major Code: 50016)

This program prepares students for careers in business using information technology to organize and promote advanced business management policies. Students can also complete classes in preparation for the Microsoft Certified Database Administrator exams.

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
BUS 128	Business Communication	3
BUS 240	SQL for Business Applications	3
BUS 242	Data Mining	3
CIS 110	Principles of Information Systems	4
CIS 140	Databases	3
CIS 190	Windows Operating System	3
CIS 240	Advanced Databases	3
CIS 242	Database Design	3
		25

**Select one (1) from the following:**

COMM 120	Interpersonal Communication	3
COMM 122	Public Speaking	3
		3

**Select one (1) from the following:**

CIS 216	Active Server Pages	3
CIS 290	Windows System Administration	3
CS 180ABCD	Introduction to Visual Basic Programming	4
		3-4
	Total Required	31-32
	Plus General Education Requirements	

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Business Data Management. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**CERTIFICATE OF PROFICIENCY:**

**DATABASE ADMINISTRATION (Major Code: 57127)**

**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
BUS 240	SQL for Business Applications	3
BUS 242	Data Mining	3
CIS 140	Databases	3
CIS 240	Advanced Databases	3
CIS 242	Database Design	3
	Total Required	15

Students who complete the requirements above qualify for a Certificate of Proficiency in Database Administration. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.



## BUSINESS OFFICE TECHNOLOGY

### I. BUSINESS OFFICE TECHNOLOGY (Major Code: 59501)

This degree program prepares students for employment in today's business offices which are technology intensive. The curriculum is also appropriate for those wishing to update current skills. Emphasis is on the computerized office and development into supervisory positions.

#### CAREER OPPORTUNITIES

Account Clerk  
 Administrative Assistant  
 Bank Teller  
 Billing Clerk  
 Bookkeeper  
 Brokerage Clerk  
 Computer Operator  
 Court Clerk  
 Customer Service Representative  
 Executive Assistant  
 Executive Secretary  
 File Clerk  
 General Office Clerk  
 Hotel/Motel Desk Clerk  
 Information Clerk  
 Insurance Clerk  
 Legal Secretary  
 Loan/Credit Clerk  
 Medical Secretary  
 Office Manager  
 Personnel Clerk  
 Real Estate Clerk  
 Secretary  
 Word Processing Specialist

#### Associate in Science Degree Requirements:

Course	Title	Units
BOT 100	Basic Keyboarding	1
BOT 101AB	Keyboarding/Document Processing	3
BOT 102AB	Intermediate Keyboarding/Document Processing I-II	3
BOT 107	Office Systems and Procedures	2
BOT 120-122	Comprehensive Word Levels I-III	3
BUS 128	Business Communication	3
CIS 105	Introduction to Computing	3
<b>or</b>		
CIS 110	Principles of Information Systems	4
		18-19

#### Select at least six (6) units from the following:

BOT 108	Using Calculators to Solve Business Problems	1
BOT 123-125	Comprehensive Excel Levels I-III	3
BUS 109	Elementary Accounting	3
<b>or</b>		
BUS 120	Financial Accounting	4
BUS 156	Principles of Management	3
BUS 157	Principles of Leadership	3
BUS 176	Computerized Accounting Applications	2
CIS 140	Databases	3
		6
Total Required		24-25
Plus General Education Requirements		

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Business Office Technology. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

### II. ADMINISTRATIVE ASSISTANT (Major Code: 50149)

#### Associate in Science Degree Requirements:

Course	Title	Units
BOT 102AB	Intermediate Keyboarding/Document Processing I-II	3
BOT 104	Filing and Records Management	1
BOT 107	Office Systems and Procedures	2
BOT 108	Using Calculators to Solve Business Problems	1
BOT 114	Essential Word	1
<b>or</b>		
BOT 120-122	Comprehensive Word Levels I-III	3
BOT 115	Essential Excel	1
<b>or</b>		
BOT 123-125	Comprehensive Excel Levels I-III	3
BOT 116	Essential Access	1
<b>or</b>		
BOT 126-128	Comprehensive Access Levels I-III	3
BOT 117	Essential PowerPoint	1
<b>or</b>		
BOT 129-131	Comprehensive PowerPoint Levels I-III	3
BOT 118	Integrated Office Projects	1
BOT 223-225	Office Work Experience	1-3
BUS 114	Effective Job Search	1
BUS 128	Business Communication	3
		17-27

#### Select at least three (3) units from the following:

BOT 103ABC	Building Keyboarding Skill I, II, III	.5
BOT 105	Data Entry Skills	1
BOT 150	Using Microsoft Publisher	1
BOT 151	Using Microsoft Outlook	1
BUS 109	Elementary Accounting	3
		3
Total Required		20-30
Plus General Education Requirements		

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Administrative Assistant. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**III. EXECUTIVE ASSISTANT (Major Code: 50150)**

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
BOT 120-122	Comprehensive Word Levels I-III	3
BOT 123-125	Comprehensive Excel Levels I-III	3
BOT 126-128	Comprehensive Access Levels I-III	3
<b>or</b>		
CIS 140	Databases	3
BOT 129-131	Comprehensive PowerPoint Levels I-III	3
BOT 151	Using Microsoft Outlook	1
BOT 201	Advanced Keyboarding/Document Processing	3
BOT 203	Office Project Coordination	1
BUS 128	Business Communication	3
		20

**Select at least three (3) units from the following:**

BUS 109	Elementary Accounting	3
BUS 110	Introduction to Business	3
BUS 115	Human Relations in Business	3
BUS 120	Financial Accounting	4
BUS 125	Business Law: Legal Environment of Business	3
		3

**Select at least three (3) units from the following:**

BOT 103ABC	Building Keyboarding Skill I, II, III	.5
BOT 150	Using Microsoft Publisher	1
BOT 280ABC	Preparing for Performance Examinations in Microsoft Word	.5
BOT 281ABC	Preparing for Performance Examinations in Microsoft Excel	.5
BOT 282ABC	Preparing for Performance Examinations in Microsoft Access	.5
BOT 283ABC	Preparing for Performance Examinations in Microsoft PowerPoint	.5
CIS 240	Advanced Databases	3
		3
	Total Required	26
	Plus General Education Requirements	

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Executive Assistant. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**CERTIFICATES OF PROFICIENCY:**

Students who complete the requirements below qualify for a Certificate of Proficiency in that area of emphasis. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**I. OFFICE ASSISTANT LEVEL I (Major Code: 57105)**

Prepares beginning students for work in positions that require keyboarding skills, basic knowledge of filing, and basic computer skills. Designed for students with no prior computer training and who lack general office background and experience. Upon completion of the certificate, students will qualify for positions as data entry clerks or other entry level office clerical positions.

**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
BOT 096	Computer Basics for the Office	1
BOT 097	Windows Basics for the Office	1
BOT 100	Basic Keyboarding	1
BOT 101AB	Keyboarding/Document Processing	3
BOT 104	Filing and Records Management	1
BOT 105	Data Entry Skills	1
BUS 114	Effective Job Search	1
	Total Required	9

**II. OFFICE ASSISTANT LEVEL II (Major Code: 57106)**

Designed for students who have completed the Office Assistant Level I certificate or have the equivalent in keyboarding and computer skills. Prepares students for advancement in office careers in which knowledge of Microsoft Office applications is required.

**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
BOT 102AB	Intermediate Keyboarding/Document Processing I-II	3
BOT 107	Office Systems and Procedures	2
BOT 114	Essential Word	1
BOT 115	Essential Excel	1
BOT 116	Essential Access	1
BOT 117	Essential PowerPoint	1
	Total Required	9

**III. OFFICE PROFESSIONAL (Major Code: 57104)**

Designed for entry-level positions in a broad spectrum of office environments. Utilizing a short-term, intensive format, students are provided with the basic skills necessary to be productive employees. The curriculum provides the foundation for further study and advancement in the clerical field, which is one of the largest employment areas in our information processing society.

**Certificate Requirements:**

Course	Title	Units
BOT 100	Basic Keyboarding	1
<b>or</b>		
BOT 101AB	Keyboarding/Document Processing	3
<b>or</b>		
BOT 102AB	Intermediate Keyboarding/Document Processing I-II	3
BOT 107	Office Systems and Procedures	2
BOT 114	Essential Word	1
BOT 115	Essential Excel	1
BOT 223	Office Work Experience	1
BUS 110	Introduction to Business	3
BUS 128	Business Communication	3
	Total Required	<u>12-14</u>

**IV. OFFICE SOFTWARE SPECIALIST LEVEL I**

(Major Code: 57107)

This certificate is designed for students who are interested in working in an administrative support capacity that need working knowledge of word processing, electronic spreadsheet, database and presentation software. These courses may also be applied to the Office Assistant Level II certificate of proficiency. *All courses must be completed with a grade of "C" or better.*

**Certificate Requirements:**

Course	Title	Units
BOT 100	Basic Keyboarding	1
BOT 114	Essential Word	1
<b>or</b>		
BOT 120-121	Comprehensive Word, Levels I-II	2
BOT 115	Essential Excel	1
<b>or</b>		
BOT 123-124	Comprehensive Excel, Levels I-II	2
BOT 116	Essential Access	1
<b>or</b>		
BOT 126-127	Comprehensive Access, Levels I-II	2
BOT 117	Essential PowerPoint	1
<b>or</b>		
BOT 129-130	Comprehensive PowerPoint, Levels I-II	<u>2</u>
	Total Required	<u>5-9</u>

**V. OFFICE SOFTWARE SPECIALIST LEVEL II**

(Major Code: 57108)

This certificate is designed for students who are interested in working in an administrative support capacity that need working knowledge of word processing, electronic spreadsheet, database and presentation software as well as software integration techniques. Students who complete the certificate may continue taking courses to earn the Executive Assistant Certificate of Achievement. *All courses must be completed with a grade of "C" or better.*

**Certificate Requirements:**

Course	Title	Units
BOT 100	Basic Keyboarding	1
BOT 118	Integrated Office Projects	1
BOT 120	Comprehensive Word, Level I	1
<b>or</b>		
BOT 114	Essential Word	1
BOT 121	Comprehensive Word, Level II	1
BOT 122	Comprehensive Word, Level III	1
BOT 123	Comprehensive Excel, Level I	1
<b>or</b>		
BOT 115	Essential Excel	1
BOT 124	Comprehensive Excel, Level II	1
BOT 125	Comprehensive Excel, Level III	1
BOT 126	Comprehensive Access, Level I	1
<b>or</b>		
BOT 116	Essential Access	1
BOT 127	Comprehensive Access, Level II	1
BOT 129	Comprehensive PowerPoint, Level I	1
<b>or</b>		
BOT 117	Essential PowerPoint	1
BOT 130	Comprehensive PowerPoint, Level II	<u>1</u>
	Total Required	<u>12</u>

## CADD TECHNOLOGY

Occupational preparation in Computer Aided Drafting and Design is the primary purpose of the CADD Technology degree program. Students are required to complete two core courses and then to select from two potential career paths: Building Design Industry or Manufacturing Industry. Adherence to industrial practices and standards is stressed with problem solving in a simulated industrial environment. Lower division requirements for transfer to the Engineering Program at SDSU may also be met.

### CAREER OPPORTUNITIES

CAD Technician in the field of Architecture and Civil, Electronic, Mechanical, Structural, and Surveying Engineering

#### Associate in Science Degree Requirements:

##### Core Curriculum

Course	Title	Units
CADD 115	Engineering Graphics	3
CADD 120ABCD	Basic CAD	3
		<u>6</u>

##### Areas of Emphasis:

#### A. BUILDING DESIGN INDUSTRY (Major Code: 53060)

CADD 127	Survey Drafting Technology	3
CADD 131	Architectural AutoCAD	3
CADD 132	3D AutoCAD	3
CADD 133	Architectural Revit	3
		<u>12</u>

#### Select two (2) of the following:

CADD/ENGR 125	3D Parametric Solid Modeling	3
CADD 126	Electronic Drafting	3
CADD 128	Dimensioning and Tolerancing	3
		<u>6</u>

Total Required Including Core Classes 24  
Plus General Education Requirements

#### B. MANUFACTURING INDUSTRY (Major Code: 53061)

CADD/ENGR 125	3D Parametric Solid Modeling	3
CADD 126	Electronic Drafting	3
CADD 128	Dimensioning and Tolerancing	3
		<u>9</u>

#### Select two (2) of the following:

CADD 127	Survey Drafting Technology	3
CADD 131	Architectural AutoCAD	3
CADD 132	3D AutoCAD	3
CADD 133	Architectural Revit	3
		<u>6</u>

Total Required Including Core Classes 21  
Plus General Education Requirements

### Certificate of Achievement

Students who complete only the courses required for the major including an area of emphasis qualify for a Certificate in CADD Technology in that area of emphasis. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## CHEMISTRY (Major Code: 59502)

The chemistry curriculum is designed to give students who choose to work toward a bachelor's degree a well-balanced, lower division program with a strong emphasis on fundamentals and problem solving. This major fulfills the lower division requirements (except for analytical chemistry) for chemistry majors and is typical of the requirements at four-year colleges and universities.

### CAREER OPPORTUNITIES

Chemists work in a variety of fields, primarily those of the chemical, biotechnological, environmental, biomedical, pharmaceutical, electronics, forensic, agricultural and food industries. They usually work in analysis, research, development or production of materials. Management, marketing and teaching opportunities are also available.

\*Agricultural Chemist  
\*Air Quality Control  
\*Analytical Chemist  
\*Biochemist  
\*Chemistry Teacher  
\*Dietician  
\*Environmental Technologist  
Fishery Specialist  
\*Food And Drug Inspector  
\*Forensic Specialist  
Laboratory Technician  
\*Materials Scientist  
Medical Technologist  
\*Microbiologist  
\*Organic Chemist  
\*Physician  
\*Polymer Chemist  
Sales Representative  
Sanitarian Technician

\*Bachelor Degree or higher required

#### Associate in Science Degree Requirements:

Course	Title	Units
CHEM 141	General Chemistry I	5
CHEM 142	General Chemistry II	5
CHEM 231	Organic Chemistry I	5
MATH 180	Analytic Geometry and Calculus I	5
MATH 280	Analytic Geometry and Calculus II	4
MATH 281	Intermediate Calculus	4
PHYC 190	Mechanics and Heat	5
PHYC 200	Electricity and Magnetism	5
PHYC 210	Wave Motion and Modern Physics	5
	Total Required	<u>43</u>
	Plus General Education Requirements	

#### NOTE:

- Students pursuing an emphasis in biochemistry should also take the following courses: BIO 210, 220, 221.
- Students who intend to enroll at UCSD should take MATH 285 and check with the Counseling Center regarding program options.



## CHILD DEVELOPMENT

The child development curriculum is designed to prepare students for employment as teachers, directors and aides in preschools and child care centers, including infant/toddler and extended day facilities. Coursework meets the educational components of the Department of Social Services license regulations for child care programs. The degree meets the educational requirements of the Teacher, Master Teacher and Site Supervisor Child Development Permits. The courses are also appropriate for parents, administrators, health care professionals, and others working with children. Courses are designed to partially meet lower division course preparation for students planning a bachelor's degree in Child Development.

### CAREER OPPORTUNITIES

- \*Adoption Counselor
- Camping Guide
- Child Care Specialist
- \*Child Psychologist
- Curriculum Development
- \*Development Specialist (Child, Adolescent and Family)
- \*Educational Consultant
- Infant/Toddler Teacher
- Outdoor Education Specialist
- Preschool Director
- Preschool Teacher
- Recreation Leader
- \*Recreation Specialist
- School Age Child Care Teacher
- \*Social Service Specialist
- Special Education Assistant – Children with Special Needs

\*Bachelor Degree or higher required

### I. CHILD DEVELOPMENT

The major consists of 27 units of core curriculum; remaining units are taken in an area of emphasis. Students must choose at least one area of emphasis. *All courses must be completed with a grade of "C" or better.*

#### Associate in Science Degree Requirements:

##### Core Curriculum

Course	Title	Units
CD 123	Introduction to Programs and Curriculum for Young Children	3
CD 125	Child Growth and Development	3
CD 126	Art for Child Development	3
CD 127	Science and Mathematics for Child Development	3
CD 128	Music and Movement for Child Development	3
CD 129	Language and Literature for Child Development	3
CD 131	Child, Family and Community	3
CD 134	Health, Safety and Nutrition for Teachers of Young Children	3
CD 141	Working with Children with Special Needs	3
		27

#### Areas of Emphasis:

##### A. INFANTS AND TODDLERS (Major Code: 55031)

CD 124	Infant and Toddler Development	3
CD 132	Field Experience Seminar	3
CD 143	Infant/Toddler Curriculum	3
CD 170	Field Experience-Infants & Toddlers	2
		11
	Total Required Including Core Classes Plus General Education Requirements	38

##### B. PRESCHOOL CHILDREN (Major Code: 55030)

CD 130	Curriculum: Developmentally Appropriate Practices	3
CD 132	Field Experience Seminar	3
CD 133	Field Experience for Child Development	2
		8
	Total Required Including Core Classes Plus General Education Requirements	35

#### Recommended Electives and Continuing Education Units:

CD 124	Infant and Toddler Development	3
CD 135	Parent-Child Interaction	3
CD 139	Infant/Parent Development	2
CD 145	Child Abuse and Family Violence in our Society	3
CD 157	Food and Nutrition for Children	3

#### Certificate of Achievement

Students who complete only the courses required for the major including an area of emphasis qualify for a Certificate in Child Development in that area of emphasis. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

### II. SCHOOL AGE CHILD CARE (Major Code: 56032)

Designed to prepare students for employment in child care programs for elementary school age children. Certificate requirements meet the Title 22 licensing standards for teachers in school age child care programs. Some courses also meet prerequisites for students who wish to transfer to elementary education programs. *All courses must be completed with a grade of "C" or better.*

#### Associate in Science Degree Requirements:

Course	Title	Units
CD 125	Child Growth and Development	3
CD 131	Child, Family and Community	3
CD 132	Field Experience Seminar	3
CD 134	Health, Safety and Nutrition for Teachers of Young Children	3
CD 148	Curriculum for School Age Child Care	3
CD 149	School Age Child Care Program Planning	3
CD 150	Field Experience for School Age Child Care	2
		20

**Select one (1) of the following:**

CD 137	Administration of Child Development Programs I	3
CD 141	Working with Children with Special Needs	3
CD 145	Child Abuse and Family Violence in our Society	3
CD 157	Food and Nutrition for Children	3
ED 110	Introduction to American Education	3
ES 253	Physical Education in Elementary Schools	3
MATH 125	Structure and Concepts of Elementary Mathematics I	3
MATH 126	Structure and Concepts of Elementary Mathematics II	3
MUS 118	Introduction to Music	4
		3-4
	Total Required	23-24
	Plus General Education Requirements	

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in School Age Child Care. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**CERTIFICATES OF PROFICIENCY:****I. EARLY CHILDHOOD INTERVENTION**

(Major Code: 57128)

This certificate prepares students for entry-level positions and greater opportunities for advancement in the early childhood field. The certificate is designed to demonstrate an area of expertise in working with young children with special needs in typical early childhood programs and programs specifically designed for young children with special needs. *All courses must be completed with a grade of "C" or better.*

**Career Opportunities**

Students completing the certificate may find employment as an inclusion specialist, inclusion aide, or intervention assistant in a wide variety of programs serving young children with special needs. These programs include but are not limited to Head Start, State Preschools, special day classes, intervention programs, home visit programs, community-based programs such as park, recreation and camping programs, and faith-based early childhood programs.

**Certificate Requirements:**

Course	Title	Units
CD 125*	Child Growth and Development	3
CD 134	Health, Safety and Nutrition for Teachers of Young Children	3
CD 141	Working with Children with Special Needs	3
		9

**Select two (2) of the following:**

CD 126*	Art for Child Development	3
CD 127*	Science and Mathematics for Child Development	3
CD 128*	Music and Movement for Child Development	3
CD 129*	Language and Literature for Child Development	3
CD 131*	Child, Family and Community	3
		6
	Total Required	15

\*Meets the educational components of the Department of Social Services license regulations for child care programs.

Students who complete the requirements above qualify for a Certificate of Proficiency in Early Childhood Intervention. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**II. RECREATIONAL LEADERSHIP–****OUTDOOR PROGRAMS (Major Code: 57123)**

This certificate offers specific training for an entry-level position or for advancement in child care and outdoor programs for children and families. The certificate is designed to demonstrate an area of expertise that may be used to attain employment in outdoor recreational programs.

**Career Opportunities**

Students completing the certificate may find employment with schoolage child care programs and with public, private and commercial park and recreation agencies. They may work with agencies serving youth and families, and with leisure-related businesses and tourism agencies. Career opportunities include naturalists, outdoor education specialists, park interpreters, camping guides, arts and crafts leaders, and park and recreation class teachers and aides.

**Certificate Requirements:**

Course	Title	Units
CD 125	Child Growth and Development	3
CD 157	Food and Nutrition for Children	3
CD 200	Introduction to Outdoor Education Programs	1
CD 201	Creative Activities for Outdoor Programs	1
CD 202	Field Experience for Recreational Leadership	1
ES 253	Physical Education in Elementary Schools	3
ES 270	Cooperative Games	1
	Total Required	13

Students who complete the requirements above and hold a current First Aid/CPR certification qualify for a Certificate of Proficiency in Recreational Leadership–Outdoor Programs. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## COMMUNICATION (Major Code: 56004)

This degree program is designed to provide the student with a broad base of communication classes that will provide training for entry into occupations in which verbal skills are important. Major requirements for the four-year degree in Communication vary from institution to institution. Students should consult the catalog of the transfer institution for specific requirements.

### CAREER OPPORTUNITIES

Advertising Assistant  
Announcer  
Arts Administrator  
College Professor  
Communication Consultant  
Journalist  
Lawyer  
Lobbyist  
Narrator  
Personnel Trainer  
Politician  
Proofreader  
Public Relations Assistant  
Researcher  
Sales Manager  
Teacher/Instructor

### Associate in Arts Degree Requirements:

Course	Title	Units
COMM 110	Introduction to Mass Communication	3
COMM 120	Interpersonal Communication	3
COMM 122	Public Speaking	3
COMM 123	Advanced Public Speaking	3
COMM 145	Argumentation	3
		15

### Select three (3) courses from the following:

COMM 124	Intercultural Communication	3
COMM 128*	Global Communication	3
COMM 135	Oral Interpretation: Analysis and Performance of Literature	3
COMM 136	Readers Theatre	3
COMM 137	Critical Thinking in Group Communication	3
COMM 144*	Interracial Communication	3
COMM 240A	Intercollegiate Forensics	3
COMM 240B	Intercollegiate Forensics	3
COMM 240C	Intercollegiate Forensics	3
COMM 240D	Intercollegiate Forensics	3
		9
	Total Required	24
	Plus General Education Requirements	

\*Offered at Grossmont College

## COMPUTATIONAL SCIENCE

(Major Code: 53130)

To meet the needs of the successful computer science, computational science or applied mathematics graduate, this degree program integrates the study of mathematical and computer sciences and prepares the student for immediate entry into a vocational field related to computer programming and/or further study in computer science, computational science or applied mathematics.

### CAREER OPPORTUNITIES

\*Actuary  
\*Computational Scientist  
\*Computer Engineer  
\*Mathematician  
\*Programmer Analyst  
Semiconductor Technician  
\*Software Engineer  
Software Technician  
\*Statistician  
†Systems Analyst  
\*Systems Engineer  
Technical Support Representative  
\*Bachelor Degree or higher required  
†Bachelor Degree normally recommended

### Associate in Science Degree Requirements:

Course	Title	Units
CS 182	Introduction to Java Programming	4
CS 282	Intermediate Java Programming and Fundamental Data Structures	4
CS 289	Computer Organization and Systems Programming	4
MATH 180	Analytic Geometry and Calculus I	5
MATH 245	Discrete Mathematics	3
MATH 280	Analytic Geometry and Calculus II	4
MATH 284	Linear Algebra	3
		27

### Select one (1) of the following:

MATH 150	Introduction to Computer Programming with FORTRAN	3
MATH 160	Elementary Statistics	3
MATH 281	Intermediate Calculus	4
		3-4

### Select one (1) of the following sequences:

BIO 130*	General Biology I	3
BIO 131*	General Biology I Laboratory	1
BIO 210	Biology II	4
<b>or</b>		
CHEM 141	General Chemistry I	5
CHEM 142	General Chemistry II	5
<b>or</b>		
PHYC 190	Mechanics and Heat	5
PHYC 200	Electricity and Magnetism	5
PHYC 210	Wave Motion and Modern Physics	5
		8-15
	Total Required	38-46
	Plus General Education Requirements	

\*BIO 220 and 221 may be substituted for BIO 130 and 131

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Computational Science. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

# COMPUTER AND INFORMATION SCIENCE

**Students who wish to enroll in Microsoft applications (Word, Excel, PowerPoint) should refer to Business Office Technology.**

## CAREER OPPORTUNITIES

- Communications Specialist
- Computer Game Programmer
- Computer Graphics Designer
- Computer Hardware Specialist
- Computer Help Desk Technician
- Computer Maintenance Technician
- Computer Software Technician
- \*Computer Systems Engineer
- \*Computing Analyst
- Cyber Café Owner
- \*Database Manager
- GIS (Geographic Information Systems) Specialist
- Information Specialist
- \*Information Systems Programmer
- LAN/WAN Manager
- Manufacturer's Representative
- Multimedia Designer
- \*Network Administrator
- \*Network Analyst
- Network Consultant
- Network Control Technician
- Network Training and Support Specialist
- \*Programmer Analyst
- Sales and Service
- \*Scientific Programmer
- Software Consultant
- \*Software Engineer/Designer
- \*Systems Analyst
- \*Systems Programmer
- Technical Support Representative
- \*Telecommunications Programmer
- \*Telecommunications Technician
- \*Telecommunications Technical Engineer
- Training Specialist
- Virtual Reality Developer
- Web Master
- Web Page Designer
- \*Bachelor Degree or higher required

## Course Equivalencies:

The following Cuyamaca and Grossmont College courses are considered similar enough to be treated as equivalent. No Modification of Major forms will be required for the departments to accept these courses from our sister campus.

Cuyamaca Course	Similar Grossmont Course	Cuyamaca Course	Similar Grossmont Course
BOT 120	.CSIS 120	CIS 191	.CSIS 113
BOT 120+121+122	.CSIS 173	CIS 201	*CSIS 140
BOT 121	.CSIS 121	CIS 211	.CSIS 134
BOT 122	.CSIS 122	CIS 215	.CSIS 135
BOT 123	.CSIS 123	CIS 221	.CSIS 190
BOT 123+124+125	.CSIS 175	CIS 230	.CSIS 230
BOT 124	.CSIS 124	CIS 240	.CSIS 276
BOT 125	.CSIS 125	CIS 270	.CSIS 251
BOT 126	.CSIS 126	CIS 291	.CSIS 213
BOT 127	.CSIS 127	CS 119	.CSIS 119
BOT 128	.CSIS 128	CS 180	.CSIS 115
BOT 129	.CSIS 129	CS 181	.CSIS 296
BOT 130	.CSIS 130	CS 182	.CSIS 293
BOT 131	.CSIS 131	CS 280	.CSIS 155
CIS 105	.CSIS 172	CS 281	.CSIS 297
CIS 110	.CSIS 110	CS 282	.CSIS 294
CIS 120	.CSIS 114	CS 289	.CSIS 165
CIS 140	.CSIS 174	GD 217	.CSIS 217
CIS 170A	.CSIS 151D	GD 222	.CSIS 137
CIS 190	.CSIS 112		

\*Does not satisfy prerequisite to CIS 202

## I. COMPUTER NETWORK ADMINISTRATION

(Major Code: 51134)

This degree program prepares students for careers in computer networking and related fields. Upon completion, students may find entry-level positions as network administrators, hardware technicians, data/voice/video cabling technicians, project managers, designers/estimators or as technical support personnel. Prepares students to work as team members in an information technology group which designs, evaluates, tests, installs and maintains corporate networks. Preparation for the following industry certifications: A+, Security+ and CCNA (Cisco Certified Network Associate).

### Associate in Science Degree Requirements:

Course	Title	Units
CIS 120	Computer Maintenance and A+ Certification	3
CIS 121	Network Cabling Systems	3
CIS 140	Databases	3
CIS 190	Windows Operating System	3
CIS 191	Linux Operating Systems	3
CIS 201	Cisco Networking Academy I	3
CIS 202	Cisco Networking Academy II	3
<b>or</b>		
CIS 125	Network+ Certification	3
CIS 263	Fundamentals of Network Security	3
		24

### Select one (1) of the following:

CIS 292	UNIX Shell Programming	2
CS 119	Program Design and Development	3
CS 180ABCD	Introduction to Visual Basic Programming	4
CS 182	Introduction to Java Programming	4
		2-4

### Select three (3) of the following:

CIS 203	Cisco Networking Academy III	3
CIS 204	Cisco Networking Academy IV	3
CIS 205	Cisco Networking Academy V	3
CIS 212	Introduction to Web Development	3
CIS 214	Web Server Management	3
CIS 240	Advanced Databases	3
CIS 262	Fundamentals of Wireless LANs	3
CIS 290	Windows System Administration	3
CIS 291	Linux System Administration	3
		9
Total Required		35-37
Plus General Education Requirements		

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Computer Network Administration. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.



## II. TELECOMMUNICATIONS NETWORKING TECHNOLOGY (Major Code: 51143)

This degree program prepares students with the technical and management skills necessary to enter careers in design, application, installation, management, operation and/or maintenance of computer and telecommunications networking systems including convergent voice, data and video communications over IP networks. Graduates will have specific strengths in the building, testing, operation and maintenance of computer and telecommunications networking systems.

### Associate in Science Degree Requirements:

Course	Title	Units
CIS 120	Computer Maintenance and A+ Certification	3
CIS 121	Network Cabling Systems	3
CIS 161	Fundamentals of Telecommunications	3
CIS 162	Network Diagramming Using MS Visio	1
CIS 190	Windows Operating System	3
<b>or</b>		
CIS 191	Linux Operating Systems	3
CIS 201	Cisco Networking Academy I	3
CIS 202	Cisco Networking Academy II	3
<b>or</b>		
CIS 125	Network+ Certification	3
CIS 261	Telecommunications and Convergence Technologies	3
CIS 262	Fundamentals of Wireless LANs	3
CIS 263	Fundamentals of Network Security	3
ENGR 270	Digital Systems	4
ET 110	Introduction to Basic Electronics	4
MATH 180	Analytic Geometry and Calculus I	5
		41

### Select one (1) of the following:

CS 119	Program Design and Development	3
CS 180ABCD	Introduction to Visual Basic Programming	4
CS 182	Introduction to Java Programming	4
		3-4
	Total Required	44-45
	Plus General Education Requirements	

## III. TELECOMMUNICATIONS NETWORKING TECHNICIAN (Major Code: 51144)

Certificate recipients will work in areas such as research, design, field service and technical support for telephone companies, low voltage cable installers, Internet service providers, cable and wireless communications companies, and communications equipment manufacturers.

### Certificate Requirements:

Course	Title	Units
CIS 120	Computer Maintenance and A+ Certification	3
CIS 121	Network Cabling Systems	3
CIS 161	Fundamentals of Telecommunications	3
CIS 162	Network Diagramming Using MS Visio	1
CIS 190	Windows Operating System	3
<b>or</b>		
CIS 191	Linux Operating Systems	3
CIS 201	Cisco Networking Academy I	3
CIS 202	Cisco Networking Academy II	3
<b>or</b>		
CIS 125	Network+ Certification	3
CIS 261	Telecommunications and Convergence Technologies	3
CIS 262	Fundamentals of Wireless LANs	3
CIS 263	Fundamentals of Network Security	3
ET 110	Introduction to Basic Electronics	4
		32

### Select one (1) of the following:

CS 119	Program Design and Development	3
CS 180ABCD	Introduction to Visual Basic Programming	4
CS 182	Introduction to Java Programming	4
		3-4
	Total Required	35-36

### Certificate of Achievement

Students who complete the requirements above qualify for a Certificate in Telecommunications Networking Technician. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**IV. WEB DEVELOPMENT (Major Code: 51139)**

This degree program provides students with practical experience creating websites and preparing them for entry-level positions as web designers, web programmers or web server administrators. The curriculum uses state of the art software and hardware typically found in the field of professional web development.

**Associate in Science Degree Requirements:**

Course	Title	Units
CIS 140	Databases	3
CIS 211	Web Markup Languages	3
CIS 212	Introduction to Web Development	3
CIS 213	Advanced Web Development	3
		12

**Select two (2) of the following:**

CIS 110	Principles of Information Systems	4
CIS 190	Windows Operating System	3
CIS 191	Linux Operating Systems	3
CIS 214	Web Server Management	3
CIS 290	Windows System Administration	3
		6-7

**Select two (2) of the following:**

CIS 215	JavaScript Programming	3
CIS 216	Active Server Pages	3
CIS 219	PHP/MySQL Dynamic Web-Based Applications	3
CS 119	Program Design and Development	3
CS 180ABCD	Introduction to Visual Basic Programming	4
		6-7

**Select three (3) of the following:**

CIS 221	Digital Video Editing and DVD Production	3
CIS 240	Advanced Databases	3
CIS 267	Directed Work Experience in CIS	1-4
GD 126ABCD	Photoshop Digital Imaging	3
GD 130	Professional Business Practices	3
GD 210	Professional Digital Photography I	3
GD 217	Web Graphics	3
GD 222	Flash Web Animation	3
GD 223	Advanced Flash Web Animation	3
		7-10
	Total Required	31-36
	Plus General Education Requirements	

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Web Development. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**CERTIFICATES OF PROFICIENCY:**

These certificates offer specific training either for entry-level positions or to augment related programs such as Computer Network Administration, Web Development, Business Office Technology or Graphic Design. The certificates are designed to demonstrate a relatively narrow expertise or skill area that may be used to attain a computer industry "niche" job.

Students who complete the requirements below qualify for a Certificate of Proficiency in that area of emphasis. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**I. CISCO SYSTEMS (Major Code: 57114)****Certificate Requirements:**

Course	Title	Units
CIS 201	Cisco Networking Academy I	3
CIS 202	Cisco Networking Academy II	3
CIS 203	Cisco Networking Academy III	3
CIS 204	Cisco Networking Academy IV	3
	Total Required	12

**II. COMPUTER PROGRAMMING (Major Code: 57115)****Certificate Requirements:**

Course	Title	Units
CS 180ABCD	Introduction to Visual Basic Programming	4
CS 182	Introduction to Java Programming	4
CS 280ABCD	Intermediate Visual Basic Programming	4
CS 282	Intermediate Java Programming and Fundamental Data Structures	4
	Total Required	16

**III. NETWORK SERVICING TECHNOLOGY**

(Major Code: 57117)

**Certificate Requirements:**

Course	Title	Units
CIS 120	Computer Maintenance and A+ Certification	3
CIS 121	Network Cabling Systems	3
CIS 201	Cisco Networking Academy I	3
CIS 202	Cisco Networking Academy II	3
	<b>or</b>	
CIS 125	Network+ Certification	3
		12

**Select one (1) of the following:**

CIS 190	Windows Operating System	3
CIS 191	Linux Operating Systems	3
		3
	Total Required	15

**IV. OPERATING SYSTEMS** (Major Code: 57118)**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CIS 190	Windows Operating System	3
CIS 191	Linux Operating Systems	3
CIS 290	Windows System Administration	3
CIS 291	Linux System Administration	3
CIS 292	UNIX Shell Programming	2
	Total Required	14

**V. TELECOMMUNICATIONS SERVICING TECHNOLOGY** (Major Code: 57122)**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CIS 120	Computer Maintenance and A+ Certification	3
CIS 121	Network Cabling Systems	3
CIS 161	Fundamentals of Telecommunications	3
CIS 201	Cisco Networking Academy I	3
CIS 202	Cisco Networking Academy II	3
or		
CIS 125	Network+ Certification	3
	Total Required	15

**VI. WEB DESIGN** (Major Code: 57119)**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CIS 211	Web Markup Languages	3
CIS 212	Introduction to Web Development	3
CIS 213	Advanced Web Development	3
		9

**Select two (2) of the following:**

CIS 215	JavaScript Programming	3
GD 126ABCD	Photoshop Digital Imaging	3
GD 210	Professional Digital Photography I	3
GD 217	Web Graphics	3
GD 222	Flash Web Animation	3
GD 223	Advanced Flash Web Animation	3
		6
	Total Required	15

**VII. WEB PROGRAMMING** (Major Code: 57120)**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CIS 140	Databases	3
CIS 211	Web Markup Languages	3
		6

**Select three (3) of the following:**

CIS 215	JavaScript Programming	3
CIS 216	Active Server Pages	3
CIS 219	PHP/MySQL Dynamic Web-Based Applications	3
CIS 240	Advanced Databases	3
CS 119	Program Design and Development	3
and		
CS 119L	Program Design and Development Lab	1
GD 223	Advanced Flash Web Animation	3
		9-10
	Total Required	15-16

**VIII. WEB SERVER MANAGEMENT** (Major Code: 57121)**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CIS 191	Linux Operating Systems	3
CIS 211	Web Markup Languages	3
CIS 290	Windows System Administration	3
		9

**Select one (1) of the following:**

CIS 125	Network+ Certification	3
CIS 201	Cisco Networking Academy I	3
		3

**Select one (1) of the following:**

CIS 215	JavaScript Programming	3
CIS 216	Active Server Pages	3
CIS 219	PHP/MySQL Dynamic Web-Based Applications	3
		3
	Total Required	15

## ELEMENTARY EDUCATION

(Major Code: 59504)

This degree program is designed to provide lower division preparation for transfer to San Diego State University as a Liberal Studies major. Students interested in transferring to another college or university should check the requirements of that institution.

Students who complete the program will receive an Associate Degree in Elementary Education and may request certification of lower division general education coursework required by the California State University system.

Because the program emphasizes a strong general education approach, it may be an appropriate major for a variety of career options. Students are encouraged to refer to the San Diego State University catalog and/or consult with an academic advisor before selecting the various options listed below.

### CAREER OPPORTUNITIES

- \*Administrator
  - Audiovisual Specialist
  - School Clerical Worker
- \*Counselor
- \*Educational Consultant
- \*Educational Psychologist
- \*Educational Therapist
- \*Educational Writer
  - Food Service
- \*Guidance Worker
- \*Librarian
  - Library Technician
- \*Social Psychologist
- \*Speech Pathologist/Audiologist
- \*Teacher
  - Teacher's Aide
  - Tutor
- \*Bachelor Degree or higher required

### Associate in Arts Degree Requirements:

Course	Title	Units
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### COMPOSITION, ORAL COMMUNICATION, AND LITERATURE

#### 1. Composition (minimum 6 units)

ENGL 120 <b>and</b>	College Composition and Reading	3
ENGL 124* <b>or</b>	Advanced Composition: Critical Reasoning and Writing	3
PHIL 125 <b>or</b>	Critical Thinking	3
PHIL 130	Logic	3

#### 2. Communication (minimum 3 units)

COMM 120	Interpersonal Communication	3
COMM 122	Public Speaking	3

#### 3. Literature (minimum 3 units)

ENGL 122	Introduction to Literature	3
ENGL 270	World Literature I	3
ENGL 271	World Literature II	3

### MATHEMATICS AND SCIENCES

#### 4. Mathematics (minimum 7.5 units)

MATH 125	Structure and Concepts of Elementary Mathematics I	3
MATH 126	Structure and Concepts of Elementary Mathematics II	3
MATH 128	Children's Mathematical Thinking	1.5

#### 5. Biological Sciences (minimum 4 units)

BIO 128 <b>or</b>	Principles of Biology for Future Educators	4
BIO 130 <b>and</b>	General Biology I	3
BIO 131	General Biology I Laboratory	1

#### 6. Physical Sciences (minimum 3 units)

GEOL 104	Earth Science	3
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### SOCIAL SCIENCE AND HISTORY

#### 7. Global Perspective (minimum 3 units)

GEOG 106	World Regional Geography	3
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#### 8. American Institutions (minimum 6 units)

HIST 108 <b>and</b>	Early American History	3
HIST 109	Modern American History	3

*For other options, see a counselor*

#### 9. Civilizations (minimum 3 units)

HIST 100	Early World History	3
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### VISUAL AND PERFORMING ARTS/HUMANITIES

#### 10. Music (minimum 4 units)

MUS 001	Rudiments of Musicianship	4
MUS 118	Introduction to Music	4

#### 11. Art/Humanities (minimum 3 units)

ART 100	Art Appreciation	3
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#### 12. Human Growth and Development (choose one option):

##### Option I:

CD 125	Child Growth and Development	3
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##### Option II:

PSY 120 <b>and</b>	Introductory Psychology	3
PSY 165	Developmental Psychology	3

#### 13. General Education/Humanities (choose one option):

Option I: 3rd semester of a foreign language: FREN 220, SPAN 220, ARBC 220 or ASL 220.

Option II: If 3rd or 4th year foreign language in high school has been completed, choose 3 units from RELG 120, 130 or PHIL 140.

Option III: If 3rd or 4th year foreign language in high school has been completed, choose 1st semester of a *different* foreign language (FREN 120, SPAN 120, ARBC 120 or ASL 120.)

#### 14. Additional Requirements (minimum 6 units)

ES 253	Physical Education in Elementary Schools	3
HED 120	Personal Health and Lifestyles	3
ES Activity**	(At least two courses)	2-3
Total Required		59.5-65.5

\*Preferred

\*\*To fulfill a major requirement, all courses, including Exercise Science (ES) activity courses, must be taken for a letter grade. Courses taken for Credit/No Credit will not fulfill major requirements.



## ENGINEERING

This degree program is designed to cover the first two years of a four-year program leading to the Bachelor's Degree in Engineering at most four-year colleges and universities. While the bachelor's degree is usually the minimum needed to practice as an engineer, the associate degree will permit an individual to find work in most engineering firms as an engineering aide. The certificate will permit an individual to work as an engineering technician.

### CAREER OPPORTUNITIES

- \* Aerospace Engineer
  - \* Agricultural Engineer
  - \* Architectural Engineer
  - \* Biomedical Engineer
  - \* CAD/CAM Engineer
  - \* Chemical Engineer
  - \* Civil Engineer
    - Civil Engineering Technician
  - \* Computer Engineer
  - \* Electrical Engineer
    - Electrical Engineering Technician
  - \* Environmental Engineer
  - \* Geological Engineer
  - \* Industrial Engineer
    - Industrial Engineering Technician
  - \* Manufacturing Engineer
  - \* Marine Engineer
  - \* Materials Engineer
  - \* Mechanical Engineer
    - Mechanical Engineering Technician
  - \* Mining Engineer
  - \* Nuclear Engineer
  - \* Petroleum Engineer
  - \* Structural Engineer
  - \* Systems Engineer
  - \* Robotics Engineer
- \* Bachelor's degree or higher required

### I. CIVIL ENGINEERING (Major Code: 53132)

#### Associate in Science Degree Requirements:

Course	Title	Units
CHEM 141	General Chemistry I	5
ENGR 100	Introduction to Engineering and Engineering Graphics	2
<b>or</b>		
CADD 115	Engineering Graphics	3
ENGR 119	Basic Engineering CAD	3
<b>or</b>		
CADD 120ABCD	Basic CAD	3
ENGR 120	Engineering Computer Applications	3
ENGR 200	Engineering Mechanics–Statics	3
ENGR 218	Plane Surveying	4
<b>or</b>		
SURV 218	Plane Surveying	4
ENGR 220	Engineering Mechanics–Dynamics	3
MATH 160	Elementary Statistics	3
MATH 180	Analytic Geometry and Calculus I	5
MATH 280	Analytic Geometry and Calculus II	4
MATH 281	Intermediate Calculus	4
MATH 285	Differential Equations	3
PHYC 190	Mechanics and Heat	5
PHYC 200	Electricity and Magnetism	5
Total Required		52-53
Plus General Education Requirements		

### II. CIVIL ENGINEERING (Major Code: 53133)

#### Certificate Requirements:

Course	Title	Units
CADD 127	Survey Drafting Technology	3
CHEM 141	General Chemistry I	5
ENGR 100	Introduction to Engineering and Engineering Graphics	2
<b>or</b>		
CADD 115	Engineering Graphics	3
ENGR 119	Basic Engineering CAD	3
<b>or</b>		
CADD 120ABCD	Basic CAD	3
ENGR 120	Engineering Computer Applications	3
ENGR 200	Engineering Mechanics–Statics	3
ENGR 218	Plane Surveying	4
<b>or</b>		
SURV 218	Plane Surveying	4
ENGR 220	Engineering Mechanics–Dynamics	3
MATH 180	Analytic Geometry and Calculus I	5
MATH 280	Analytic Geometry and Calculus II	4
PHYC 190	Mechanics and Heat	5
Total Required		40-41

#### Certificate of Achievement

Students who complete the certificate requirements above qualify for a Certificate in Civil Engineering. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**III. ELECTRICAL AND COMPUTER ENGINEERING**

(Major Code: 53134)

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CHEM 141	General Chemistry I	5
CS 181	Introduction to C++ Programming	4
<b>or</b>		
CS 182	Introduction to Java Programming	4
CS 281	Intermediate C++ Programming	4
<b>or</b>		
CS 282	Intermediate Java Programming and Fundamental Data Structures	4
ENGR 100	Introduction to Engineering and Engineering Graphics	2
<b>or</b>		
CADD 115	Engineering Graphics	3
ENGR 210	Electric Circuits	3
ENGR 270	Digital Systems	4
MATH 180	Analytic Geometry and Calculus I	5
MATH 280	Analytic Geometry and Calculus II	4
MATH 281	Intermediate Calculus	4
MATH 284	Linear Algebra	3
MATH 285	Differential Equations	3
PHYC 190	Mechanics and Heat	5
PHYC 200	Electricity and Magnetism	5
Total Required		51-52
Plus General Education Requirements		

**IV. ELECTRICAL AND COMPUTER ENGINEERING**

(Major Code: 53135)

**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CADD 126	Electronic Drafting	3
CS 181	Introduction to C++ Programming	4
<b>or</b>		
CS 182	Introduction to Java Programming	4
CS 281	Intermediate C++ Programming	4
<b>or</b>		
CS 282	Intermediate Java Programming and Functional Data Structures	4
ENGR 100	Introduction to Engineering and Engineering Graphics	2
<b>or</b>		
CADD 115	Engineering Graphics	3
ENGR 119	Basic Engineering CAD	3
<b>or</b>		
CADD 120ABCD	Basic CAD	3
ENGR 210	Electric Circuits	3
ENGR 270	Digital Systems	4
ET 110	Introduction to Basic Electronics	4
MATH 180	Analytic Geometry and Calculus I	5
MATH 280	Analytic Geometry and Calculus II	4
MATH 284	Linear Algebra	3
PHYC 190	Mechanics and Heat	5
PHYC 200	Electricity and Magnetism	5
Total Required		49-50

**Certificate of Achievement**

Students who complete the certificate requirements above qualify for a Certificate in Electrical and Computer Engineering. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**V. MECHANICAL AND AEROSPACE ENGINEERING**

(Major Code: 53136)

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CHEM 141	General Chemistry I	5
ENGR 100	Introduction to Engineering and Engineering Graphics	2
<b>or</b>		
CADD 115	Engineering Graphics	3
ENGR 119	Basic Engineering CAD	3
<b>or</b>		
CADD 120ABCD	Basic CAD	3
ENGR 120	Engineering Computer Applications	3
ENGR 200	Engineering Mechanics–Statics	3
ENGR 210	Electric Circuits	3
ENGR 220	Engineering Mechanics–Dynamics	3
ENGR 260	Engineering Materials	3
MATH 180	Analytic Geometry and Calculus I	5
MATH 280	Analytic Geometry and Calculus II	4
MATH 281	Intermediate Calculus	4
MATH 285	Differential Equations	3
PHYC 190	Mechanics and Heat	5
PHYC 200	Electricity and Magnetism	5
PHYC 210	Wave Motion and Modern Physics	5
Total Required		56-57
Plus General Education Requirements		

**VI. MECHANICAL AND AEROSPACE ENGINEERING**

(Major Code: 53137)

**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CHEM 141	General Chemistry I	5
ENGR 100	Introduction to Engineering and Engineering Graphics	2
<b>or</b>		
CADD 115	Engineering Graphics	3
ENGR 119	Basic Engineering CAD	3
<b>or</b>		
CADD 120ABCD	Basic CAD	3
ENGR 120	Engineering Computer Applications	3
ENGR 125	3D Parametric Solid Modeling	3
<b>or</b>		
CADD 125	3D Parametric Solid Modeling	3
ENGR 200	Engineering Mechanics–Statics	3
ENGR 220	Engineering Mechanics–Dynamics	3
ENGR 260	Engineering Materials	3
MATH 180	Analytic Geometry and Calculus I	5
MATH 280	Analytic Geometry and Calculus II	4
PHYC 190	Mechanics and Heat	5
Total Required		39-40

**Certificate of Achievement**

Students who complete the certificate requirements above qualify for a Certificate in Mechanical and Aerospace Engineering. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## ENGLISH (Major Code: 51037)

This major fulfills lower division requirements at most four-year colleges and universities and thus provides a broad-based foundation for transfer. For particular requirements, transfer students should consult the appropriate four-year college or university catalog.

The study of English gives lifelong pleasure to students in exploring and understanding how language works to express human ideas and feelings. English course work also helps people succeed in such diverse fields as teaching, writing, editing, journalism, advertising, public relations, law, film and video work, politics, business and medicine.

### CAREER OPPORTUNITIES

- Actor/Actress
  - \* College English Professor
  - \* Copywriter
  - \* Editor
    - Fiction/Nonfiction Writer
    - Foreign Service Officer
  - †Freelance Writer
  - \* Lawyer
  - \* Librarian
  - \* Media Planner
  - \* Museum Curator
  - †Newscaster
  - †Playwright
  - \* Publisher
  - \* Reporter
  - \* Researcher
  - \* Secondary School Teacher
- \* Bachelor Degree or higher required  
 † Bachelor Degree normally recommended

### Associate in Arts Degree Requirements:

<i>Course</i>	<i>Title</i>	<i>Units</i>
ENGL 120	College Composition and Reading	3
ENGL 122	Introduction to Literature	3
ENGL 124	Advanced Composition: Critical Reasoning and Writing	3
ENGL 126	Creative Writing	3
ENGL 270	World Literature I	3
ENGL 271	World Literature II	3
		18

### Select two (2) of the following:

ENGL 221	British Literature I	3
ENGL 222	British Literature II	3
ENGL 231	American Literature I	3
ENGL 232	American Literature II	3
ENGL 275	Literary Period	3
ENGL 276	Major Author	3
ENGL 277	Literary Theme	3
		6

### Select one (1) of the following:

ENGL 201	Introduction to Images of Women in Literature	3
ENGL 202	Introduction to Film as Literature	3
ENGL 207	Romantic Fiction	3
ENGL 214	Masterpieces of Drama	3
ENGL 217	Fantasy and Science Fiction Survey	3
		3

### Select one (1) of the following:

ANTH 120	Cultural Anthropology	3
HIST 100	Early World History	3
HIST 101	Modern World History	3
HIST 105	Early Western Civilization	3
HIST 106	Modern Western Civilization	3
HUM 120	European Humanities	3
HUM 140	American Humanities	3
HUM 155	Mythology	3
PHIL 115	History of Philosophy I	3
PHIL 117	History of Philosophy II	3
RELG 215	Introduction to the New Testament	3
		3
	Total Required	30
	Plus General Education Requirements	

### Recommended Electives:

Students planning to transfer to four-year institutions to complete a bachelor's degree in English are STRONGLY urged to take the following courses, depending on the requirements at those schools:

Two (2) sequential semesters of a single foreign language	10
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### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in English. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## ENTREPRENEURSHIP—SMALL BUSINESS MANAGEMENT

(Major Code: 50047)

This curriculum provides a course of study for students who are interested in working toward an associate degree or certificate while developing an appreciation and understanding of the functional areas within the small business environment. This degree program provides a working knowledge of small business operations to both the prospective business person as well as the owner/manager of an existing business, and is co-sponsored by the Small Business Administration.

### CAREER OPPORTUNITIES

Administrative Assistant  
Assistant Manager  
Bookkeeper  
Small Business Owner/Manager

### Associate in Science Degree Requirements:

Course	Title	Units
BUS 109	Elementary Accounting	3
<b>or</b>		
BUS 120	Financial Accounting	4
BUS 110	Introduction to Business	3
BUS 111	Entrepreneurship: Starting and Developing a Business	3
BUS 125	Business Law: Legal Environment of Business	3
BUS 128	Business Communication	3
		15-16

### Select two (2) of the following:

BUS 112	Entrepreneurship: Successful Marketing	3
BUS 141	Entrepreneurship: Managing a New Business	3
BUS 146	Marketing	3
BUS 156	Principles of Management	3
BUS 176	Computerized Accounting Applications	2
CIS 212	Introduction to Web Development	3
		5-6

### Select at least three (3) units from the following:

BOT 095	Keyboarding Skill Reinforcement	1
BOT 096	Computer Basics for the Office	1
BOT 097	Windows Basics for the Office	1
BOT 100	Basic Keyboarding	1
BOT 101AB	Keyboarding/Document Processing	1.5
BOT 102AB	Intermediate Keyboarding/Document Processing I-II	3
BOT 114	Essential Word	1
BOT 115	Essential Excel	1
BOT 116	Essential Access	1
BOT 117	Essential PowerPoint	1
CIS 105	Introduction to Computing	3
CIS 110	Principles of Information Systems	4
		3
	Total Required	23-25
	Plus General Education Requirements	

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Entrepreneurship—Small Business Management. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## ENVIRONMENTAL HEALTH AND SAFETY TECHNOLOGY

This degree and certificate program provides entry level skills as well as upgrading/refining existing skills of individuals employed in the field of Environmental Technology. The curriculum prepares students for transfer to four-year institutions in an Environmental Technology or related major. Courses are designed for students pursuing careers in Environmental Management and Occupational Safety and Health with an emphasis on training, regulatory compliance and program development, consulting, pollution prevention, recycling, remediation, conservation and program management.

### CAREER OPPORTUNITIES

\*Air Quality Engineer  
Asbestos Materials Building Remover  
Associate Toxic Waste Specialist  
Chemical Handler  
\*Environmental Engineer  
Environmental Hazardous Material Technician  
Environmental Health and Safety Specialist  
\*Environmental Journalist  
\*Environmental Lawyer  
Environmental Manager  
\*Environmental Protection Specialist  
Environmental Research – Test Technician  
Game or Fishery Technician  
\*Geologist  
Health and Safety Technician  
Industrial Hygiene Technician  
Land Use and Planning Technician  
Mold Remediation Technician  
Occupational Health and Safety Technician  
Pollution Control Technician  
Recycling Coordinator  
Risk Management Officer  
Risk Management Technician  
Safety Officer  
Safety Specialist  
\*Soils Analyst  
Solar Energy Installer  
Wastewater Treatment Operator  
Water Treatment Operator  
\*Bachelor Degree or higher required

**I. ENVIRONMENTAL MANAGEMENT**

(Major Code: 51046)

**Associate in Science Degree Requirements:**

Course	Title	Units
BIO 112	Contemporary Issues in Environmental Resources	3
BIO 130	General Biology I	3
BIO 131	General Biology I Laboratory	1
CHEM 115	Fundamentals of Chemistry	4
ENVT 100	Introduction to Environmental and Occupational Safety and Health (OSH) Technology	4
ENVT 110	Pollution Prevention	3
ENVT 150	Hazardous Waste Management Applications	4
ENVT 200	Hazardous Materials Management (HMM) Applications	4
ENVT 210	Industrial Wastewater and Stormwater Management	4
ENVT 215	Air Quality Management	3
ENVT 230	Safety and Emergency Response	4
ENVT 240*	Cooperative Work Experience	1-4
		<u>38-41</u>

**Select one (1) of the following:**

CIS 110	Principles of Information Systems	4
COMM 122	Public Speaking	3
SPAN 120	Spanish I	5
		<u>3-5</u>
	Total Required	41-46
	Plus General Education Requirements	

\*Student must complete ENVT 100 to be eligible for this course

**II. ENVIRONMENTAL TECHNICIAN**

(Major Code: 51047)

**Certificate Requirements:**

Course	Title	Units
ENVT 100	Introduction to Environmental and Occupational Safety and Health (OSH) Technology	4
ENVT 110	Pollution Prevention	3
ENVT 150	Hazardous Waste Management Applications	4
ENVT 200	Hazardous Materials Management (HMM) Applications	4
ENVT 210	Industrial Wastewater and Stormwater Management	4
ENVT 215	Air Quality Management	3
ENVT 230	Safety and Emergency Response	4
ENVT 240*	Cooperative Work Experience	1-3
	Total Required	<u>27-29</u>

\*Student must complete ENVT 100 to be eligible for this course

**Certificate of Achievement**

Students who complete the requirements above qualify for a Certificate in Environmental Technician. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**III. OCCUPATIONAL SAFETY AND HEALTH****(OSH) MANAGEMENT** (Major Code: 51048)**Associate in Science Degree Requirements:**

Course	Title	Units
BIO 130	General Biology I	3
BIO 131	General Biology I Laboratory	1
CHEM 115	Fundamentals of Chemistry	4
ENVT 100	Introduction to Environmental and Occupational Safety and Health (OSH) Technology	4
ENVT 130	Environmental/Occupational Health Effects of Hazardous Materials	3
ENVT 135	General Industry Safety Standards	3
ENVT 145	Construction Safety Standards	3
ENVT 200	Hazardous Materials Management (HMM) Applications	4
ENVT 201	Introduction to Industrial Hygiene and Occupational Health	4
ENVT 205	Safety and Risk Management Administration	4
ENVT 230	Safety and Emergency Response	4
ENVT 240*	Cooperative Work Experience	1-4
		<u>38-41</u>

**Select one (1) of the following:**

CIS 110	Principles of Information Systems	4
COMM 122	Public Speaking	3
SPAN 120	Spanish I	5
		<u>3-5</u>
	Total Required	41-46
	Plus General Education Requirements	

\*Student must complete ENVT 100 to be eligible for this course

**IV. OCCUPATIONAL SAFETY AND HEALTH (OSH)****TECHNICIAN** (Major Code: 51049)**Certificate Requirements:**

Course	Title	Units
ENVT 100	Introduction to Environmental and Occupational Safety and Health (OSH) Technology	4
ENVT 130	Environmental/Occupational Health Effects of Hazardous Materials	3
ENVT 135	General Industry Safety Standards	3
ENVT 200	Hazardous Materials Management (HMM) Applications	4
ENVT 201	Introduction to Industrial Hygiene and Occupational Health	4
ENVT 240*	Cooperative Work Experience	1-4
		<u>19-22</u>

**Select two (2) of the following:**

ENVT 145	Construction Safety Standards	3
ENVT 205	Safety and Risk Management Administration	4
ENVT 230	Safety and Emergency Response	4
		<u>7-8</u>
	Total Required	26-30

\*Student must complete ENVT 100 to be eligible for this course

**Certificate of Achievement**

Students who complete the requirements above qualify for a Certificate in Occupational Safety and Health (OSH) Technician. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.



## EXERCISE SCIENCE (Major Code: 52001)

This degree program is designed to prepare students for a variety of careers including education, physical therapy, coaching, personal training and other allied health professions by providing classes oriented toward fitness, wellness and health promotion throughout the lifespan. The major also provides preparation for transfer to a four-year college in physical education, exercise physiology, kinesiology, nutrition or athletic training, as well as teacher credentialing programs.

### CAREER OPPORTUNITIES

- Aerobics Instructor
- Athletics Coach
- \*Athletics Trainer
- \*Cardiovascular Rehabilitation
- \*College Professor
- \*Elementary School Teacher
- \*Exercise Physiologist
- \*Health Club Manager
- Personal Trainer
- \*Physical Therapist/ Assistant
- \*Registered Dietician
- \*Secondary School Teacher
- \*Teaching

\*Bachelor Degree or higher required

### Associate in Science Degree Requirements:

Course	Title	Units
BIO 130	General Biology I	3
BIO 131	General Biology I Laboratory	1
BIO 140	Human Anatomy	5
CHEM 115	Fundamentals of Chemistry	4
COMM 122	Public Speaking	3
ES 014ABC	Body Building	1.5
ES 250	Introduction to Physical Education	2
ES 255	Care and Prevention of Athletic Injuries	3
HED 158	Nutrition for Athletes	3
PSY 120	Introductory Psychology	3
SOC 120	Introductory Sociology	3
		31.5

### Select one (1) of the following:

BIO 215	Statistics for Life Sciences	3
MATH 160	Elementary Statistics	3
PSY 215	Statistics for the Behavioral Sciences	3
		3

### Select two (2) of the following (fulfills the activity requirement for the Associate Degree):

ES 001	Adapted Physical Exercise	1
ES 009	Aerobic Dance Exercise	1
ES 019ABC	Physical Fitness	1.5
ES 060ABC	Badminton	1
ES 076ABC	Tennis	1
ES 125ABC	Golf	1
ES 155ABC	Basketball	1
ES 170ABC	Soccer	1
ES 171ABC	Softball	1
ES 175ABC	Volleyball	1
		2-2.5
Total Required		36.5-37
Plus General Education Requirements		

### CERTIFICATE OF PROFICIENCY:

#### RECREATIONAL LEADERSHIP–SCHOOL-BASED PROGRAMS (Major Code: 57124)

This certificate offers specific training for an entry-level position or for advancement in child care and outdoor programs for children and families. It is designed to demonstrate an area of expertise that may be used to attain employment in areas of school-based recreation and fitness programs.

### CAREER OPPORTUNITIES

The certificate is designed to prepare an individual for a position in an elementary or middle school, YMCA, recreation center, day or residential camp, or after school day care program. This is great “stepping-stone” training for anyone who wants to major in Exercise Science, Recreation Elementary Education or Child Development, providing the student with the expertise to enter the entry-level job market with knowledge of sound principles of fitness and developmentally appropriate recreation.

### Certificate Requirements:

Course	Title	Units
CD 125	Child Growth and Development	3
CD 157	Food and Nutrition for Children	3
ES 253	Physical Education in Elementary Schools	3
ES 270	Cooperative Games	1
ES 271	Fitness Walking with Children	1
ES 272	Issues in Childhood Obesity	1
ES 273	Field Experience in School-Based Recreational Leadership	1
Total Required		13

Students who complete the requirements above and hold a current First Aid/CPR certification qualify for a Certificate of Proficiency in Recreational Leadership–School-Based Programs. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## GENERAL MAJOR

The primary purpose of the General Major is to meet the needs of students who have not decided on a specific career path or who wish to transfer to a four-year institution as an undeclared major while earning an associate degree. Outlined below are the requirements for the General Major degrees in both the Associate in Arts and Associate in Science.

### GENERAL MAJOR FOR THE ASSOCIATE IN ARTS DEGREE (Major Code: 59301)

The program of study consists of 18 or more units in a single discipline or related discipline designed to meet the student's individual needs. Courses in which a "CR" has been earned may not be applied toward the above requirements. Students should consult a counselor for aid in developing this program of study.

The General Major might consist of courses in preparation for transfer to a specific major in another institution or groupings of general, occupational and technical courses which would best prepare students for employment.

### GENERAL MAJOR FOR THE ASSOCIATE IN SCIENCE DEGREE (Major Code: 59302)

The program of study consists of 18 or more units in MATH 103 or higher and/or natural science courses. Courses in which a "CR" has been earned may not be applied toward the above requirement.

## GRAPHIC DESIGN (Major Code: 50127)

Students in this degree program develop entry level skills in design aesthetics, typography, illustration, digital imaging, page layout, web design and professional business practices. Courses provide training with state of the art computer hardware and software used in the graphic design profession. Students develop a professional portfolio for job interviews.

**Designed for a two-year degree or certificate only. Students interested in pursuing a bachelor's degree in Graphic Design should refer to "Art-Graphic Design (Transfer)." Students should also consult the catalog of the transfer institution for specific requirements.**

### CAREER OPPORTUNITIES

Graphic Designer  
Illustrator  
Web Page Designer  
Technical Illustrator  
Package Designer  
Display Designer  
Cartoonist  
Desktop Publisher  
\*Advertising Director  
\*Art Director  
\*Marketing Director  
Multimedia Designer

\*Bachelor Degree or higher required

### Associate in Science Degree Requirements:

Course	Title	Units
ART 124	Drawing I	3
CIS 212	Introduction to Web Development	3
GD 105	Fundamentals of Digital Media	3
GD 110	Graphic Design Principles	3
GD 125	Typography	3
GD 126ABCD	Photoshop Digital Imaging	3
GD 129	Page Layout	3
GD 130	Professional Business Practices	3
GD 225	Digital Illustration	3
		<hr/> 27

### Select three (3) of the following:

ART 230	Figure Drawing I	3
GD 210	Professional Digital Photography I	3
GD 211	Professional Digital Photography II	3
GD 217	Web Graphics	3
GD 222	Flash Web Animation	3
GD 223	Advanced Flash Web Animation	3
GD 230	Graphic Design Internship	1-4
		<hr/> 7-10
	Total Required	34-37
	Plus General Education Requirements	

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Graphic Design. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**CERTIFICATES OF PROFICIENCY:**

These certificates offer specific training either for an entry-level position or to augment related programs such as Web Development or Graphic Design. The certificates are designed to demonstrate a relatively narrow expertise or skill area that may be used to attain a graphic design “niche” job.

Students who complete the requirements below qualify for a Certificate of Proficiency in that area of emphasis. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**I. DIGITAL PHOTOGRAPHY (Major Code: 57125)**

**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
GD 110	Graphic Design Principles	3
GD 126ABCD	Photoshop Digital Imaging	3
GD 130	Professional Business Practices	3
GD 210	Professional Digital Photography I	3
GD 211	Professional Digital Photography II	3
	Total Required	<u>15</u>

**II. WEB GRAPHICS (Major Code: 57126)**

**Certificate Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CIS 212	Introduction to Web Development	3
GD 110	Graphic Design Principles	3
GD 210	Professional Digital Photography I	3
GD 217	Web Graphics	3
GD 222	Flash Web Animation	3
	Total Required	<u>15</u>

**HISTORY (Major Code: 54060)**

This major prepares students to transfer to four-year institutions for continued study in the field of history. The degree program fulfills the lower division requirements for most majors in the History Department at San Diego State University and is typical of requirements at other four-year schools. For special requirements, transfer students should consult the catalog of the college or university of their choice. History classes provide useful background for students in such fields as history, education, political science and law.

**CAREER OPPORTUNITIES**

- \*Anthropologist
- \*Archaeologist
- Attorney
- \*Cartographer
- \*College History Professor
- \*Historian
- \*Intelligence Analyst
- \*Journalist
- Legislative Assistant
- Politician
- \*Research Historian
- \*Secondary School Teacher
- Travel Advisor
- Technical Writer
- \*Textbook Writer/Editor

\*Bachelor Degree or higher required

**Associate in Arts Degree Requirements:**

**Select twelve (12) units from any two (2) of the following sequences:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
HIST 100	Early World History	
HIST 101	Modern World History	6
HIST 105	Early Western Civilization	
HIST 106	Modern Western Civilization	6
HIST 108	Early American History	
HIST 109	Modern American History	6
		<u>12</u>

**Select six (6) units from the following:**

HIST 118	U.S. History: Chicano/Chicana Perspectives I	3
HIST 119	U.S. History: Chicano/Chicana Perspectives II	3
HIST 122	Women in Early American History	3
HIST 123	Women in Modern American History	3
HIST 124	History of California	3
HIST 180	U.S. History: Black Perspectives I	3
HIST 181	U.S. History: Black Perspectives II	3
HIST 210	Women in Western Civilization	3
		<u>6</u>

**Foreign Language Requirement:**

Competency (equivalent to that which is normally attained through three consecutive courses of college study) is required in one foreign language as part of the preparation for the major. NOTE: One year of a high school foreign language is equivalent to one semester of a college foreign language.

Total Required	33
Plus General Education Requirements	

**Recommended Electives:**

- ART 140, 141; ENGL 221, 222, 231, 232; GEOG 130; POSC 121, 124, 140; RELG 120, 130

## MANAGEMENT (Major Code: 53047)

This degree program is designed to provide students with the skills necessary to be successful as a manager in today's demanding organizational climate. The curriculum is beneficial to men or women who aspire to a mid-level or higher management position in any type of organization including business, government and service organizations.

### CAREER OPPORTUNITIES

- \*Bank Officer
- Claim Adjuster
- †Computer Operations Supervisor
- \*Director, Research and Development
- Employment Interviewer
- Financial Planner
- \*Hospital Administrator
- Import-Export Agent
- Management Trainee
- †Management Consultant
- Office Manager
- Stock Broker
- \*Teacher, College

\*Bachelor Degree or higher required

†Bachelor Degree normally recommended

### Associate in Science Degree Requirements:

<i>Course</i>	<i>Title</i>	<i>Units</i>
BUS 115	Human Relations in Business	3
BUS 120	Financial Accounting	4
BUS 125	Business Law: Legal Environment of Business	3
BUS 128	Business Communication	3
BUS 155	Human Resources Management	3
BUS 156	Principles of Management	3
COMM 122	Public Speaking	3
		22

### Select two (2) of the following:

BOT 123-125	Comprehensive Excel Levels I-III	3
BUS 176	Computerized Accounting Applications	2
CIS 105	Introduction to Computing	3
CIS 110	Principles of Information Systems	4
		5-7

### Select one (1) of the following:

BUS 110	Introduction to Business	3
BUS 121	Managerial Accounting	4
BUS 146	Marketing	3
BUS 154	Diversity in the Workplace	3
BUS 157	Principles of Leadership	3
BUS 159	Management Internship	3
BUS 195	Family Income Management	3
ECON 120	Principles of Macroeconomics	3
		3-4

Total Required 30-33  
Plus General Education Requirements

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Management. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## MATHEMATICS (Major Code: 50035)

Since jobs requiring mathematical skills such as data analysis, problem solving, pattern recognition, statistics, and probability are growing at nearly double the rate of overall employment, the mathematics major may benefit both educationally and economically from developing and pursuing an interest in mathematics. Mathematical skills and statistical methods are employed regularly by researchers testing hypotheses, by workers applying quality control in manufacturing, and by informed citizens who must evaluate information from the media in tabular, graphical, and report form in order to reach solutions. This major offers a foundation in these necessary skills. The emphasis is to prepare students for transfer to a four-year institution and/or for career preparation in a vocational or professional field.

### CAREER OPPORTUNITIES

- \*Accountant
- \*Actuary
- Air Traffic Controller
- \*Auditor
- †Bank Officer
- \*Budget Analyst
- Computer Operator
- \*Computer Programmer
- †Cost Estimator
- †Credit and Collection Manager
- Data Processing Manager
- \*Economist
- \*Engineer
- \*Financial Planner
- Insurance Agent/Broker
- Insurance Claim Examiner
- Laboratory Examiner
- Loan Officer
- \*Market Research Analyst
- \*Mathematician
- \*Mathematics Teacher
- \*Securities Trader
- Semiconductor Technician
- \*Statistician
- \*Systems Analyst
- Surveyor

\*Bachelor Degree or higher required

†Bachelor Degree normally recommended

### Associate in Science Degree Requirements:

<i>Course</i>	<i>Title</i>	<i>Units</i>
MATH 180	Analytic Geometry and Calculus I	5
MATH 280	Analytic Geometry and Calculus II	4
MATH 281	Intermediate Calculus	4
MATH 284	Linear Algebra	3
		16

### Select one (1) of the following:

MATH 245	Discrete Math	3
MATH 285	Differential Equations	3
		3

### Select one (1) of the following:

ENGR 120	Engineering Computer Applications	3
MATH 160	Elementary Statistics	3
PHYC 190	Mechanics and Heat	5
PHYC 200	Electricity and Magnetism	5
PHYC 210	Wave Motion and Modern Physics	5
		3-5

Total Required 22-24  
Plus General Education Requirements

(continued on next page)

Mathematics (continued)

**Recommended Electives:**

Students planning to transfer to a four-year institution to complete a bachelor's degree in Pure Mathematics, Applied Mathematics, or Statistics should emphasize in an applied discipline such as Accounting, Chemistry, Computer Science, Economics, Engineering, or Physics. In particular, transfer students are STRONGLY urged to elect the following Physics courses: PHYC 190, 200, 210. Students preparing for a vocational or professional career are strongly encouraged to emphasize in a vocational/professional discipline such as Business, Computer and Information Science, CADD Technology, Electronics Technology, or Environmental Technology.

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Mathematics. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**MUSIC EDUCATION** (Major Code: 59404)

This degree program offers lower division preparation for students who want to pursue a bachelor's degree in music education and a California teaching credential in music. The primary emphasis is to prepare students for transfer to four-year music education programs.

**CAREER OPPORTUNITIES**

- \*Arranger
- \*Choral Director
- \*Composer
- \*Conductor
- Copyist
- \*Critic
- Instrumentalist
- \*Music Instructor/Professor
- \*Music Librarian
- \*Music Therapist
- Music Typographer
- Performer, Vocalist
- Radio Programmer
- Recording Company Representative
- \*Teacher
- \*Bachelor Degree or higher required

**Associate in Arts Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
MUS 105	Music Theory and Practice I	4
MUS 106	Music Theory and Practice II	4
MUS 110	Great Music Listening	3
MUS 116	Introduction to World Music	3
MUS 120	Introduction to Music Technology	3
MUS 126	Class Guitar I	2
MUS 132	Class Piano I	3
MUS 133	Class Piano II	3
MUS 170	Class Voice	2
MUS 190	Performance Studies	1
MUS 191	Performance Studies	1
MUS 232	Class Piano III	3
MUS 233	Class Piano IV	3
MUS 290	Performance Studies	1
MUS 291	Performance Studies	1
		37

**Select four (4) units from the following:**

MUS 108	Instrumental Music Ensemble	1
MUS 109	Instrumental Music Ensemble	1
MUS 136	Chamber Singers	1
MUS 137	Chamber Singers	1
MUS 156	Jazz Ensemble	1
MUS 157	Jazz Ensemble	1
MUS 158	Chorus	1
MUS 159	Chorus	1
MUS 208	Instrumental Music Ensemble	1
MUS 209	Instrumental Music Ensemble	1
MUS 236	Chamber Singers	1
MUS 237	Chamber Singers	1
MUS 256	Jazz Ensemble	1
MUS 257	Jazz Ensemble	1
MUS 258	Chorus	1
MUS 259	Chorus	1
Total Required		41
Plus General Education Requirements		

**ORNAMENTAL HORTICULTURE**

This degree program provides for entry level skills, upgrading of existing skills, and preparation for further training. Designed for students interested in careers in nursery and greenhouse management, landscape design and construction, grounds management, retail nursery operations, irrigation system design, installation and maintenance of interior plantscaping, arboriculture and other related fields. Emphasis is on hands-on experience with student participation in labs. Students learn modern horticultural methods and procedures as well as the use of tools and equipment common to the field.

**CAREER OPPORTUNITIES**

- †Agricultural Inspector
- \*Agricultural Researcher
- †Arboretum/Park Director
- Arboriculture Technician
- Botanical Illustrator
- †County/State Agricultural Advisor
- \*Environmental Designer
- Floral Designer
- Flower Shop Manager
- Golf Course Superintendent
- Golf Course Worker
- Greenhouse Manager
- Grounds Maintenance Manager
- Grower/Production Manager
- †Horticultural Journalist
- Irrigation Consultant
- \*Landscape Architect
- Landscape Design
- Landscape Technician
- Nursery/Garden Center Manager
- †Park Planner/Manager
- Plant Breeder/Propagator
- Sports Field Manager
- Turf Manager
- Water Auditor
- †Water Conservationist
- \*Bachelor Degree or higher required.
- †Bachelor Degree normally recommended.



**I. ARBORICULTURE (Major Code: 59515)**

This major encompasses urban forestry, professional tree care and tree trimming. Students will learn care and pruning of landscape trees, palms and related plants as well as common fruit trees. Coursework includes skill development in tree climbing and pruning techniques, basic tree maintenance and principles of urban forestry. Graduates are employed by private tree care companies, public agencies or may be self-employed.

**Associate in Science Degree Requirements:**

Course	Title	Units
OH 120	Fundamentals of Ornamental Horticulture	3
OH 130	Plant Pest Control	3
OH 140	Soils	3
OH 170	Plant Materials: Trees and Shrubs	3
OH 260	Arboriculture	3
OH 261	Tree Surgery and Specialized Pruning Techniques	1
OH 262	Arboriculture: Palms and Related Plants	1
OH 263	Urban Forestry	1
OH 275	Diagnosing Horticultural Problems	1.5
OH 290*	Cooperative Work Experience Education	3
		<u>22.5</u>

**Select eleven (11) units from the following:**

OH 102	Xeriscape: Water Conservation in the Landscape	2
OH 172	Introduction to Landscape Design	3
OH 235	Principles of Landscape Irrigation	4
OH 276	Horticultural Equipment Repair and Maintenance	3
OH 278	Business Management for Ornamental Horticulture	3
SPAN 120	Spanish I	5
		<u>11</u>
	Total Required	33.5
	Plus General Education Requirements	

\*Student must complete 6 units within the major at Cuyamaca College to be eligible for this course

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Arboriculture. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**II. FLORISTRY (Major Code: 59505)**

This degree program is designed as an emphasis in the ornamental horticulture major for those individuals seeking careers in the floral industry, or to upgrade their existing skills and prepare for further training. Coursework is directed toward skills, concepts, and practices used in the commercial floral industry with an emphasis on hands-on training.

**Associate in Science Degree Requirements:**

Course	Title	Units
OH 114	Floral Design I	3
OH 116	Floral Design II	3
OH 117	Wedding Design I	3
OH 120	Fundamentals of Ornamental Horticulture	3
OH 180	Plant Materials: Annuals and Perennials	3
OH 240	Greenhouse Plant Production	3
OH 290*	Cooperative Work Experience Education	3
		<u>21</u>

**Select one (1) of the following:**

OH 118	Special Occasion Floristry	3
OH 119	Wedding Design II	3
		<u>3</u>

**Select nine (9) units from the following:**

ART 120	Two-Dimensional Design	3
ART 124	Drawing I	3
ART 141	History of Western Art II: 1250 A.D. to Present Time	3
OH 118**	Special Occasion Floristry	3
OH 119**	Wedding Design II	3
OH 121	Plant Propagation	3
OH 140	Soils	3
OH 170	Plant Materials: Trees and Shrubs	3
OH 278	Business Management for Ornamental Horticulture	3
		<u>9</u>
	Total Required	33
	Plus General Education Requirements	

\* Student must complete 6 units within the major at Cuyamaca College to be eligible for this course

\*\* May not be used for credit as both an elective and as required in previous section

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Floristry. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

### III. GOLF COURSE AND SPORTS TURF MANAGEMENT (Major Code: 53016)

Students in this major pursue careers as golf course superintendents or sports turf managers. The program is intended for those wishing to enter the field as well as those that desire upgrading of existing skills. Students may also transfer to a four-year degree program in agronomy, turf management or related field. Coursework is designed to study environmentally sound solutions for the efficient production and management of golf and sports turf.

#### Associate in Science Degree Requirements:

Course	Title	Units
BUS 156	Principles of Management	3
OH 120	Fundamentals of Ornamental Horticulture	3
OH 130	Plant Pest Control	3
OH 140	Soils	3
OH 170	Plant Materials: Trees and Shrubs	3
OH 174	Turf and Ground Cover Management	3
OH 220	Landscape Construction: Concrete and Masonry	3
OH 235	Principles of Landscape Irrigation	4
OH 265	Golf Course and Sports Turf Management	3
OH 276	Horticultural Equipment Repair and Maintenance	3
OH 290*	Cooperative Work Experience Education	5
	Total Required	36
	Plus General Education Requirements	

\*Student must complete 6 units within the major at Cuyamaca College to be eligible for this course

#### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Golf Course and Sports Turf Management. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

### IV. IRRIGATION TECHNOLOGY (Major Code: 53011)

This specialized field focuses on the design, installation and management of landscape irrigation systems. The program is designed for entry level students, those seeking to upgrade existing skills, or those wishing to transfer to a four-year degree program at Cal Poly or other institution. The use of current design theory, installation techniques and management programs form the heart of the curriculum. Graduates are employed by landscape architects, irrigation consultants, landscape contractors, public agencies or are may be self-employed.

#### Associate in Science Degree Requirements:

Course	Title	Units
OH 102	Xeriscape: Water Conservation in the Landscape	2
OH 120	Fundamentals of Ornamental Horticulture	3
OH 140	Soils	3
OH 174	Turf and Ground Cover Management	3
OH 221	Landscape Construction: Irrigation and Carpentry	3
OH 235	Principles of Landscape Irrigation	4
OH 238	Irrigation System Design	3
OH 290*	Cooperative Work Experience Education	3
		24

#### Select nine (9) units from the following:

ENGR/SURV 218	Plane Surveying	4
OH 130	Plant Pest Control	3
OH 172	Introduction to Landscape Design	3
OH 200**	Introduction to Computer Aided Landscape Design	3
OH 225	Landscape Contracting	3
OH 276	Horticultural Equipment Repair and Maintenance	3
SPAN 120	Spanish I	5
		9
	Total Required	33
	Plus General Education Requirements	

\*Student must complete 6 units within the major at Cuyamaca College to be eligible for this course

\*\*May also be offered at Southwestern College as LA 200

#### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Irrigation Technology. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**V. LANDSCAPE DESIGN (Major Code: 59516)**

Courses in this major will provide students with a systematic, process oriented approach to landscape design for residential landscapes. Coursework is designed for entry level skills, upgrading of existing skills and for transfer to a four-year degree program. The curriculum is designed to investigate the current trends in landscape design with the technologies used in the construction of the projects. Graduates are employed by landscape architects, landscape contractors, public agencies or may be self-employed.

**Associate in Science Degree Requirements:**

Course	Title	Units
OH 102	Xeriscape: Water Conservation in the Landscape	2
OH 170	Plant Materials: Trees and Shrubs	3
OH 172	Introduction to Landscape Design	3
OH 173	Intermediate Landscape Design	3
OH 175	Advanced Landscape Design	3
OH 180	Plant Materials: Annuals and Perennials	3
OH 200*	Introduction to Computer Aided Landscape Design	3
OH 201**	Advanced Computer Aided Landscape Design	3
OH 220	Landscape Construction: Concrete and Masonry	3
OH 235	Principles of Landscape Irrigation	4
OH 278	Business Management for Ornamental Horticulture	3
OH 290***	Cooperative Work Experience Education	3
	Total Required	36
	Plus General Education Requirements	

\*May also be offered at Southwestern College as *LA 200*

\*\*May also be offered at Southwestern College as *LA 201*

\*\*\*Student must complete 6 units within the major at Cuyamaca College to be eligible for this course

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Landscape Design. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**VI. LANDSCAPE TECHNOLOGY (Major Code: 53001)**

Landscape installation and management forms the focus of this program. Students learn the latest methods, materials and techniques in the landscape industry. Students seeking careers in Landscape Technology are entering a challenging career field that requires knowledge of plant material, turfgrass, landscape and irrigation design, soils, pest control and landscape construction. A professional in the field has the opportunity to be involved in working with people as well as plants as the manager must direct and supervise employees, deal with clients and suppliers, and may become involved in professional organizations. Students entering the landscape industry, those already employed but seeking upgraded skills, and those wishing to transfer to Cal Poly or other four-year degree programs will benefit from the curriculum. Graduates are employed by landscape contractors, public agencies or are self-employed.

**Associate in Science Degree Requirements:**

Course	Title	Units
OH 120	Fundamentals of Ornamental Horticulture	3
OH 130	Plant Pest Control	3
OH 140	Soils	3
OH 170	Plant Materials: Trees and Shrubs	3
OH 172	Introduction to Landscape Design	3
OH 180	Plant Materials: Annuals and Perennials	3
OH 220	Landscape Construction: Concrete and Masonry	3
OH 235	Principles of Landscape Irrigation	4
OH 290*	Cooperative Work Experience Education	3
		28

**Select five (5) units from the following:**

OH 102	Xeriscape: Water Conservation in the Landscape	2
OH 173	Intermediate Landscape Design	3
OH 174	Turf and Ground Cover Management	3
OH 221	Landscape Construction: Irrigation and Carpentry	3
OH 225	Landscape Contracting	3
OH 276	Horticultural Equipment Repair and Maintenance	3
OH 278	Business Management for Ornamental Horticulture	3
SPAN 120	Spanish I	5
		5
	Total Required	33
	Plus General Education Requirements	

\*Student must complete 6 units within the major at Cuyamaca College to be eligible for this course

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Landscape Technology. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**VII. NURSERY TECHNOLOGY** (Major Code: 53002)

Students enrolled in this major pursue careers in the wholesale production and retail sales of horticultural crops. Coursework will focus on plant propagation, greenhouse plant production, and horticultural practices related to production and sales of landscape and greenhouse plant material. Students entering the nursery industry, those already employed but seeking upgraded skills, and those wishing to transfer to Cal Poly or other four-year degree programs will benefit from the curriculum. Graduates are employed by wholesale and retail nurseries, public agencies or may be self employed.

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
OH 120	Fundamentals of Ornamental Horticulture	3
OH 121	Plant Propagation	3
OH 130	Plant Pest Control	3
OH 140	Soils	3
OH 170	Plant Materials: Trees and Shrubs	3
OH 180	Plant Materials: Annuals and Perennials	3
OH 240	Greenhouse Plant Production	3
OH 290*	Cooperative Work Experience Education	3
		24

**Select nine (9) units from the following:**

BIO 122	Plant Structures and Functions	4
OH 114	Floral Design I	3
OH 172	Introduction to Landscape Design	3
OH 276	Horticultural Equipment Repair and Maintenance	3
OH 278	Business Management for Ornamental Horticulture	3
SPAN 120	Spanish I	5
		9
	Total Required	33
	Plus General Education Requirements	

\*Student must complete 6 units within the major at Cuyamaca College to be eligible for this course

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Nursery Technology. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**PARALEGAL STUDIES**

(Major Code: 59507)

The legal profession has evolved, like the medical profession, into a profession of specialties. Based on this recent development, lawyers need qualified assistants to better help them provide legal services to their clients. Paralegals are trained, professional technicians able to provide this needed legal assistance.

This degree program is specifically designed to prepare and provide students with the analytical skills and written abilities necessary to assist attorneys in the practice of law. The technical curriculum goals and objectives emphasize three primary areas:

1. Legal Research, Analysis and Writing
2. Ethics and the Mechanics of Law
3. Cooperative Work Experience

The successful paralegal degree candidate will possess a broad educational background with an opportunity to gain specialized skills in specific areas of law. The large curriculum offering also allows practicing paralegals to attend college refresher or new skills development courses.

This program does not prepare students for law school or the practice of law.

**CAREER OPPORTUNITIES**

- Claim Examiner
- Compensation and Benefits Manager
- Compliance and Enforcement Inspector
- †Contract Consultant
- Forms and Procedures Specialist
- Freelance Paralegal
- \*Labor Relations Specialist
- Law Clerk
- Legal Aide
- Legal Assistant
- Legal Research Assistant
- Legal Technician
- Occupational Safety and Health Worker
- †Paralegal
- Patent Agent
- Title Examiner

\*Bachelor Degree or higher required

†Bachelor Degree normally recommended

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
BOT 120-122	Comprehensive Word Levels I-III	3
BUS 125	Business Law: Legal Environment of Business	3
PARA 100	Introduction to Paralegal Studies	3
PARA 110	Civil Litigation Practice and Procedures	3
PARA 125	Business Organization	3
PARA 130	Legal Research and Writing	3
PARA 132	Computer Assisted Legal Research (CALR)	3
		21

**Select at least six (6) units from the following:**

PARA 120	Administrative Law	3
PARA 135	Bankruptcy Law	1
PARA 140	Criminal Law and Procedures	3
PARA 145	Estate Planning	3
PARA 150	Family Law	3
PARA 155	Insurance Law	3
PARA 160	Personal Injury	1
PARA 165	Probate Law	3
PARA 170	Worker's Compensation	1
PARA 180	Government and Public Contracts	3
PARA 250*	Internship	1-3
		6
	Total Required	27
	Plus General Education Requirements	

**Recommended Electives:**

BUS 128, ENGL 120

\*Student must complete 18 units within the major to be eligible for this course.

To fulfill G.E. requirements for the Paralegal Studies degree, select from the following:

**AREA A—LANGUAGE AND RATIONALITY**

(Minimum of 6 semester units)

This requirement is met by taking one course from each of the two areas:

**1. Written Communication:**

ENGL 110, 120

**2. Oral Communication and Analytical Thinking:**

COMM 120, 122, 137

MATH 103, 110, 120, 125, 150, 160, 170, 175, 176, 178, 180, 245, 280, 281, 284

PHIL 125, 130

PSY 215

**AREA B—NATURAL SCIENCES**

(Minimum of 4 semester units)

This requirement is met by taking a course that includes a laboratory (laboratory courses are underlined):

ANTH 130

ASTR 110, 112

BIO 112, 115, 122, 126, 128, 130, 131, 140, 152, 210, 220, 221

CHEM 115, 116, 120, 141

GEOG 120, 121

GEOL 104, 110

OCEA 112, 113

PHYC 110, 120, 121, 130, 131, 190, 200, 210

**AREA C—HUMANITIES**

(Minimum of 3 semester units)

This requirement is met by taking one of the following courses:

ARAM 120, 121, 220

ARBC 120, 121, 145, 220, 221, 250, 251

ART 100, 120, 140, 141, 144, 145

ASL 120

COMM 124, 145

ENGL 122, 201, 202, 207, 214, 217, 221, 222, 231, 232, 270, 271, 275, 276, 277

FREN 120, 121, 220, 221, 250, 251

HIST 100, 101, 105, 106, 210

HUM 110, 120, 140, 155

MUS 110, 111, 114, 115, 116, 117

PHIL 110, 115, 117, 140, 160, 170

RELG 100, 120, 130, 140, 150, 200, 210, 215

SPAN 120, 120A & 120B\*, 121, 141, 145, 220, 221, 250, 251

THTR 110, 120, 121

**AREA D—SOCIAL AND BEHAVIORAL SCIENCES**

(Minimum of 3 semester units)

This requirement is met by taking one of the following courses:

ANTH 120

CD 125

ECON 110, 120, 121

GEOG 106, 130

HED 120, 122, 201

HIST 108, 109, 114, 115, 118, 119, 122, 123, 124, 130, 131, 132, 180, 181

POSC 120, 121, 124, 130, 140

PSY 120, 125, 134, 138, 140, 165, 170, 220

SOC 120, 125, 130

**ADDITIONAL REQUIREMENTS:**

(Minimum 6 semester units)

This requirement is met by selecting two additional courses. The two courses must come from two different areas:

- Area B, Natural Sciences
- Area C, Humanities
- Area D, Social and Behavioral Sciences

\*Will receive general education credit for SPAN 120B only after completion of SPAN 120A.

NOTE: General Education course choices for transfer and the Associate Degree may differ between Cuyamaca College and Grossmont College. Each college strongly recommends that students visit the Counseling Centers for specific information if they plan to attend both campuses.

(continued on next page)



Paralegal Studies (continued)

**DEGREE REQUIREMENTS:**

Cuyamaca College will confer the Degree of Associate in Science or Associate in Arts upon students who successfully complete the following requirements:

1. A minimum of 60 semester units of college work. English composition course credit: Students may receive credit for only one English composition course below transferable freshman composition (ENGL 120) toward degree requirements.
2. Competency Requirements
  - A. Completion of ENGL 110 with a grade of "C" or better, or a grade of "CR".
  - B. Completion of MATH 103 or a higher numbered mathematics class with a grade of "C" or better, or a grade of "CR" or completion of MDTP assessment placing into a class higher than MATH 103 or 110.
3. Exercise Science Degree Requirements  
 With the exception of the University Transfer Studies degree, two activity courses in exercise science are required for graduation from Cuyamaca College. These courses are marked with an asterisk in the "Course Descriptions" section.
  - A. If medical reasons necessitate exclusion from exercise science, a medical statement must be on file with the Admissions and Records Office. Adaptive exercise science classes are available.
  - B. Veterans who have completed at least one year of honorable active service will receive two units of credit for exercise science which will satisfy the activity requirement for graduation. To receive credit for military service, a DD-214 or appropriate military records must be submitted to the Admissions and Records Office.
4. Achievement of a "C" average (2.0 GPA) in all college work counted toward degree requirements.
5. A maximum of 12 "CR" semester units taken in regular course work at this institution may be counted toward the 60 semester units required for graduation but shall not be included as part of the requirements for the major.
6. A minimum of 12 semester units of Legal Specialty courses must be completed at Cuyamaca College.

\*A grade of "CR" (Credit) represents a "C" grade or better. For more information regarding degree requirements, see "Transfer" section.

**PHYSICAL SCIENCE** (Major Code: 59508)

The physical science curriculum is designed to give students working toward a bachelor's degree a well-balanced, lower division program. Emphasizes fundamental concepts and problem solving. The degree requirements are typical of what other four-year colleges and universities require, and satisfy the requirements of San Diego State University.

**CAREER OPPORTUNITIES**

This major trains students for a wide variety of diverse professions such as teaching science, technical administration in industry and government, legal work with patents, scientific librarianship and scientific journalism.

- \*Astronomer
- Cartographic Technician
- \*Chemist
- Geodetic Technician
- \*Geologist
- \*Meteorologist
- Meteorological Technician
- \*Oceanographer
- \*Patent Lawyer
- \*Physical Science Teacher
- Physical Science Technician
- \*Physicist
- Range Technician
- Soil Conservation Technician

\*Bachelor Degree or higher required

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
ASTR 110	Descriptive Astronomy	3
CHEM 141	General Chemistry I	5
CHEM 142	General Chemistry II	5
CHEM 231	Organic Chemistry I	5
GEOL 110	General Geology	3
MATH 180	Analytical Geometry and Calculus I	5
MATH 280	Analytical Geometry and Calculus II	4
MATH 281	Intermediate Calculus	4
PHYC 190	Mechanics and Heat	5
PHYC 200	Electricity and Magnetism	5
PHYC 210	Wave Motion and Modern Physics	5
	Total Required	49
	Plus General Education Requirements	

## PHYSICS (Major Code: 59509)

Physics is the study of the relationship between matter and energy in the universe. The curriculum is designed to give students working toward a bachelor's degree a well-balanced, lower division program. Emphasizes fundamental concepts and problem solving. The degree requirements are typical of what other four-year colleges and universities require, and satisfy the requirements of San Diego State University.

### CAREER OPPORTUNITIES

- Air Pollution Operating Specialist
- \*Astronomer
- \*Astrophysicist
- \*Biomedical Engineer
- \*Biophysicist
- \*Chemical Physicist
- Consumer Safety Officer
- \*Cryogenic Engineer
- Electrician
- Food and Drug Inspector
- \*Fusion Engineer
- \*Geophysicist
- Government Claims Representative
- Health Program Representative
- \*High Energy Physicist
- Laser Specialist
- \*Metallurgist
- \*Meteorologist
- \*Nuclear Physicist
- \*Physical Oceanographer
- \*Physicist
- \*Plasma Physicist
- Quality Control Technician
- \*Quantum Physicist
- \*Seismologist

\*Bachelor Degree or higher required

### Associate in Science Degree Requirements:

Course	Title	Units
CHEM 141	General Chemistry I	5
CHEM 142	General Chemistry II	5
MATH 180	Analytical Geometry and Calculus I	5
MATH 280	Analytical Geometry and Calculus II	4
MATH 281	Intermediate Calculus	4
PHYC 190	Mechanics and Heat	5
PHYC 200	Electricity and Magnetism	5
PHYC 210	Wave Motion and Modern Physics	5
	Total Required	38
	Plus General Education Requirements	

## REAL ESTATE

### I. REAL ESTATE (Major Code: 50043)

This degree program is designed to prepare students for employment in real estate or related fields. It also meets the educational requirements for the California Real Estate Broker's License and helps prepare both the salesperson and broker for the state examination. Most real estate classes also meet educational requirements for appraisal licensing.

### CAREER OPPORTUNITIES

- Agent
- †Appraiser
- Broker
- Builder/Developer
- \*Economist
- Escrow Officer/Trust Manager
- Investor
- Lender/Financial Institution
- Property Manager
- Salesperson
- Title Officer

\*Bachelor Degree or higher required

†Office of Real Estate Appraisal License required

### Associate in Science Degree Requirements:

Course	Title	Units
RE 190	Real Estate Principles	3
RE 191	Real Estate Practice	3
RE 192	Real Estate Finance	3
RE 193	Real Estate Legal Aspects	3
RE 194	Real Estate Appraisal	3
		<hr/> 15

### Select three (3) of the following including one Accounting or Economics course:

BUS 110*	Introduction to Business	3
BUS 120	Financial Accounting	4
ECON 110	Economic Issues and Policies	3
	<b>or</b>	
ECON 120	Principles of Macroeconomics	3
	<b>or</b>	
ECON 121	Principles of Microeconomics	3
	<b>or</b>	
RE 197	Real Estate Economics	3
RE 201	Real Estate Property Management	3
RE 250*	Real Estate Internship	1-4
RE 294	Advanced Real Estate Appraisal	3
	Elective (select one Elective from below)	3
		<hr/> 7-11

### Electives:

BUS 125	Business Law: Legal Environment of Business	3
RE 125	Escrow Procedures I	3
RE 202*	Business Opportunities Sales	3
RE 204	Real Estate Office Administration	3
RE 230*	Commercial Real Estate	3
RE 292	Mortgage Loan Brokering and Lending	3

Total Required 22-26  
Plus General Education Requirements

\*Non-Department of Real Estate Licensing course

(continued on next page)

Real Estate (continued)

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Real Estate. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**BROKER'S LICENSE**

Students may satisfy the California State Education requirement for a Broker's License by completing the following:

Course	Title	Units
RE 190	Real Estate Principles	3
RE 191	Real Estate Practice	3
RE 192	Real Estate Finance	3
RE 193	Real Estate Legal Aspects	3
RE 194	Real Estate Appraisal	3
One Accounting or Economics Course		3
Electives* (select two electives from previous column)		6
Total Required		24

**II. ESCROW (Major Code: 50045)**

**Certificate Requirements:**

Course	Title	Units
RE 125	Escrow Procedures I	3
RE 126	Escrow Procedures II	3
RE 127	Escrow Procedures III	3
RE 190	Real Estate Principles	3
RE 192	Real Estate Finance	3
RE 193	Real Estate Legal Aspects	3
		18

**Select two (2) of the following:**

BUS 120	Financial Accounting	4
BUS 121	Managerial Accounting	4
BUS 125	Business Law: Legal Environment of Business	3
ECON 120	Principles of Macroeconomics	3
ECON 121	Principles of Microeconomics	3
RE 191	Real Estate Practice	3
RE 194	Real Estate Appraisal	3
RE 197	Real Estate Economics	3
RE 201	Real Estate Property Management	3
RE 202	Business Opportunities Sales	3
RE 204	Real Estate Office Administration	3
		6-8
Total Required		24-26

**Certificate of Achievement**

Students who complete the requirements above qualify for a Certificate in Escrow. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**SOCIAL WORK (Major Code: 59355)**

The Social Work program offers lower division preparation for students who want to pursue a bachelor's degree in social work. The primary emphasis of the program is to prepare students for transfer to four-year social work programs.

**CAREER OPPORTUNITIES**

- \*Administration
- \*Child Welfare
- Clinical:
  - \*Counseling, Therapy
- Community Organizations:
  - \*Advocacy, Politics, Education
- \*Criminal Justice/Corrections
- \*Developmental Disabilities
- \*Gerontology
- \*Health Care
- Occupational:
  - \*Counseling
  - \*Organizational Development
  - \*Teaching
  - \*Wellness Promotion
  - \*Human Resources
- Public Welfare:
  - \*Social Work
- \*Research

\*Bachelor degree or higher recommended

**Associate in Arts Degree Requirements:**

Course	Title	Units
BIO 130	General Biology I	3
ECON 110	Economic Issues and Policies	3
<b>or</b>		
ECON 120	Principles of Macroeconomics	3
<b>or</b>		
ECON 121	Principles of Microeconomics	3
HED 120	Personal Health and Lifestyles	3
MATH 160	Elementary Statistics	3
<b>or</b>		
PSY 215	Statistics for the Behavioral Sciences	3
<b>or</b>		
BIO 215	Statistics for Life Sciences	3
PSY 120	Introductory Psychology	3
SOC 120	Introductory Sociology	3
SW 110	Social Work Fields of Service	3
SW 120	Introduction to Social Work	3
Total Required		24
Plus General Education Requirements		

## SPANISH (Major Code: 54049)

This degree program is designed to provide students with communicative skills in understanding, speaking, reading, and writing Spanish. It also gives students a greater understanding of Spanish culture and civilization, and prepares them for greater international and domestic career opportunities. For the suggested sequence of courses to be taken and/or assistance in transferring to a four-year institution, students should consult the Counseling Center or the Department of Foreign Languages.

### CAREER OPPORTUNITIES

Bilingual Aide  
 Border Patrol Officer  
 Buyer  
 Court Interpreter  
 Counseling  
 Customs Agent/Inspector  
 Foreign Exchange Clerk  
 \*Foreign Student Advisor  
 Interpreter  
 \*Journalist  
 \*Museum Curator  
 \*Physician  
 \*Scientific Linguist  
 Tour Guide  
 Tutor

\*Bachelor Degree or higher required

### Associate in Arts Degree Requirements:

Course	Title	Units
SPAN 120	Spanish I	5
<b>or</b>		
SPAN 120A	Spanish I	2.5
<b>and</b>		
SPAN 120B	Spanish I	2.5
SPAN 121	Spanish II	5
SPAN 220	Spanish III	5
SPAN 221	Spanish IV	5
SPAN 250	Conversational Spanish	3
SPAN 251	Conversational Spanish	3
		26

### Select one (1) of the following:

HIST 118	U.S. History: Chicano/Chicana Perspectives I	3
HIST 119	U.S. History: Chicano/Chicana Perspectives II	3
SPAN 141	Spanish and Latin American Cultures	3
SPAN 145	Hispanic Civilizations	3
		3
	Total Required	29
	Plus General Education Requirements	

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Spanish. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## SURVEYING (Major Code: 53091)

This degree program prepares students to enter the civil engineering field. Competency in care and operation of field instruments, solution of problems in the laboratory, drafting of land survey maps and civil engineering plans, and application of studies to field practice are thoroughly explored.

### CAREER OPPORTUNITIES

Geodetic Surveyor  
 Geophysical Prospecting Surveyor  
 Instruments Surveyor Assistant  
 Land Surveyor  
 Marine Surveyor  
 Mine Surveyor  
 Oil-Well Directional Surveyor

### Associate in Science Degree Requirements:

Course	Title	Units
CADD 115	Engineering Graphics	3
<b>or</b>		
ENGR 100	Introduction to Engineering and Engineering Graphics	2
CADD 120ABCD	Basic CAD	3
CADD 127	Survey Drafting Technology	3
MATH 170	Analytic Trigonometry	3
PHYC 110	Introductory Physics	4
SURV 218	Plane Surveying	4
<b>or</b>		
ENGR 218	Plane Surveying	4
SURV 220	Boundary Control and Legal Principles	3
SURV 240	Advanced Surveying	4
	Total Required	26-27
	Plus General Education Requirements	

### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Surveying. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

## UNIVERSITY TRANSFER STUDIES

This degree is designed for students who plan to transfer to the California State University or the University of California. To receive the University Studies Transfer Associate Degree, a student must complete ONE of four General Education transfer patterns: the CSU General Education Breadth, the Intersegmental General Education Transfer Curriculum (IGETC) for CSU or UC, **or** the Transfer Admission Guarantee (TAG) requirements for the University of California, San Diego. Although the degree recognizes the completion of lower division general education requirements, it does not guarantee admission to a four-year institution. Some majors and schools require a higher GPA than is necessary for the Associate Degree.

### I. CSU General Education Breadth (Major Code: 58501)

To meet requirements of the CSU General Education Breadth program, students must:

1. Complete CSU General Education Breadth for Certification pattern (see Transfer Information and Degree Requirements).
2. Earn a grade of "C" or better (or CR) in 30 semester units of general education to include all courses in Area A and the Mathematical/Quantitative Reasoning course in Area B.
3. Complete a minimum of 60 degree applicable CSU transferable semester units.
4. Earn a cumulative GPA of 2.0 in all college coursework completed.
5. Meet Cuyamaca College residency requirements for graduation (see Admission Information).

### II. Intersegmental General Education Transfer Curriculum (IGETC) for CSU (Major Code: 58502)

To meet requirements of the IGETC for CSU program, students must:

1. Complete the IGETC Certification pattern (see Transfer Information and Degree Requirements).
2. Earn a grade "C" or better (or CR) in all IGETC courses.
3. Complete a minimum of 60 degree applicable CSU transferable semester units.
4. Earn a cumulative GPA of 2.0 in all college coursework completed.
5. Meet Cuyamaca College residency requirements for graduation (see Admission Information).

### III. Intersegmental General Education Transfer Curriculum (IGETC) for UC (Major Code: 58503)

To meet requirements of the IGETC for UC program, students must:

1. Complete the IGETC Certification pattern (see Transfer Information and Degree Requirements).
2. Earn a grade of "C" or better (or CR) in all IGETC courses.
3. Complete a minimum of 60 degree applicable UC transferable semester units.
4. Earn a cumulative GPA of 2.0 in all college coursework completed.
5. Meet Cuyamaca College residency requirements for graduation (see Admission Information).

### IV. Transfer Admission Guarantee (TAG) Requirements for the University of California, San Diego (Major Code: 58504)

To meet requirements of the UCSD TAG program, students must:

1. Complete the TAG core requirements (see Transfer Information and Degree Requirements).
2. Complete a minimum of 60 degree applicable UC transferable semester units.
3. Meet minimum grade standards of the UCSD TAG agreement.
4. Meet Cuyamaca College residency requirements for graduation (see Admission Information).

It is **STRONGLY** recommended that lower division preparation for the major be completed at the community college prior to transfer and be incorporated into the 60 unit degree plan. Please meet with a counselor to determine lower division major preparation since requirements change and can be complex.



## WATER/WASTEWATER TECHNOLOGY

This degree program is designed to prepare students for employment by municipal drinking water and wastewater treatment departments or industrial treatment facilities. Careers in Water/Wastewater Technology generally involve the administration, operation and maintenance of both drinking water and wastewater treatment facilities as well as distribution and collection systems.

### CAREER OPPORTUNITIES

Backflow Program Manager  
 \*Chemist  
 Construction Inspector  
 Cross Connection Control Specialist  
 Electronic Technician  
 \*Engineer, Civil  
 \*Engineer, Electrical  
 Engineer Technician  
 Equipment Maintenance Operator  
 Field Operations Supervisor  
 GIS/Mapping Specialist  
 Inspector  
 Instrumentation and Control Technician  
 Instrumentation and Control Supervisor  
 Laboratory Analyst  
 Machinist  
 Mechanical Systems Technician  
 Meter Maintenance Technician  
 Plant Operator  
 Plant Process Control Electrician  
 Plant Process Control Supervisor  
 Recycled Water Inspector  
 \*Safety and Risk Manager  
 Survey Technician  
 Utility Worker  
 Wastewater Plant Operator  
 Wastewater Treatment Superintendent  
 \*Water Distribution Operator  
 \*Water Quality and Treatment Manager  
 Water Systems Technician

\*Bachelor Degree recommended

### I. CROSS CONNECTION CONTROL SYSTEMS

(Major Code: 51063)

#### Associate in Science Degree Requirements:

Course	Title	Units
WWTR 101	Fundamentals of Water/Wastewater Technology	3
WWTR 102	Calculations in Water/Wastewater Technology	3
WWTR 104	Applied Hydraulics	3
WWTR 130	Water Distribution Systems	3
WWTR 280	Backflow Tester Training	2
WWTR 282	Cross Connection Control Specialist	3
WWTR 284	Cross Connection Control Specialist—Recycled Water	3
		<hr/> 20

#### Select eight to ten (8-10) units from the following:

ENVT 100	Introduction to Environmental and Occupational Safety and Health (OSH) Technology	4
ENVT 110	Pollution Prevention	3
ENVT 210	Industrial Wastewater and Stormwater Management	4
WWTR 110	Laboratory Analysis for Water/Wastewater	3
WWTR 290	Cooperative Work Experience	3
		<hr/> 8-10
	Total Required	28-30
	Plus General Education Requirements	

#### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Cross Connection Control Systems. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

### II. WATER DISTRIBUTION SYSTEMS

(Major Code: 51064)

#### Associate in Science Degree Requirements:

Course	Title	Units
WWTR 101	Fundamentals of Water/Wastewater Technology	3
WWTR 102	Calculations in Water/Wastewater Technology	3
WWTR 104	Applied Hydraulics	3
WWTR 106	Introduction to Electrical and Instrumentation Processes	3
WWTR 130	Water Distribution Systems	3
WWTR 134	Mechanical Maintenance	3
WWTR 265	Water Distribution Systems II	3
		<hr/> 21

#### Select eight to nine (8-9) units from the following:

ENVT 100	Introduction to Environmental and Occupational Safety and Health (OSH) Technology	4
ENVT 110	Pollution Prevention	3
ENVT 210	Industrial Wastewater and Stormwater Management	4
WWTR 112	Basic Plant Operations: Water Treatment	3
WWTR 270	Public Works Supervision	3
WWTR 280	Backflow Tester Training	2
WWTR 282	Cross Connection Control Specialist	3
WWTR 284	Cross Connection Control Specialist—Recycled Water	3
WWTR 290	Cooperative Work Experience	3
		<hr/> 8-9
	Total Required	29-30
	Plus General Education Requirements	

#### Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Water Distribution Systems. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**III. WATER TREATMENT PLANT OPERATOR**  
(Major Code: 51060)

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
WWTR 101	Fundamentals of Water/Wastewater Technology	3
WWTR 102	Calculations in Water/Wastewater Technology	3
WWTR 104	Applied Hydraulics	3
WWTR 106	Introduction to Electrical and Instrumentation Processes	3
WWTR 110	Laboratory Analysis for Water/Wastewater	3
WWTR 112	Basic Plant Operations: Water Treatment	3
WWTR 117	Advanced Plant Operations: Water Treatment	3
		21

**Select one (1) of the following:**

WWTR 114	Basic Plant Operations: Wastewater Treatment	3
WWTR 130	Water Distribution Systems	3
WWTR 132	Wastewater Collection Systems	3
WWTR 134	Mechanical Maintenance	3
WWTR 270	Public Works Supervision	3
WWTR 290	Cooperative Work Experience	3
		3

**Select two (2) of the following:**

ENVT 100	Introduction to Environmental and Occupational Safety and Health (OSH) Technology	4
ENVT 110	Pollution Prevention	3
ENVT 210	Industrial Wastewater and Stormwater Management	4
WWTR 280	Backflow Tester Training	2
WWTR 282	Cross Connection Control Specialist	3
		5-8
	Total Required	29-32
	Plus General Education Requirements	

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Water Treatment Plant Operator. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**IV. WASTEWATER COLLECTION SYSTEMS**  
(Major Code: 51065)

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
WWTR 101	Fundamentals of Water/Wastewater Technology	3
WWTR 102	Calculations in Water/Wastewater Technology	3
WWTR 104	Applied Hydraulics	3
WWTR 106	Introduction to Electrical and Instrumentation Processes	3
WWTR 132	Wastewater Collection Systems	3
WWTR 134	Mechanical Maintenance	3
WWTR 267	Wastewater Collection Systems II	3
		21

**Select eight to nine (8-9) units from the following:**

ENVT 100	Introduction to Environmental and Occupational Safety and Health (OSH) Technology	4
ENVT 110	Pollution Prevention	3
ENVT 210	Industrial Wastewater and Stormwater Management	4
WWTR 114	Basic Plant Operations: Wastewater Treatment	3
WWTR 270	Public Works Supervision	3
WWTR 280	Backflow Tester Training	2
WWTR 282	Cross Connection Control Specialist	3
WWTR 284	Cross Connection Control Specialist- Recycled Water	3
WWTR 290	Cooperative Work Experience	3
		8-9
	Total Required	29-30
	Plus General Education Requirements	

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Wastewater Collection Systems. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**V. WASTEWATER TREATMENT OPERATOR**

(Major Code: 51061)

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
WWTR 101	Fundamentals of Water/Wastewater Technology	3
WWTR 102	Calculations in Water/Wastewater Technology	3
WWTR 104	Applied Hydraulics	3
WWTR 106	Introduction to Electrical and Instrumentation Processes	3
WWTR 110	Laboratory Analysis for Water/Wastewater	3
WWTR 114	Basic Plant Operations: Wastewater Treatment	3
WWTR 120	Advanced Plant Operations: Wastewater Treatment	3
		21

**Select one (1) of the following:**

WWTR 112	Basic Plant Operations: Water Treatment	3
WWTR 130	Water Distribution Systems	3
WWTR 132	Wastewater Collection Systems	3
WWTR 134	Mechanical Maintenance	3
WWTR 270	Public Works Supervision	3
WWTR 290	Cooperative Work Experience	3
		3

**Select two (2) of the following:**

ENVT 100	Introduction to Environmental and Occupational Safety and Health (OSH) Technology	4
ENVT 110	Pollution Prevention	3
ENVT 210	Industrial Wastewater and Stormwater Management	4
WWTR 280	Backflow Tester Training	2
WWTR 282	Cross Connection Control Specialist	3
		5-8
	Total Required	29-32
	Plus General Education Requirements	

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Wastewater Treatment Operator. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.