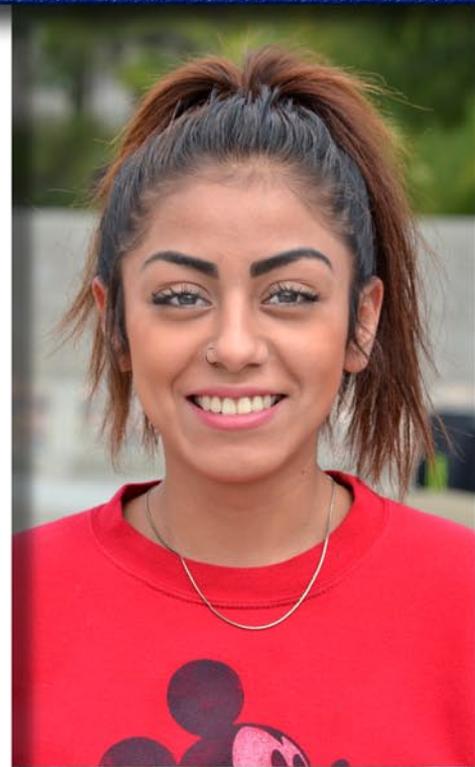


CUYAMACA COLLEGE

2018-2019 CATALOG  
- ADDENDUM -



CELEBRATING  
**40**  
YEARS OF  
EXCELLENCE





C U Y A M A C A  
· C O L L E G E ·

# Addendum to the 2018-2019 Catalog

Additions, Modifications and Corrections occurring after publication of the Catalog (June 28, 2018). **Unless otherwise noted, all Additions, Modifications and Corrections are effective Fall 2018.**

February 12, 2019

**Inside Front Cover & Page: 3**

**Comments:**

Revised Governing Board Members^ & Administrators#Δ°

**GROSSMONT-CUYAMACA COMMUNITY COLLEGE DISTRICT GOVERNING BOARD**

Elena Adams, Linda Cartwright^, Bill Garrett, Debbie Justeson, Brad Monroe^

**CUYAMACA COLLEGE ADMINISTRATION**

Julianna Barnes, Ed.D. ....	President
Sahar Abushaban .....	Vice President, Administrative Services
Patrick Setzer .....	Vice President, Instruction
Jessica Robinson, Ed.D. ....	Vice President, Student Services
Brianna Hays .....	Senior Dean, Institutional Effectiveness, Success & Equity
Alicia Muñoz .....	Dean, Arts, Humanities & Social Sciences (Art, American Sign Language, Communication, English, English as a Second Language, History, Social and Behavioral Sciences, Humanities, Philosophy and Religious Studies, Performing Arts, World Languages)
Terry Davis° .....	Interim Dean, Athletics, Kinesiology & Health Education (Kinesiology/Fitness Center, Health Education)
Larry McLemore .....	Dean, Career & Technical Education (Automotive Technology, Business and Professional Studies, Center for Water Studies, Child Development, CADD Technology & Surveying, CIS & Graphic Design, Environmental Health & Safety Management, Ornamental Horticulture)
Nicole Jones .....	Dean, Counseling Services
Kerry Kilber Rebman .....	Dean, Learning & Technology Resources
Pamela Kersey, Ed.D. ....	Dean, Math, Science & Engineering (Mathematical Sciences, Science/Engineering)
Lauren Vaknin, Ed.D. ....	Dean, Student Affairs
Jesús Miranda .....	Associate Dean, Student Equity & Engagement
Agustín Orozco .....	Associate Dean, Student Services and Special Programs
Gregory Vega .....	Director, Admissions & Records
Francisco Gonzalez# .....	Interim Director, Campus Facilities, Operations & Maintenance
Ray Reyes .....	Director, Financial Aid
John Escobedo, Ph.D. ....	Director, Title V Activities
Michael Gilchrist .....	Manager, Campus Bookstore
Richard CamposΔ .....	Manager, Sodexo

**GROSSMONT-CUYAMACA COMMUNITY COLLEGE DISTRICT ADMINISTRATION**

Cindy L. Miles, Ph.D. ....	Chancellor
Sue Rearic .....	Vice Chancellor, Business Services
Tim Corcoran .....	Vice Chancellor, Human Resources
Sean Hancock, Ed.D.# .....	Vice Chancellor, Student and Institutional Success
Todd McDonald° .....	Associate Vice Chancellor, Business Services
Craig Leedham, Ph.D.Δ .....	Associate Vice Chancellor, Human Resources
Christopher Tarman .....	Associate Vice Chancellor, Research, Planning & Technology
Linda Bertolucci .....	Sr. Director, Purchasing, Contracts & Ancillary Services
Ken Emmons .....	Sr. Director, Districtwide Facilities
Jennifer Fujimoto .....	Sr. Director, Fiscal Services
Nicole Conklin .....	Director, Public Safety
Anne Krueger .....	Director, Communications & Public Information
Myra Lomahan# .....	Interim Director, Community & Workforce Development
Jerry Williamson .....	Director, Computer Services
Michael Carr° .....	Director, Enterprise Systems
Alyssa Brown, Ed.D.Δ .....	Director, Human Resources
Janet Snelling .....	Director, Human Resources
Daniel Ciesla° .....	Director, Payroll
Steve Abat .....	Director, Technical Services
Sally Cox .....	Chief Executive Officer, Foundation for Grossmont & Cuyamaca Colleges
Dana Rivers .....	Director of Development, Foundation for Grossmont & Cuyamaca Colleges
Chito Gutierrez .....	Director of Operations, Foundation for Grossmont & Cuyamaca Colleges
TBDΔ .....	GCCCD Sheriff's Team Sergeant

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**Comments:**

Revisions made to California College Promise Grant#

## FINANCIAL AID PROGRAMS

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### GRANTS

#### California College Promise Grant (formerly the Board of Governor's fee waiver)

The promise grant is a state program that waives the enrollment fee for students who are residents of California (or are eligible under AB540 or AB 1899) and have financial need. Students will be considered for a promise grant as part of the financial aid application process and may apply by completing a financial aid application (FAFSA or California Dream Act application). **Please note that refunds are not retroactive to a prior semester.**

#### Minimum requirements for maximum success.

Once you've qualified for the fee waiver, it's important to ensure that you're meeting the academic and progress standards in order to avoid losing the fee waiver.

#### Academic – Sustain a GPA of 2.0 or higher

If your cumulative GPA falls below 2.0 for two consecutive primary terms (fall/spring semesters, or fall/winter/spring quarters), you may lose your fee waiver eligibility.

#### Progress – Complete at least 50% of your coursework

If the cumulative number of courses you successfully complete falls below 50% in two consecutive primary terms (fall/spring semesters or fall/winter/spring quarters), you may lose your fee waiver.

#### Combination of Academic and Progress Standards

Any combination of two consecutive terms of cumulative GPA below 2.0, and/or cumulative course completion less than 50% may result in loss of fee waiver eligibility.

#### How to regain eligibility.

If you lose eligibility for the fee waiver, there are a few ways that you can have it reinstated:

- Improve your GPA or Course Completion measures to meet the academic and progress standards.
- Successful appeal regarding extenuating circumstances.
- Not attending your school district for two consecutive primary terms.

The appeals process for extenuating circumstances includes:

- Verified accidents, illness or other circumstances beyond your control
- Changes in economic situation
- Evidence of inability to obtain essential support services
- Special consideration factors for CalWORKs, EOPS, DSPS.

- Disability accommodations not received in a timely manner.

Students appeal through the Admissions & Records Office.

Please note that foster youth and former foster youth (age 24 years and younger) are not subject to loss of the fee waiver under these regulations.

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**Comments:**

Updated the Program Learning Outcomes; added BOT 174, Computer Concepts and Applications to the requirements; removed CIS 105, Introduction to Computing from the requirements.Δ

**ACCOUNTING**

**BOOKKEEPING CERTIFICATE**

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.

**Program Learning Outcomes**

Upon successful completion of this certificate, students will be able to:

- Apply bookkeeping concepts, principles, standards and processes.
- Demonstrate information technology skills as they apply to today's business environment to solve business problems and to communicate those solutions.
- Use personal and ethical frameworks to respond to ethical dilemmas.

**Certificate Requirements:**

Course	Title	Units
BOT 123-125	Comprehensive Excel Levels I-III	3
BOT 174	Computer Concepts and Applications	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
<b>Total Required</b>		<b>20-21</b>

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.

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**Comments:**

(Effective Spring 2019)

Revisions made to the Program Learning Outcomes. ART 149, History of Graphic Design, ART 177, Digital Drawing and Painting, ART 230, Figure Drawing I, and GD 125, Typography courses added to the major requirements; other courses added as elective options ART 121, Painting I, GD 210, Professional Digital Photography I, GD 217, WEB Graphics, GD 222, WEB Animation, and GD 225, Digital Illustration. ART 125, Drawing II course removed from the major requirements.°

**ART**

**ART AND DESIGN (formerly ART-GRAPHIC DESIGN)**

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; please 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.*

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Use the vocabulary of the visual arts to express their observations as they perceive and respond to works of art, objects in nature, events, and the environment;
- Apply artistic processes and skills, using a variety of media to communicate meaning and intent in original works of art;
- Analyze the role and development of the visual arts in past and present cultures throughout the world, noting human diversity as it relates to the visual arts and artists;
- Analyze, assess, and derive meaning from works of art, including their own, according to the elements of art, the principles of design, and aesthetic qualities;

- Apply what they learn in the visual arts across subject areas; develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills; and identify careers in and related to the visual arts.

**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 124	Drawing I	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: Circa 1250 A.D. to Present Time	3
ART 149	History of Graphic Design	3
ART 177	Digital Drawing and Painting	3
ART 230	Figure Drawing I	3
ART 241	Illustration I	3
GD 105	Fundamentals of Digital Media	3
GD 110	Graphic Design Principles	3
GD 125	Typography	3
GD 126	Adobe Photoshop Digital Imaging	3
		<b>39</b>

**Select one of the following:**

ART 121	Painting I	3
ART 242	Illustration II	3
GD 130	Professional Business Practices	3
GD 210	Professional Digital Photography I	3
GD 217	WEB Graphics	3
GD 222	WEB Animation	3
GD 225	Digital Illustration	3
<b>Total Required</b>		<b>42</b>
<b>Plus General Education Requirements</b>		

**Recommended Electives:** ART 135, BUS 110, GD 230

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**Comments:**

(Effective Spring 2019)

Revisions made to the catalog description and Program Learning Outcomes. AUTO 191ABCDE, AUTO 192ABCD, AUTO 193ABC, AUTO 195ABCD, and AUTO 196ABCD courses added to the major requirements. AUTO 141, Emission Control License Fundamentals Level I Inspector Training, and AUTO 142 Emission License Procedures Level II Inspector Training courses removed from the major requirements.°

**AUTOMOTIVE TECHNOLOGY**

**AUTOMOTIVE TECHNOLOGY–FORD ASSET**

The Ford sponsored Automotive Student Service Education Training (ASSET) degree and certification program offers a unique job training opportunity to those students who are sponsored by a Ford dealership. The training includes all major content areas of Ford hybrid, electric, diesel, gasoline, alternative fuels and light and heavy trucks. In addition, students will be required to further their studies in a sponsoring dealership. Work experience classes can be used by a student to demonstrate competency and efficiency performing prescribed tasks for certification. Students seeking an associate's degree who test low in English, reading or math assessment scores 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 and Ford ASSET major credit requirements. Furthermore, students may use previous military training, automotive classes from accredited colleges, trade schools, or manufacturers training for credit by examination, please see a counselor or the department coordinator.

There are two pathways: Traditional Face-to-Face and Distance Education.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Independently diagnose Ford vehicles at a Ford dealership using knowledge skills and abilities demonstrating the proper use of tools, the workshop manual, and service information systems.

- Effectively repair various mechanical and electronic systems and subsystems using the Ford symptom to system to component to cause (SSCC) process.
- Communicate throughout the repair process with dealership and Ford personnel properly describing the diagnosis and repair processes according to state and federal regulations.
- Comply with federal and state pollution and safety regulations ensuring Ford Motor Company standards of ethics are demonstrated.

**Associate in Science Degree Requirements:**

Course	Title	Units
AUTO 190	ASSET–Orientation, PDI and Lubrication	2
AUTO 191	ASSET–Brakes, Advanced Brakes, Suspension and NVH	7
<b>or</b>		
AUTO 191ABCDE	ASSET-Brakes <b>and</b> ASSET-Brakes, Advanced Brakes, Steering and Suspension, NVH TEST OUT <b>and</b> ASSET-Dynamic Vehicle Brakes <b>and</b> Suspension <b>and</b> Noise Vibration Harshness	4.5
AUTO 192	ASSET–Drive Train	8
<b>or</b>		
AUTO 192ABCD	ASSET-Automatic Transmission Service <b>and</b> ASSET-Transmission Diagnosis and Service TEST OUT <b>and</b> ASSET-Automatic Transmission Diagnosis <b>and</b> ASSET-Differential & 4WD Diagnosis & Service	5.5
AUTO 193	ASSET–Engine Repair	4.5
<b>or</b>		
AUTO 193ABC	ASSET-Engine Diagnosis and Repair <b>and</b> ASSET-Engine Diagnosis and Repair TEST OUT <b>and</b> ASSET-Diesel Engine Performance & Diagnosis	4.5
AUTO 195	ASSET–Electronic Engine Controls	7
<b>or</b>		
AUTO 195ABCD	ASSET-Engine Performance Theory and Operation <b>and</b> ASSET-Engine Performance Diagnosis and Repair Test Out <b>and</b> ASSET-Engine Performance Diagnosis and Testing <b>and</b> Gasoline Turbo Direct Injection	5
AUTO 196	ASSET–Electrical, Accessories and Air Conditioning	5
<b>or</b>		
AUTO 196ABCD	ASSET-Electrical <b>and</b> ASSET-Electrical, Electronics, Climate Control TEST OUT <b>and</b> ASSET-Electronics <b>and</b> ASSET-Climate Control	5.5
AUTO 197*	ASSET–Work Experience	12
		Total Required 38.5-46
		Plus General Education Requirements

\*Must be taken for a total of 12 units.  
Note: English and math requirements should be accomplished during the first year of enrollment. All other GE requirements should be accomplished during the second year.

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**Comments:**

Added BOT 174, Computer Concepts and Applications to the requirements; removed BOT-110, Business English and Communication, and CIS-105, Introduction to Computing from the requirements.Δ

**BUSINESS**

**BUSINESS–GENERAL**

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. The curriculum 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. The degree is designed for students who do not plan to transfer to a four-year college or university.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Apply accounting concepts and methods to interpret financial statements for evaluating the financial position and performance of organizations.
- Recognize and appropriately respond to ethical and legal concerns relating to human resource and organizational management.
- Identify and analyze business problems or opportunities and effectively communicate recommendations for courses of actions.

**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:**

Course	Title	Units
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
BUS 128	Business Communication	3
BUS 195	Principles of Money Management for Success	3
BOT 174	Computer Concepts and Applications	3
CIS 110	Principles of Information Systems	4
ECON 120	Principles of Macroeconomics	3
		Total Required 24-26
		Plus General Education Requirements

**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.

**Pages: 64-65**

**Comments:**

**I. BUSINESS OFFICE TECHNOLOGY**

Removed BOT 108, Using Calculators to Solve Business Problems and CIS 140, Databases as elective options to the requirements.Δ

**II. ADMINISTRATIVE ASSISTANT**

Removed BOT 108, Using Calculators to Solve Business Problems and BOT 131, Comprehensive PowerPoint Level III from the requirements. Added BOT 133, Adobe Acrobat for the Workplace to the requirements from the elective options requirements; removed BOT 105, Data Entry Skills from the elective options to the requirements; increased the elective options from three units to five units.Δ

**III. EXECUTIVE ASSISTANT**

Removed CIS 140, Databases and BOT 131, Comprehensive PowerPoint Level III from the requirements. Added BOT 133, Adobe Acrobat for the Workplace to the second list of elective options in the requirements.Δ

**BUSINESS OFFICE TECHNOLOGY**

**I. BUSINESS OFFICE TECHNOLOGY**

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.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Explain the basic language and concepts within the field of business office technology.
- Use computer input devices (e.g., keyboard and mouse) to properly and efficiently create and edit documents in word processing, spreadsheet, and presentation programs such as Word, Excel, and PowerPoint, and electronic communications such as email.

**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 I-II	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
BOT 174	Computer Concepts and Applications	3
BUS 128	Business Communication	3
		<u>18</u>

**Select at least six units from the following:**

BOT 119	Windows for the Information Worker	2
BOT 123-125	Comprehensive Excel Levels I-III	3
BOT 223-225	Office Work Experience	1-3
BUS 109	Elementary Accounting	3
	<b>or</b>	
BUS 120	Financial Accounting	4
BUS 156	Principles of Management	3
BUS 176	Computerized Accounting Applications	2
		<u>6</u>
	Total Required	24
	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**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Explain the basic language and concepts within the field of business office technology.
- Use computer input devices (e.g., keyboard and mouse) to properly and efficiently create and edit documents in word processing, spreadsheet, and presentation programs such as Word, Excel, and PowerPoint, and electronic communications such as email.

**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 106	Effective Job Search	1
BOT 107	Office Systems and Procedures	2
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 129-130	Comprehensive PowerPoint Levels I-II	2
BOT 118	Integrated Office Projects	1
BOT 223-225	Office Work Experience	1-3
BUS 128	Business Communication	3
		<u>16-25</u>

**Select at least five units from the following:**

BOT 103ABC	Building Keyboarding Skill I, II, III	.5
BOT 132	Google Applications for Business	3
BOT 133	Adobe Acrobat for the Workplace	1
BOT 150	Using Microsoft Publisher	1
BOT 151	Using Microsoft Outlook	1
BUS 109	Elementary Accounting	3
BUS 120	Financial Accounting	4
		<u>5</u>
	Total Required	21-30
	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**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Explain the basic language and concepts within the field of business office technology.
- Use computer input devices (e.g., keyboard and mouse) to properly and efficiently create and edit documents in word processing, spreadsheet, and presentation programs such as Word, Excel, and PowerPoint, and electronic communications such as email.

**Associate in Science Degree Requirements:**

Course	Title	Units
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
BOT 129-130	Comprehensive PowerPoint Levels I-II	2
BOT 151	Using Microsoft Outlook	1
BOT 201	Advanced Keyboarding/Document Processing	3
BOT 223-225	Office Work Experience	1-3
BUS 128	Business Communication	3
		<u>19-21</u>

**Select at least three units from the following:**

BOT 132	Google Applications for Business	3
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
		3-4

**Select at least three units from the following:**

BOT 103ABC	Building Keyboarding Skill I, II, III	.5
BOT 119	Windows for the Information Worker	2
BOT 133	Adobe Acrobat for the Workplace	1
BOT 150	Using Microsoft Publisher	1
		3
	Total Required	25-28
	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.

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**Comments:**

(Effective Spring 2019)

Associate in Science Degrees and Certificates of Achievement for Backflow & Cross-Connection Control, Water Distribution Operations, Water Resources Management, Water Treatment Plant Operations, Wastewater Collection Systems and Wastewater Treatment Operations moved from Water/Wastewater Technology to Center for Water Studies. All courses have been renumbered from WWTR prefix to CWS prefix.°

**Backflow & Cross-Connection Control;** title change and course renumbering.°

**Water Distribution Operations;** courses added to the major requirements CWS 100, Career Pathways in Water & Wastewater, CWS 107, Safety in Water & Wastewater, CWS 110, Laboratory Analysis for Water & Wastewater; other courses added as elective options CWS 132 Wastewater Collection Systems, CWS 210, Advanced Laboratory Analysis for Water & Wastewater, CWS 212 Advanced Water Treatment Plant Operations, and CWS 232, Advanced Wastewater Collection Systems; CWS 110 Laboratory Analysis for Water & Wastewater removed from elective options.°

**Water Resources Management;** course renumbering. ^

**Water Treatment Plant Operations** title change. Courses added to the major requirements CWS 100, Career Pathways in Water & Wastewater, CWS 107, Safety in Water & Wastewater, CWS 134, Pumps, Motors & Valves; other courses added as elective options CWS 210, Advanced Laboratory Analysis for Water & Wastewater, CWS 214, Advanced Wastewater Treatment Plant Operations, and CWS 230, Advanced Water Distribution Systems; WWTR 132 and WWTR 134 removed from the elective options.°

**Wastewater Collection Systems;** courses added to the major requirements CWS 100, Career Pathways in Water & Wastewater, CWS 107, Safety in Water & Wastewater; other courses added as elective options CWS 110 Laboratory Analysis for Water & Wastewater, CWS 112 Water Treatments Plant Operations, CWS 130, Water Distribution Systems, CWS 210, Advanced Laboratory Analysis for Water & Wastewater, CWS 214 Advanced Wastewater Treatment Plant Operations, CWS 230 Advanced Water Distribution Systems; CWS 105, Water Conservation, CWS 282, Cross-Connection Control Specialist removed from elective options. ^

**Wastewater Treatment Operations,** title change. Courses added to the major requirements CWS 100, Career Pathways in Water & Wastewater, CWS 107, Safety in Water & Wastewater, CWS 134, Pumps, Motors & Valves; other courses added as elective options CWS 210, Advanced Laboratory Analysis for Water & Wastewater, CWS 212, Advanced Water Treatment Plant Operations, CWS 232, Advanced Wastewater Collection Systems and CWS 284, Cross-Connection Control Specialist-Recycled Water; WWTR 105, and WWTR 134 removed from the elective options.°

# CENTER FOR WATER STUDIES

**I. BACKFLOW & CROSS-CONNECTION CONTROL**

Students will study the technical processes, procedures, and methods used in the production, use, and distribution of recycled and reclaimed wastewater, including backflow protection, legal, administrative and permitting issues, the treatment process, health and safety concerns, and the cross-connection control (shut down) test as performed in San Diego County. The courses consist of both classroom and demonstration sessions which cover all aspects of cross-connection control and recycled water shut down testing.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Differentiate between different backflow devices and methods.
- Compare and contrast the effective uses of backflow devices and explain their limitations.
- Describe the specifications, installation, and operation of typical devices used in backflow prevention and testing and explain their proper installation.
- Perform accurate backflow prevention tests using proper test equipment.
- Analyze backflow prevention test results using standardized test reporting forms.
- Evaluate backflow testing device malfunctions.
- Articulate the importance of proper backflow testing equipment selection and use.
- Cite specific laws pertaining to cross-connection control programs.
- Complete basic backflow testing device repairs requiring breakdown and reassembly.
- Articulate the AWWA and ABPA testing standards.

**Associate in Science Degree Requirements:**

Course	Title	Units
CWS 101	Fundamentals of Water & Wastewater	3
CWS 102	Calculations in Water & Wastewater	3
CWS 130	Water Distribution Systems	3
CWS 204	Applied Hydraulics	3
CWS 280	Backflow Tester Training	2
CWS 282	Cross-Connection Control Specialist	3
CWS 284	Cross-Connection Control Specialist- Recycled Water	3
		20

**Select at least nine units from the following:**

CWS 103	Water Resources Management	3
CWS 105	Water Conservation	3
CWS 106	Electrical & Instrumentation Processes	3
CWS 110	Laboratory Analysis for Water & Wastewater	3
CWS 115	Wastewater Reclamation and Reuse	3
CWS 132	Wastewater Collection Systems	3
CWS 134	Pumps, Motors, & Valves	3
CWS 290	Cooperative Work Experience	2
		9-11
	Total Required	29-31
	Plus General Education Requirements	

**Certificate of Achievement**

Students who complete only the major requirements above qualify for a Certificate in Backflow & Cross-Connection Control. 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 OPERATIONS**

Students in this major learn the methods, processes, technology, and current practices involved in operating and maintaining modern, complex water distribution systems. Students who satisfactorily complete the required courses for this certificate and/or degree program will qualify to take the CDPH Grade D-1 through D-5 Water Distribution Operator examinations required to obtain certification and employment with a water district.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Identify sources and characteristics of water common to water distribution systems.
- Compare and contrast the different types of water distribution systems currently used in the United States.
- Identify drinking water public health hazards and water quality standards common to the industry.
- Using calculations and conversions, determine water flow, pressure, volume, velocity and force, and chemical dosage used in water distribution systems.
- Identify and compare methods used to handle, install and repair water distribution pipe.
- Explain principles of pump operation for the types of pumps used in water distribution systems, including common problems, necessary adjustments, and typical packing gland problems.
- Explain the electrical principles involved in control circuits common to water distribution systems.
- Explain the required safe handling and storage of chlorine used in water distribution systems.
- Check and utilize water maps and drawings to determine location, type and characteristics of water distribution systems.
- Specify necessary procedures needed to safely complete field work in a water distribution system.
- Compare and contrast factors considered in the selection of pipe and different types of water meters.
- Demonstrate the ability to read meters and calculate the meter accuracy.

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CWS 100	Career Pathways in Water & Wastewater	3
CWS 101	Fundamentals of Water & Wastewater	3
CWS 102	Calculations in Water & Wastewater	3
CWS 106	Electrical & Instrumentation Processes	3
CWS 107	Safety in Water & Wastewater	3
CWS 110	Laboratory Analysis for Water & Wastewater	3
CWS 130	Water Distribution Systems	3
CWS 134	Pumps, Motors, & Valves	3
CWS 204	Applied Hydraulics	3
CWS 230	Advanced Water Distribution Systems	3
		30

**Select at least six units from the following:**

CWS 103	Water Resources Management	3
CWS 105	Water Conservation	3
CWS 112	Water Treatment Plant Operations	3
CWS 115	Wastewater Reclamation and Reuse	3
CWS 132	Wastewater Collection Systems	3
CWS 210	Advanced Laboratory Analysis for Water & Wastewater	3
CWS 212	Advanced Water Treatment Plant Operations	3
CWS 232	Advanced Wastewater Collection Systems	3
CWS 270	Public Works Supervision	3
CWS 280	Backflow Tester Training	2
CWS 282	Cross-Connection Control Specialist	3
CWS 284	Cross-Connection Control Specialist–Recycled Water	3
CWS 290	Cooperative Work Experience	2
		6-7
	Total Required	36-37
	Plus General Education Requirements	

**Certificate of Achievement**

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

**III. WATER RESOURCES MANAGEMENT**

This major prepares students to design, implement and evaluate water conservation/ water resources management programs and to assist in developing more diversified water resource portfolios in the water and wastewater sector or in the landscape and property management field. Emphasis is on emerging technologies and methods that lead to long-term sustainability of our water and wastewater resources. Attaining a certificate or degree in this major will prepare students to enter careers in water conservation, watershed management, water resources and groundwater, public information, and community education. Careers in landscape and facilities maintenance, irrigation system design, urban water management, and landscape design are also options. Students successfully completing the core requirements for this major will qualify to take the American Water Works Association's Water Use Efficiency Practitioner certification examination, the Landscape Water Management certification offered by the California Landscape Contractor's Association, and the Certified Landscape Water Manager certification offered by the Irrigation Association. In addition to preparing students for entry level jobs in the water and wastewater field, courses in this major prepare students to transfer to a number of four-year college or university degree programs, including Water Resources, Environmental Sciences, and Natural Resources Management.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Describe the essential uses of water, the infrastructure that has been developed to meet demand, and the problems the water industry faces.
- Identify a specified number of legal and financial constraints which complicate efficient and effective water resource management.
- Explain the concept and importance of water portfolio diversification.

- Describe the political/organizational structures and list the major agencies involved in providing water in the greater San Diego region.
- Compare and contrast the sources of wastewater, the major collection/transportation networks, and the major wastewater treatment/reclamation facilities operating in San Diego County.
- Identify the major regulatory agencies that monitor and regulate the water/wastewater industry.
- Explain how the current carbon footprint of the water and wastewater infrastructure significantly impacts California's energy and power demands.
- Compare and contrast a specified number of resource recovery/alternative treatment methods.

**Associate in Science Degree Requirements:**

<i>Course</i>	<i>Title</i>	<i>Units</i>
CWS 101	Fundamentals of Water & Wastewater	3
CWS 103	Water Resources Management	3
CWS 105	Water Conservation	3
CWS 115	Wastewater Reclamation and Reuse	3
OH 120	Fundamentals of Ornamental Horticulture	3
OH 170	Plant Materials: Trees and Shrubs	3
OH 221	Landscape Construction: Irrigation and Carpentry	3
OH 250	Landscape Water Management	2
CWS 290	Cooperative Work Experience	2
or		
OH 290	Cooperative Work Experience Education	2
		25

**Select two of the following:**

CWS 102	Calculations in Water & Wastewater	3
CWS 112	Water Treatment Plant Operations	3
CWS 114	Wastewater Treatment Plant Operations	3
CWS 130	Water Distribution Systems	3
CWS 132	Wastewater Collection Systems	3
CWS 280	Backflow Tester Training	2
CWS 282	Cross-Connection Control Specialist	3
CWS 284	Cross-Connection Control Specialist–Recycled Water	3
		5-6

**Select two of the following:**

OH 102	Xeriscape: Water Conservation in the Landscape	2
OH 140	Soils	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 238	Irrigation System Design	3
OH 255	Sustainable Urban Landscape Principles and Practices	2
		4-7
	Total Required	34-38
	Plus General Education Requirements	

**Certificate of Achievement**

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

**IV. WATER TREATMENT PLANT OPERATIONS**

Students enrolled in this major learn the key steps, processes, and current technology involved in operating modern water treatment plants. Students who satisfactorily complete the required courses in this certificate and/or degree program will qualify to take the California Department of Public Health (CDPH) Grade T-1 and T-2 Water Treatment Plant Operator examinations required for certification and employment at water treatment plants.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Identify in detail characteristics and sources of ground water and surface water supplies including the chemical, physical and bacterial characteristics, and explain the effects on quality of geological formations, stratifications, and watershed management.
- Compare the basic principles of each water treatment process and list them in order performed.
- Identify and classify water distribution system components.
- Explain pump cavitation, corrosion, cross-connection, air valves, head loss and main flushing in relation to water and wastewater collection, distribution, and treatment.
- Compare and contrast the basic principles of each water treatment process and list them in order performed.
- Explain and prepare a plan for the use of chlorine including the characteristics of and methods for storing, feeding and measuring chlorine including the effects of moisture, pH and temperature on feed rate, and the health and safety effects, procedures and personal protective requirements.
- Determine the methods used for coagulation, flocculation and sedimentation including common chemicals used, feed systems, effects of time temperature, turbidity and pH, and the measurement of turbidity and color.
- Compare and contrast the six basic water quality parameters and explain in detail microbiological and chemical components, including sampling requirements and properties.
- Demonstrate through testing basic knowledge of the regulations for monitoring water quality and performing water treatment.
- Perform basic mathematical calculations and conversions relating to water flow, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.
- Determine appropriate safety procedures applicable to service and operation of water treatment and distribution systems including potential problems.

**Associate in Science Degree Requirements:**

Course	Title	Units
CWS 100	Career Pathways in Water & Wastewater	3
CWS 101	Fundamentals of Water & Wastewater	3
CWS 102	Calculations in Water & Wastewater	3
CWS 106	Electrical & Instrumentation Processes	3
CWS 107	Safety in Water & Wastewater	3
CWS 110	Laboratory Analysis for Water & Wastewater	3
CWS 112	Water Treatment Plant Operations	3
CWS 134	Pumps, Motors & Valves	3
CWS 204	Applied Hydraulics	3
CWS 212	Advanced Water Treatment Plant Operations	3
		<u>30</u>

**Select at least six units from the following:**

CWS 103	Water Resources Management	3
CWS 105	Water Conservation	3
CWS 114	Wastewater Treatment Plant Operations	3
CWS 115	Wastewater Reclamation and Reuse	3
CWS 130	Water Distribution Systems	3
CWS 210	Advanced Laboratory Analysis for Water & Wastewater	3
CWS 214	Advanced Wastewater Treatment Plant Operations	3
CWS 230	Advanced Water Distribution Systems	3
CWS 268	Membrane Plant Operation	3
CWS 270	Public Works Supervision	3
CWS 280	Backflow Tester Training	2
CWS 282	Cross-Connection Control Specialist	3
CWS 290	Cooperative Work Experience	2
		<u>6-7</u>
	Total Required	36-37
	Plus General Education Requirements	

**Certificate of Achievement**

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

**V. WASTEWATER COLLECTION SYSTEMS**

Students completing the required courses for this major will qualify to take nearly a dozen wastewater related certification examinations offered by the California Water Environment Association (CWEA). Although current State regulations do not require certification of wastewater collection system personnel, many public sector employers either require or prefer job applicants who have obtained the CWEA Wastewater Collection and Maintenance certifications.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Define common terminology pertaining to collections system components, design, and management as well as inspection and quality control.
- Identify the types and functions of pipes and fittings used in wastewater collection system design and management.
- Given a wastewater collection map book, identify pipeline dimensions, pipe construction materials, direction of flow, and location of valves, services and lift stations.
- Describe in detail basic underground location and leak detection, trenching and shoring, and backfill and compaction methods of construction used in the field.
- Describe the nine basic cleaning methods and basic principles involved in hydraulic and mechanical cleaning methods.
- List and describe the operation of common valves used in a wastewater collection system.
- Perform basic mathematical computations and conversions relating to wastewater collection systems, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.

**Associate in Science Degree Requirements:**

Course	Title	Units
CWS 100	Career Pathways in Water & Wastewater	3
CWS 101	Fundamentals of Water & Wastewater	3
CWS 102	Calculations in Water & Wastewater	3
CWS 106	Electrical & Instrumentation Processes	3
CWS 107	Safety in Water & Wastewater	3
CWS 132	Wastewater Collection Systems	3
CWS 134	Pumps, Motors & Valves	3
CWS 204	Applied Hydraulics	3
CWS 232	Advanced Wastewater Collection Systems	3
CWS 282	Cross-Connection Control Specialist	3
		<u>30</u>

**Select at least six units from the following:**

CWS 103	Water Resources Management	3
CWS 110	Laboratory Analysis for Water & Wastewater	3
CWS 112	Water Treatment Plant Operations	3
CWS 114	Wastewater Treatment Plant Operations	3
CWS 115	Wastewater Reclamation and Reuse	3
CWS 130	Water Distribution Systems	3
CWS 210	Advanced Laboratory Analysis for Water & Wastewater	3
CWS 214	Advanced Wastewater Treatment Plant Operations	3
CWS 230	Advanced Water Distribution Systems	3
CWS 270	Public Works Supervision	3
CWS 280	Backflow Tester Training	2
CWS 284	Cross-Connection Control Specialist-Recycled Water	3
CWS 290	Cooperative Work Experience	2
		<u>6-7</u>
	Total Required	36-37
	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.

**VI. WASTEWATER TREATMENT OPERATIONS**

Students who complete the required courses for this certificate and/or degree program will qualify to take the SWRCB certification examination for the Grade I Wastewater Plant Operator as well as nearly a dozen wastewater related certification examinations offered by CWEA. There are over 80 wastewater treatment and reclamation facilities in San Diego County that are currently licensed and regulated by the SWRCB.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Describe wastewater collection system components.
- Identify the characteristics and sources of municipal sewage.
- Define wastewater collection system and wastewater treatment plant terminology.
- Describe the basic principles of conventional wastewater treatment.
- Compare and contrast wastewater treatment unit processes including preliminary, primary, secondary and tertiary treatment.
- Explain the basic principles of preliminary, primary, secondary and tertiary treatment.

- Perform basic mathematical calculations and conversions relating to water flow, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.
- Recognize and comment on safety procedures applicable to service and operation of wastewater collection and treatment systems, including potential problems.

**Associate in Science Degree Requirements:**

Course	Title	Units
CWS 100	Career Pathways in Water & Wastewater	3
CWS 101	Fundamentals of Water & Wastewater	3
CWS 102	Calculations in Water & Wastewater	3
CWS 106	Electrical & Instrumentation Processes	3
CWS 107	Safety in Water & Wastewater	3
CWS 110	Laboratory Analysis for Water & Wastewater	3
CWS 114	Wastewater Treatment Plant Operations	3
CWS 134	Pumps, Motors & Valves	3
CWS 204	Applied Hydraulics	3
CWS 214	Advanced Wastewater Treatment Plant Operations	3
		30

**Select at least six units from the following:**

CWS 103	Water Resources Management	3
CWS 112	Water Treatment Plant Operations	3
CWS 115	Wastewater Reclamation and Reuse	3
CWS 130	Water Distribution Systems	3
CWS 132	Wastewater Collection Systems	3
CWS 210	Advanced Laboratory Analysis for Water & Wastewater	3
CWS 212	Advanced Water Treatment Plant Operations	3
CWS 232	Advanced Wastewater Collection Systems	3
CWS 268	Membrane Plant Operation	3
CWS 270	Public Works Supervision	3
CWS 280	Backflow Tester Training	2
CWS 282	Cross-Connection Control Specialist	3
CWS 284	Cross-Connection Control Specialist-Recycled Water	3
CWS 290	Cooperative Work Experience	2
		6-7
	Total Required	36-37
	Plus General Education Requirements	

**Certificate of Achievement**

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

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**Comments:**

(Effective Spring 2019)

New Certificates of Specialization added to Center for Water Studies (formerly Water/Wastewater Technology).Δ

**CERTIFICATES OF SPECIALIZATION**

Students who complete the requirements below qualify for a certificate 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.

**WATER DISTRIBUTION OPERATIONS, STACKABLE CERTIFICATES OF SPECIALIZATION**

**WATER & WASTEWATER FUNDAMENTALS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Water Distribution System Operations-1 – Identify sources and characteristics of water common to water distribution systems.
- Water Distribution System Operations-4 – Using calculations and conversions, determine water flow, pressure, volume, velocity and force, and chemical dosage used in water distribution systems.
- Water Distribution System Operations-10 – Specify necessary procedures needed to safely complete field work in a water distribution system.

**Certificate Requirements:**

Course	Title	Units
CWS 100	Career Pathways in Water & Wastewater	3
CWS 101	Fundamentals of Water & Wastewater	3
CWS 102	Calculations in Water & Wastewater	3
CWS 107	Safety in Water & Wastewater	3
	Total Required	12

**WATER DISTRIBUTION OPERATIONS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Water Distribution System Operations-3 – Identify drinking water public health hazards and water quality standards common to the industry.
- Water Distribution System Operations-4 – Using calculations and conversions, determine water flow, pressure, volume, velocity and force, and chemical dosage used in water distribution systems.
- Water Distribution System Operations-6 – Explain principles of pump operation for the types of pumps used in water distribution systems including common problems, necessary adjustments, and typical packing gland problems.

**Certificate Requirements:**

Course	Title	Units
CWS 106	Electrical & Instrumentation Processes	3
CWS 130	Water Distribution Systems	3
CWS 134	Pumps, Motors & Valves	3
	Total Required	9

**ADVANCED WATER DISTRIBUTION OPERATIONS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Water Distribution System Operations-5 – Identify and compare methods used to handle, install and repair water distribution pipe.
- Water Distribution System Operations-7 – Explain the electrical principles involved in control circuits common to water distribution systems.
- Water Distribution System Operations-8 – Explain the required safe handling and storage of chlorine used in water distribution systems.
- Water Distribution System Operations-11 – Compare and contrast factors considered in the selection of pipe and different types of water meters.

**Certificate Requirements:**

Course	Title	Units
CWS 110	Laboratory Analysis for Water & Wastewater	3
CWS 204	Applied Hydraulics	3
CWS 230	Advanced Water Distribution Systems	3
	Total Required	9

**WATER TREATMENT PLANT OPERATIONS, STACKABLE CERTIFICATES OF SPECIALIZATION**

**WATER & WASTEWATER FUNDAMENTALS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Water Treatment Plant Operator-1 – Identify in detail characteristics and sources of ground water and surface water supplies including the chemical, physical and bacterial characteristics, and explain the effects on quality of geological formations, stratifications, and watershed management.
- Water Treatment Plant Operator-10 – Perform basic mathematical calculations and conversions relating to water flow, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.
- Water Treatment Plant Operator-11 – Determine appropriate safety procedures applicable to service and operation of water treatment and distribution systems including potential problems.

**Certificate Requirements:**

Course	Title	Units
CWS 100	Career Pathways in Water & Wastewater	3
CWS 101	Fundamentals of Water & Wastewater	3
CWS 102	Calculations in Water & Wastewater	3
CWS 107	Safety in Water & Wastewater	3
	Total Required	12

**WATER TREATMENT PLANT OPERATIONS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Water Treatment Plant Operator-2 – Compare the basic principles of each water treatment process and list them in order performed.
- Water Treatment Plant Operator-5 – Compare and contrast the basic principles of each water treatment process and list them in order performed.
- Water Treatment Plant Operator-9 – Demonstrate through testing basic knowledge of the regulations for monitoring water quality and performing water treatment.

**Certificate Requirements:**

Course	Title	Units
CWS 106	Electrical & Instrumentation Processes	3
CWS 110	Laboratory Analysis for Water & Wastewater	3
CWS 112	Water Treatment Plant Operations	3
Total Required		9

**ADVANCED WATER TREATMENT PLANT OPERATIONS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Water Treatment Plant Operator-5 – Compare and contrast the basic principles of each water treatment process and list them in order performed.
- Water Treatment Plant Operator-6 – Explain and prepare a plan for the use of chlorine including the characteristics of and methods for storing, feeding and measuring chlorine including the effects of moisture, pH and temperature on feed rate, and the health and safety effects, procedures and personal protective requirements.
- Water Treatment Plant Operator-7 – Determine the methods used for coagulation, flocculation and sedimentation including common chemicals used, feed systems, effects of time temperature, turbidity and pH, and the measurement of turbidity and color.
- Water Treatment Plant Operator-9 – Demonstrate through testing basic knowledge of the regulations for monitoring water quality and performing water treatment.

**Certificate Requirements:**

Course	Title	Units
CWS 134	Pumps, Motors & Valves	3
CWS 204	Applied Hydraulics	3
CWS 212	Advanced Water Treatment Plant Operations	3
Total Required		9

**WASTEWATER COLLECTION SYSTEMS, STACKABLE CERTIFICATES OF SPECIALIZATION**

**WATER & WASTEWATER FUNDAMENTALS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Wastewater Collection Systems-1 – Define common terminology pertaining to collections system components, design, and management as well as inspection and quality control.
- Wastewater Collection Systems-3 – Given a wastewater collection map book, identify pipeline dimensions, pipe construction materials, direction of flow, and location of valves, services and lift stations.
- Wastewater Collection Systems-7 – Perform basic mathematical computations and conversions relating to wastewater collection systems, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.

**Certificate Requirements:**

Course	Title	Units
CWS 100	Career Pathways in Water & Wastewater	3
CWS 101	Fundamentals of Water & Wastewater	3
CWS 102	Calculations in Water & Wastewater	3
CWS 107	Safety in Water & Wastewater	3
Total Required		12

**WASTEWATER COLLECTION SYSTEMS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Wastewater Collection Systems-4 – Describe in detail basic underground location and leak detection, trenching and shoring, and backfill and compaction methods of construction used in the field.
- Wastewater Collection Systems-5 – Describe the nine basic cleaning methods and basic principles involved in hydraulic and mechanical cleaning methods.
- Wastewater Collection Systems-6 – List and describe the operation of common valves used in a wastewater collection system.

**Certificate Requirements:**

Course	Title	Units
CWS 132	Wastewater Collection Systems	3
CWS 134	Pumps, Motors & Valves	3
CWS 282	Cross-Connection Control Specialist	3
Total Required		9

**ADVANCED WASTEWATER COLLECTION SYSTEMS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Wastewater Collection Systems-7 – Perform basic mathematical computations and conversions relating to wastewater collection systems, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.
- Wastewater Collection Systems-5 – Describe the nine basic cleaning methods and basic principles involved in hydraulic and mechanical cleaning methods.
- Wastewater Collection Systems-2 – Identify the types and functions of pipes and fittings used in wastewater collection system design and management.
- Wastewater Collection Systems-4 – Describe in detail basic underground location and leak detection, trenching and shoring, and backfill and compaction methods of construction used in the field.

**Certificate Requirements:**

Course	Title	Units
CWS 106	Electrical & Instrumentation Processes	3
CWS 204	Applied Hydraulics	3
CWS 232	Advanced Wastewater Collection Systems	3
Total Required		9

**WASTEWATER TREATMENT OPERATIONS, STACKABLE CERTIFICATES OF SPECIALIZATION**

**WATER & WASTEWATER FUNDAMENTALS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Wastewater Treatment Operator-1 – Identify in detail characteristics and sources of ground water and surface water supplies including the chemical, physical and bacterial characteristics, and explain the effects on quality of geological formations, stratifications, and watershed management.
- Wastewater Treatment Operator-7 – Perform basic mathematical calculations and conversions relating to water flow, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.
- Wastewater Treatment Operator-8 – Recognize and comment on safety procedures applicable to service and operation of wastewater collection and treatment systems, including potential problems.

**Certificate Requirements:**

Course	Title	Units
CWS 100	Career Pathways in Water & Wastewater	3
CWS 101	Fundamentals of Water & Wastewater	3
CWS 102	Calculations in Water & Wastewater	3
CWS 107	Safety in Water & Wastewater	3
Total Required		12

**WASTEWATER TREATMENT OPERATIONS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Wastewater Treatment Operator-2 – Identify the characteristics and sources of municipal sewage.
- Wastewater Treatment Operator-4 – Describe the basic principles of conventional wastewater treatment.
- Wastewater Treatment Operator-8 – Recognize and comment on safety procedures applicable to service and operation of wastewater collection and treatment systems, including potential problems.

**Certificate Requirements:**

Course	Title	Units
CWS 106	Electrical & Instrumentation Processes	3
CWS 110	Laboratory Analysis for Water & Wastewater	3
CWS 114	Wastewater Treatment Plant Operations	3
Total Required		9

**ADVANCED WASTEWATER TREATMENT OPERATIONS**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Wastewater Treatment Operator-7 – Perform basic mathematical calculations and conversions relating to water flow, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.
- Wastewater Treatment Operator-3 – Describe the specifications, installation, and operation of typical devices used in backflow prevention and testing and explain their proper installation.
- Wastewater Treatment Operator-6 – Explain the basic principles of preliminary, primary, secondary and tertiary treatment.
- Wastewater Treatment Operator-5 – Compare and contrast wastewater treatment unit processes including preliminary, primary, secondary and tertiary treatment.

**Certificate Requirements:**

Course	Title	Units
CWS 134	Pumps, Motors & Valves	3
CWS 204	Applied Hydraulics	3
CWS 214	Advanced Wastewater Treatment Plant Operations	3
Total Required		9

**Pages: 75**

**Comments:**

Moved the program from Engineering to Computer Science. Added CADD 125 (cross-listed with ENGR 125), 3D Solid Modeling, CADD 129 (cross-listed with ENGR 129), Engineering Solid Modeling as options to the requirements; also added CS

175 (cross-listed with ENGR 175), Mechatronics: Introduction Microcontrollers and Robotics, CS 176 (cross-listed with ENGR 176), Mechatronics: Prototype Design, CS 181, Introduction to C++ Programming, and CIS 267, Directed Work Experience in CIS to the requirements.Δ

**COMPUTER SCIENCE**

**MECHATRONICS**

This certificate is designed for students interested in designing automatic electromechanical devices and systems. The curriculum is intended primarily for students interested in working in advanced manufacturing. It also provides the foundation for further studies in the skills required for the Internet of Things (physical computing and control systems)..

**Program Learning Outcomes**

Upon successful completion of this certificate, students will be able to:

- Write computer programs in high-level languages such as C++ and, when appropriate, in assembly language to control the operation of a microcontroller. In particular, students will be able to apply the following microcontroller capabilities: memory-mapped I/O (input/output), analog-to-digital (A/D) conversion, and volatile and non-volatile memory.
- Design automatic devices and control systems which can respond to inputs from sensors with appropriate outputs in the form of motion, light, and sound.
- Design mechanical components and devices, and create prototype versions of them.
- Combine the above capabilities to design integrated electro-mechanical devices of arbitrary complexity.

**Certificate Requirements:**

Course	Title	Units
CADD/ENGR 125	3D Solid Modeling	3
or		
CADD/ENGR 129	Engineering Solid Modeling	3
CS/ENGR 175	Mechatronics: Introduction to Microcontrollers and Robotics	3
CS/ENGR 176	Mechatronics: Prototype Design	3
CS 181	Introduction to C++ Programming	4
CIS 267	Directed Work Experience in CIS	1-4
or		
ENGR 182	Work Experience in Engineering Technology	1-3
ENGR 100	Introduction to Engineering and Design	4
ET 110	Introduction to Basic Electronics	4
Total Required		22-25

**Certificate of Achievement**

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

**Pages: 75**

**Comments:**

(Effective Spring 2019)

One course added to the List B options ENGL 214, Masterpieces of Drama. ENGL 236, Chicano/Chicana Literature, and ENGL 238, Black Literature moved from the List B options to the List C options. ENGL 207, Romance Fiction, ENGL 214, Masterpieces of Drama, ENGL 275, Literary Period, ENGL 276, Major Author and ENGL 277, Literary Theme removed from the program List C options.°

**ENGLISH**



Associate Degree for Transfer™

**I. ENGLISH FOR TRANSFER (AA-T)**

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.

The following is required for the AA-T in English for Transfer degree:

1. Minimum of 60 semester or 90 quarter CSU-transferable units.
2. Minimum grade point average (GPA) of at least 2.0 in all CSU-transferable coursework.
3. Minimum of 18 semester or 27 quarter units in the major.
4. A grade of "C" or better in all courses required for the major.
5. Certified completion of the California State University General Education (CSU GE) Breadth pattern OR the Intersegmental General Education Transfer Curriculum (IGETC) pattern; see Degree Requirements and Transfer Information section for more information. Note: If following IGETC, IGETC-CSU must be followed for admission to a CSU.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Demonstrate the ability to express themselves effectively in largely error-free writing in multiple modes and genres.
- Demonstrate the ability to analyze a variety of texts including fiction and non-fiction.
- Utilize the writing process to approach, complete and refine writing projects.
- Demonstrate familiarity with major British, American, and world authors and literary movements.
- Locate, evaluate, and effectively integrate outside research into their writing to support their explicit theses while avoiding plagiarism

## Associate Degree Programs and Certificates

and adhering to scholarly standards for citation of information.

### Associate in Arts Degree Requirements: Core Curriculum:

Course	Title	Units
ENGL 122	Introduction to Literature	3
ENGL 124	Advanced Composition: Critical Reasoning and Writing	3
		<u>6</u>

#### List A: Select two 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 270	World Literature I	3
ENGL 271	World Literature II	3
		<u>6</u>

#### List B: Select one of the following:

ENGL 126	Creative Writing	3
ENGL 201	Images of Women in Literature	3
ENGL 202	Introduction to Film as Literature	3
ENGL 214	Masterpieces of Drama	3
ENGL 217	Fantasy and Science Fiction	3
Any course from List A not selected above		3
		<u>3</u>

#### List C: Select one of the following:

ENGL 236	Chicano/Chicana Literature	3
ENGL 238	Black Literature	3
ARAM 120	Aramaic I	5
ARAM 121	Aramaic II	5
ARAM 220	Aramaic III	5
ARBC 120	Arabic I	5
ARBC 121	Arabic II	5
ARBC 220	Arabic III	5
ARBC 221	Arabic IV	5
ASL 120	American Sign Language I	4
ASL 121	American Sign Language II	4
ASL 220	American Sign Language III	4
ASL 221	American Sign Language IV	4
BUS 128	Business Communication	3
FREN 120	French I	5
FREN 121	French II	5
FREN 220	French III	5
FREN 221	French IV	5
HUM 110	Principles of the Humanities	3
ITAL 120	Italian I	5
ITAL 121	Italian II	5
ITAL 220	Italian III	5
SPAN 120	Spanish I	5
SPAN 121	Spanish II	5
SPAN 220	Spanish III	5
SPAN 221	Spanish IV	5
THTR 110	Introduction to the Theatre	3
Any course from Lists A or B not selected above		3
		<u>3-5</u>

Total Units for Major (6 units may double counted with GE) 18-20

Total Units for IGETC-CSU or CSU GE Breadth 37-39

Total Transferable

Elective Units 13-15/15-17

Total Units for Degree 60

Please note: SDSU accepts this degree for students transferring into English-Applied Arts and Sciences major.

## Pages: 76

### Comments:

Added BUS 112, Craft Entrepreneur and BUS 115, Human Relations in Business to the first list of elective options in the requirements. Added BOT 132, Google Applications for Business and BOT 174, Computer Concepts and Applications to the second list of elective options in the requirements; removed BOT 100, Basic Keyboarding, BOT 101AB, Keyboarding/Document Processing I-II, BOT 102AB, Intermediate Keyboarding/Document Processing I-II, CIS 105, Introduction to Computing, and CIS 110, Principles of Information Systems from the second list of elective options in the requirements.Δ

## ENTREPRENEURSHIP- SMALL BUSINESS MANAGEMENT

This degree program provides a course of study for students who are interested in developing an appreciation and understanding of the functional areas within the small business environment. The degree 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.

### Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Recognize and appropriately respond to ethical and legal concerns relating to human resource and organizational management.
- Identify and analyze business problems or entrepreneurial opportunities and effectively communicate recommendations for courses of actions.
- Demonstrate an understanding of the requirements to start a new venture, including the basics of leadership, team building, finance, marketing and management.

### 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
		<u>15-16</u>

### Select two of the following:

BUS 112	Craft Entrepreneur	2
BUS 115	Human Relations in Business	3
BUS 156	Principles of Management	3
BUS 176	Computerized Accounting Applications	2
		<u>4-6</u>

### Select at least three units from the following:

BOT 114	Essential Word	1
BOT 115	Essential Excel	1
BOT 116	Essential Access	1
BOT 117	Essential PowerPoint	1
BOT 132	Google Applications for Business	3
BOT 174	Computer Concepts and Applications	3
		<u>3</u>
Total Required		22-25
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.

## Page: 81

### Comments:

Revisions made to Exercise Science Associate in Science Degree Requirements#

## KINESIOLOGY

### II. EXERCISE SCIENCE

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.

### Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- List and define the five basic components of physical fitness.
- Describe the concepts of frequency, intensity and time, and how they relate to personal fitness goals.
- Outline a basic strategy for achieving fitness through the lifespan.
- List options within the community for continued lifelong physical activity.
- List benefits of daily physical activity.
- Demonstrate competence in acquiring sound nutritional information.
- Demonstrate improvement in sport skills.
- Outline appropriate goals and activities for increasing the fitness of children.
- Describe appropriate preventive measures as well as treatments for various sport injuries.
- List and describe opportunities for employment in the field.
- Describe their field of interest and a course of instruction that will meet their professional needs.

**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 102	Introduction to General, Organic and Biological Chemistry#	5
<b>or</b>		
CHEM 115	Fundamentals of Chemistry	4
<b>or</b>		
CHEM 120	Preparation for General Chemistry#	4
<b>or</b>		
CHEM 141	General Chemistry I#	5
COMM 122	Public Speaking	3
ES 014ABC	Body Building	1.5
<b>or</b>		
ES 019ABC	Physical Fitness#	1.5
ES 250	Introduction to Kinesiology	3
ES 255	Care and Prevention of Athletic Injuries	3
HED 158	Nutrition for Fitness and Sports	3
<b>or</b>		
HED 255*	Science of Nutrition	3
PSY 120	Introductory Psychology	3
SOC 120	Introductory Sociology	3
		32.5-33.5#

**Select one of the following:**

BIO 215	Statistics for Life Sciences	3
MATH 160	Elementary Statistics	4
PSY 215	Statistics for the Behavioral Sciences	4
		3-4

**Select two of the following (fulfills the activity requirement for the associate degree):**

ES 001	Adapted Physical Exercise	1
ES 009ABC	Aerobic Dance Exercise	1
ES 019ABC	Physical Fitness	1.5
ES 060ABC	Badminton	1
ES 076ABC	Tennis	1
ES 125ABC	Golf	1-1.5
ES 155ABC	Basketball	1
ES 170ABC	Soccer	1
ES 171ABC	Softball	1
ES 175ABC	Volleyball	1
		2-3
	Total Required	37.5-40.5#
	Plus General Education Requirements	

\*Students planning to transfer to SDSU must take HED 255.

**Page: 82**

**Comments:**

Added ECON 110, Economic Issues and Policies, and ECON 120 as choices in the requirements; removed COMM 122, Public Speaking from the requirements. Added BOT 174, Computer Concepts and Applications to the first list of elective options in the requirements; removed CIS 105, Introduction to Computing from the first list of elective options in the requirements. Added BUS 161, Business Internship and COMM 122, Public Speaking to the second list of elective options in the requirements; removed BUS 159ABCD, Management Internship and ECON 120, Principles of Macroeconomics from the second list of elective options in the requirement; increased the units in the second elective options list from one unit to three units. Δ

**MANAGEMENT**

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 mid-level or higher management positions in any type of organization including business, government and service organizations.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Recognize and appropriately evaluate the ethical and legal concerns inherent in various business practices.
- Identify the differences in leadership and management theories and how they facilitate the overall effectiveness of domestic and multinational business operations.
- Identify and assess business problems from a subordinate and managerial perspective.
- Identify and analyze business problems or entrepreneurial opportunities and effectively communicate recommendations for courses of actions.

**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:**

Course	Title	Units
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
ECON 110	Economic Issues and Policies	3
<b>or</b>		
ECON 120	Principles of Macroeconomics	3
		22

**Select two of the following:**

BOT 123-125	Comprehensive Excel Levels I-III	3
BOT 174	Computer Concepts and Applications	3
BUS 176	Computerized Accounting Applications	2
CIS 110	Principles of Information Systems	4
		5-7

**Select a minimum of three units of the following:**

BUS 110	Introduction to Business	3
BUS 121	Managerial Accounting	4
BUS 161	Business Internship	1-3
BUS 195	Principles of Money Management for Success	3
COMM 122	Public Speaking	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.

**Page: 87**

**Comments:**

Revisions made to Landscape Technology Associate in Science Degree Requirements#

# ORNAMENTAL HORTICULTURE

**VI. LANDSCAPE TECHNOLOGY**

Landscape installation and management forms the focus of this program. Students will learn the latest methods, materials and techniques in the landscape industry. Those 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 to upgrade their 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 may be self-employed.

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:

- Understand the principles of plant structure function and plant growth.
- Identify 175 trees, shrubs, annuals, perennials and turf grass species commonly used in Southern California landscapes.
- Using standard industry practices, develop guidelines and demonstrate the ability to perform proper fertilizing, pruning, mulch application and irrigation of Southern California landscapes.
- Understand the elements of water management of a large landscape site.
- Identify common biotic and abiotic problems common to Southern California landscapes and list appropriate control measures.
- Gain practical experience working in the landscape industry.

**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 180	Plant Materials: Annuals and Perennials	3
OH 235	Principles of Landscape Irrigation	4
OH 250	Landscape Water Management	2
OH 290*	Cooperative Work Experience Education	3
		<u>24</u>

**Select one of the following:**

BUS 110	Introduction to Business	3
BUS 111	Entrepreneurship: Starting and Developing a Business	3
BUS 125	Business Law: Legal Environment of Business	3
		<u>3</u>

**Select five units from the following:**

OH 102	Xeriscape: Water Conservation in the Landscape	2
OH 105	Edibles in Urban Landscapes	1.5
OH 125	Landscape Technician Principles 1	1
OH 126	Landscape Technician Principles 2	1
OH 127	Landscape Technician Principles 3	1
OH 172	Introduction to Landscape Design	3
OH 173	Intermediate Landscape Design	3
OH 174	Turf and Ground Cover Management	3
OH 220	Landscape Construction: Concrete and Masonry	3
OH 221	Landscape Construction: Irrigation and Carpentry	3
OH 222	Japanese Garden Design and Construction	1
OH 225	Landscape Contracting	3
OH 255	Sustainable Urban Landscapes Principles and Practices	3
OH 260	Arboriculture	3
OH 275	Diagnosing Horticultural Problems#	3
OH 276	Horticultural Equipment Repair and Maintenance	3
OH 278	Business Management for Ornamental Horticulture	3
SPAN 120	Spanish I	5
		<u>5</u>
	Total Required	32
	Plus General Education Requirements	

\*Student must complete six 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.

**Page: 95-96**

**Comments:**

Corrections from Associate in Science to Associate in Arts for University Studies; Area B. Communications and Language Arts, Area C. Humanities and Fine Arts, and Area E. Social and Behavioral Sciences.#

# UNIVERSITY STUDIES

**B. Communication and Language Arts**

Courses for the Associate in Arts# in University Studies with an Emphasis in Communication and Language Arts focus on the study of how language works to express human ideas and feelings. Students will explore and analyze written and verbal communication methods, as well as develop and advance their oral and written communication skills. Students completing this area may be interested in the following baccalaureate majors: communication, English, foreign language, literature, journalism, and linguistics. Students must complete a minimum of six units in Communication and six units in Language Arts. The remaining six units may be taken from either category.

**C. Humanities and Fine Arts**

Courses for the Associate in Arts# in University Studies with an Emphasis in Humanities and Fine Arts focus on the study of cultural, humanistic activities, and artistic expression of human beings. Students will evaluate and interpret the ways in which people through the ages in different cultures have responded to themselves and the world around them through artistic and cultural creation. Students will develop an aesthetic awareness and incorporate these concepts when constructing value judgments. Students completing this area may be interested in the following baccalaureate majors: art, humanities, music, philosophy, religious studies, and theatre arts. Students must complete a minimum of six units in Humanities and six units in Fine Arts. The remaining six units may be taken from either category.

**E. Social and Behavioral Sciences**

Courses for the Associate in Arts# in University Studies with an Emphasis in Social and Behavioral Sciences focus on the study and understanding of human behavior. Students will evaluate and interpret human societies; the institutions, organizations, and the groups that form them; the ways in which individuals and groups relate to one another; and various approaches and methodologies of the disciplines. Students completing this area may be interested in the following baccalaureate majors: anthropology, child development, education, history, nutrition, political science, psychology, social work, and sociology. Students must complete a minimum of six units in Social Science and six units in Behavioral Science. The remaining six units may be taken from either category.

**Pages: 102-151**

**Comments:**

Courses approved as UC Transferable effective fall 2018:

ARBC 254	<i>Conversational Iraqi Dialect</i>	3
ART 148	<i>Applied Design And Crafts</i>	3
ART 149	<i>History of Graphic Design</i>	3
ART 177	<i>Digital Drawing and Painting</i>	3
CS 175	<i>Mechatronics: Introduction to Microcontrollers and Robotics</i>	3
CS 176	<i>Mechatronics: Prototype Design</i>	3
ENGL 236	<i>Chicano/Chicana Literature</i>	3
ENGL 238	<i>Black Literature</i>	3

**Page 150:**

**Comments:**

Water/Wastewater Technology (WWTR) program renamed Center for Water Studies, *effective Spring 2019*. Three new courses added, CWS 100, Career Pathways in Water & Wastewater, CWS 107, Safety in Water & Wastewater, and CWS 210 Advanced Laboratory Analysis for Water & Wastewater. All other WWTR courses have been changed to CWS numbering. Please see individual courses for more information.Δ

## CENTER FOR WATER STUDIES

**100 CAREER PATHWAYS IN WATER & WASTEWATER 3 UNITS**

Prerequisite: None  
3 hours lecture  
This course introduces students to Cuyamaca's Center for Water Studies and the career pathways in the water and wastewater field in San Diego County and throughout California. The goal of the course is to develop in each student the skills they need to succeed at Cuyamaca and in their careers in water. This will be the first course in the Center for Water Studies' new Fundamentals of Water module -- a series of four introductory courses -- and students will be encouraged to begin their studies in water and wastewater with the 100 course.  
CSU

**101 FUNDAMENTALS OF WATER & WASTEWATER 3 UNITS**

*(formerly WWTR 101)*  
3 hours lecture  
This course provides a broad overview of the water and wastewater fields and issues confronting the industry. Students will learn how source waters are obtained, treated, and distributed and how wastewater is collected, transported, and disposed of in the area. Contemporary issues facing the water and wastewater industry will be explored. *Not open to students with credit in WWTR 101.*  
CSU

**102 CALCULATIONS IN WATER & WASTEWATER 3 UNITS**

*(formerly WWTR 102)*  
Recommended Preparation: Competency in basic math skills  
3 hours lecture  
Study of the mathematical principles and methods involved in solving problems related to water and wastewater treatment, distribution, and collection systems, including volume, flow rate, velocity, pressure, force, unit conversions, dimensional analysis, chemical dose rates, dilutions, filter loading and backwash rates as related to water/wastewater technology. *Not open to students with credit in WWTR 102.*  
CSU

**103 WATER RESOURCES MANAGEMENT 3 UNITS**

*(formerly WWTR 103)*  
3 hours lecture  
With the ever increasing demands for safe and reliable supplies of potable water, combined with decreasing supplies and over commitments of our existing water resources, we are facing a serious water crisis in the western United States. This course explores the history and development of California water resources, legal and financial issues, water portfolio diversification, the role of groundwater recharge and management, wastewater reclamation and reuse, desalination, and energy conservation. *Not open to students with credit in WWTR 103.*  
CSU

**105 WATER CONSERVATION 3 UNITS**

*(formerly WWTR 105)*  
3 hours lecture  
This course provides theoretical and practical training in applied water use efficiency and a foundation in the need for and major components of comprehensive water conservation programs. Topics include residential, commercial, and landscape customers; water uses; budgets; demand management; water audits; Best Management Practices; rate structures; and program design and management. *Not open to students with credit in WWTR 105.*  
CSU

**106 ELECTRICAL & INSTRUMENTATION PROCESSES 3 UNITS**

*(formerly WWTR 106)*  
3 hours lecture  
An introductory course in basic electronic, electrical, and control system principles. Electrical safety precautions, component identification, schematic interpretation, motors, transformers, relays and test equipment will be studied. Automated process control devices and an overview of current technologies will be discussed. *Not open to students with credit in WWTR 106.*  
CSU

**107 SAFETY IN WATER & WASTEWATER 3 UNITS**

Prerequisite: None  
3 hours lecture  
This course provides a broad overview of Occupational Safety and Health issues in the water and wastewater industry. Students will learn the history of safety related laws and regulations for the Construction and General Industry. Contemporary safety related issues facing the water and wastewater industry will be explored with an emphasis on the Occupational Safety and Health Administration

of the California Department of Industrial Relations.

**110 LABORATORY ANALYSIS FOR WATER & WASTEWATER 3 UNITS**

*(formerly WWTR 110)*  
3 hours lecture  
Examines basic fundamentals of laboratory analysis with an emphasis on applied chemical and microbiological procedures for water and wastewater plant operators. Includes procedures and techniques used in physical, chemical, bacteriological and biological examination of water/wastewater. Completion of CWS 110 and CWS 210 provides the foundation necessary to obtain a CWEA Grade 1 Laboratory Analyst Certificate. *Not open to students with credit in WWTR 110.*  
CSU

**112 WATER TREATMENT PLANT OPERATIONS 3 UNITS**

*(formerly WWTR 112)*  
Recommended Preparation: "C" grade or higher or "Pass" in CWS 102 or equivalent  
3 hours lecture  
Study of the sources of water and the public health aspects of water supply; chemical, physical and bacteriological standards of water quality; types of water treatment plants; and water treatment procedures, operation, maintenance, storage and distribution. *Not open to students with credit in WWTR 112.*  
CSU

**114 WASTEWATER TREATMENT PLANT OPERATIONS 3 UNITS**

*(formerly WWTR 114)*  
3 hours lecture  
An introduction to the basic principles involved in the operation of conventional public wastewater treatment plants. Provides information on plant hydraulics, preliminary, primary and secondary treatment processes, disinfection, as well as environmental and safety regulation compliance. *Not open to students with credit in WWTR 114.*  
CSU

**115 WASTEWATER RECLAMATION AND REUSE 3 UNITS**

*(formerly WWTR 115)*  
3 hours lecture  
This course covers the fundamentals of wastewater reclamation and reuse. Topics include the history of wastewater treatment and reclamation; total resource recovery including bio-solids/biogas harvesting; planning, design, and construction of reclamation plants; and reclaimed wastewater distribution. Problems regarding regulations, marketing, and public perception of using reclaimed wastewater will be discussed, along with public safety issues. *Not open to students with credit in WWTR 115.*  
CSU

**130 WATER DISTRIBUTION SYSTEMS 3 UNITS**

*(formerly WWTR 130)*  
Recommended Preparation: "C" grade or higher or "Pass" in CWS 102 or equivalent  
3 hours lecture  
Study of the operation and maintenance of a water supply and distribution system. Water sources, water quality, treatment methods, distribution operations, customer metering, pipeline installation and repair, valves and appurtenances, storage tanks, and maintenance topics will be discussed. Includes mathematical and hydraulic formulas and principles to determine volume, flow, pressure and force. Part of a series required

## Course Descriptions

for eligibility to take the California Department of Public Health (CDPH) Water Distribution Operator certification examinations; supports certification examinations for CDPH Water Distribution Operator grade D1 and D2. *Not open to students with credit in WWTR 130.*  
CSU

### **132 WASTEWATER COLLECTION SYSTEMS 3 UNITS**

*(formerly WWTR 132)*

3 hours lecture

Study of the components of wastewater collection systems. Overview of design installation, operation, monitoring, maintenance and repair of sewer pipelines, pump stations and related facilities. *Not open to students with credit in WWTR 132.*

CSU

### **134 PUMPS, MOTORS & VALVES 3 UNITS**

*(formerly WWTR 134)*

3 hours lecture

Overview of the basic principles of mechanical equipment design, installation, operation, maintenance, repair, overhaul and replacement. Emphasis on understanding the value of preventative maintenance techniques such as equipment monitoring, lubrication analysis, machine alignment and scheduled overhaul. *Not open to students with credit in WWTR 134.*

CSU

### **204 APPLIED HYDRAULICS 3 UNITS**

*(formerly WWTR 104)*

Recommended Preparation: "C" grade or higher or "Pass" in CWS 102 or equivalent

3 hours lecture

Study of the hydraulic principles involved in the operation of water and wastewater distribution and collection systems. The behavior of water in closed-conduit pressure systems and open channel delivery systems, and the types of facilities and infrastructure utilized in water and wastewater service and their operational characteristics will be explored. *Not open to students with credit in WWTR 104.*

CSU

### **210 ADVANCED LABORATORY ANALYSIS FOR WATER & WASTEWATER 3 UNITS**

Prerequisite: "C" grade or higher or "Pass" in CWS 110 or equivalent course

3 hours lecture

Examines the fundamentals of laboratory analysis with an emphasis on applied chemical and microbiological procedures for water and wastewater plant operators. Includes procedures and techniques used in physical, chemical, bacteriological and biological examination of water/wastewater. Covers State Department of Public Health and Federal EPA, Clean Water and Safe Drinking Water Act regulations related to the operation of a water or wastewater laboratory. Completion of CWS 110 and CWS 210 provides the foundation knowledge and skills necessary to test for the California Water Environment Association (CWEA) Grade 1 Laboratory Analyst Certificate.

CSU

### **212 ADVANCED WATER TREATMENT PLANT OPERATIONS 3 UNITS**

*(formerly WWTR 117)*

Prerequisite: "C" grade or higher or "Pass" in CWS 112 or equivalent

3 hours lecture

The study of water quality control and treatment. Aspects of public health as it relates to the water supply will be highlighted. Sources

of contamination and methods of control will be emphasized as well as maintenance of water treatment facilities, safety, cost, and environmental factors. *Not open to students with credit in WWTR 117.*

CSU

### **214 ADVANCED WASTEWATER TREATMENT PLANT OPERATIONS 3 UNITS**

*(formerly WWTR 120)*

Prerequisite: "C" grade or higher or "Pass" in CWS 114 or equivalent

3 hours lecture

This course examines how modern wastewater treatment plants are operated to maximize efficiency and reliability in processing municipal wastewater. Emphasis on wastewater treatment plant facilities, equipment, preventative maintenance procedures, plant process monitoring & control, and safety & regulatory compliance. *Not open to students with credit in WWTR 120.*

CSU

### **230 ADVANCED WATER DISTRIBUTION SYSTEMS 3 UNITS**

*(formerly WWTR 265)*

Prerequisite: "C" grade or higher or "Pass" in CWS 130 or equivalent

3 hours lecture

The second of an integrated sequence of courses covering water distribution systems. Students will gain a more comprehensive understanding of the operation and maintenance of a water supply and distribution system including advanced calculations, management, safety, and emergency response issues. Contemporary issues facing the water and wastewater industry will be explored in depth. Expands on topics covered in the introductory course, WWTR 130. Part of a series required for eligibility to take the California Department of Public Health (CDPH) Water Distribution Operator certification examinations; prepares students to take and pass CDPH Water Distribution Operator certification examinations for grades D3, D4 and D5. *Not open to students with credit in WWTR 265.*

CSU

### **232 ADVANCED WASTEWATER COLLECTION SYSTEMS 3 UNITS**

*(formerly WWTR 267)*

Prerequisite: "C" grade or higher or "Pass" in CWS 132 or equivalent

3 hours lecture

Provides an in-depth understanding of the operation and maintenance of wastewater collection systems. Includes the design, operation, monitoring, maintenance and repair of collection systems and pump stations; equipment maintenance; safety and survival systems; and administration and organizational principles. *Not open to students with credit in WWTR 267.*

CSU

### **268 MEMBRANE PLANT OPERATION 3 UNITS**

*(formerly WWTR 268)*

Prerequisite: "C" grade or higher or "Pass" in CWS 112 or 114 or equivalent

3 hours lecture

Study of basic membrane technology and the application of this technology to water and wastewater treatment. This course explores the operation and maintenance of membrane components within a water and wastewater treatment system, as well as pre and post treatment. *Not open to students with credit in WWTR 268.*

CSU

### **270 PUBLIC WORKS SUPERVISION 3 UNITS**

*(formerly WWTR 270)*

Prerequisite: "C" grade or higher or "Pass" in CWS 101 or equivalent

3 hours lecture

Introduction to the principles and practices of modern supervision and management with an emphasis on contemporary issues facing supervisors and managers in the water utilities industry. *Not open to students with credit in WWTR 270.*

CSU

### **280 BACKFLOW TESTER TRAINING 2 UNITS**

*(formerly WWTR 280)*

1.5 hours lecture, 1.5 hours laboratory

Preparation for the American Water Works Association (AWWA) and the American Backflow Prevention Association (ABPA) certification for Backflow Prevention Assembly Tester Certification. Includes backflow device installation and testing procedures required for the certification testing. *Not open to students with credit in WWTR 280.*

CSU

### **282 CROSS-CONNECTION CONTROL SPECIALIST 3 UNITS**

*(formerly WWTR 282)*

3 hours lecture

Study of the administrative and technical procedures required for a cross-connection program, including system inspections, hazard evaluation, identification of cross-connection problems and backflow prevention devices, shut-down tests, and reclaimed water systems. *Not open to students with credit in WWTR 282.*

CSU

### **284 CROSS-CONNECTION CONTROL SPECIALIST-RECYCLED WATER 3 UNITS**

*(formerly WWTR 284)*

3 hours lecture

Study of the administrative and technical procedures concerning the production, use and distribution of recycled water including backflow protection, legal, administrative and permitting issues, the treatment process, health and safety aspects, and the cross-connection control (shut down) test as conducted in San Diego County. Various aspects of cross-connection control recycled water shut down testing will be demonstrated. *Not open to students with credit in WWTR 284.*

CSU

### **290 COOPERATIVE WORK EXPERIENCE 1-4 UNITS**

*(formerly WWTR 290)*

Recommended Preparation: Successful completion of at least three Water/Wastewater technology courses prior to enrolling in Cooperative Work Experience is highly recommended.

75 hours paid or 60 hours non-paid work experience per unit, 1-4 units

Practical application of principles and procedures learned in the classroom to the various phases of water and wastewater treatment, distribution or collection. Work experience will be paid or non-paid at appropriate curriculum-related work sites. Two on-campus sessions will be scheduled. *Occupational cooperative work experience credit may accrue at the rate of one to eight units per semester for a total of sixteen units, and students must work 75 paid hours or 60 non-paid hours per unit earned. May be taken for a maximum of 12 units. Not open to students with credit in WWTR 290.*

**Page 128:**

**Comments:**

(Effective Spring 2019)

New course added:

## **ENGLISH AS A SECOND LANGUAGE**

**026 ESL COMPUTER SKILLS INTRODUCTION  
AND VOCABULARY 2 UNITS**

Prerequisite: None

2 hours lecture

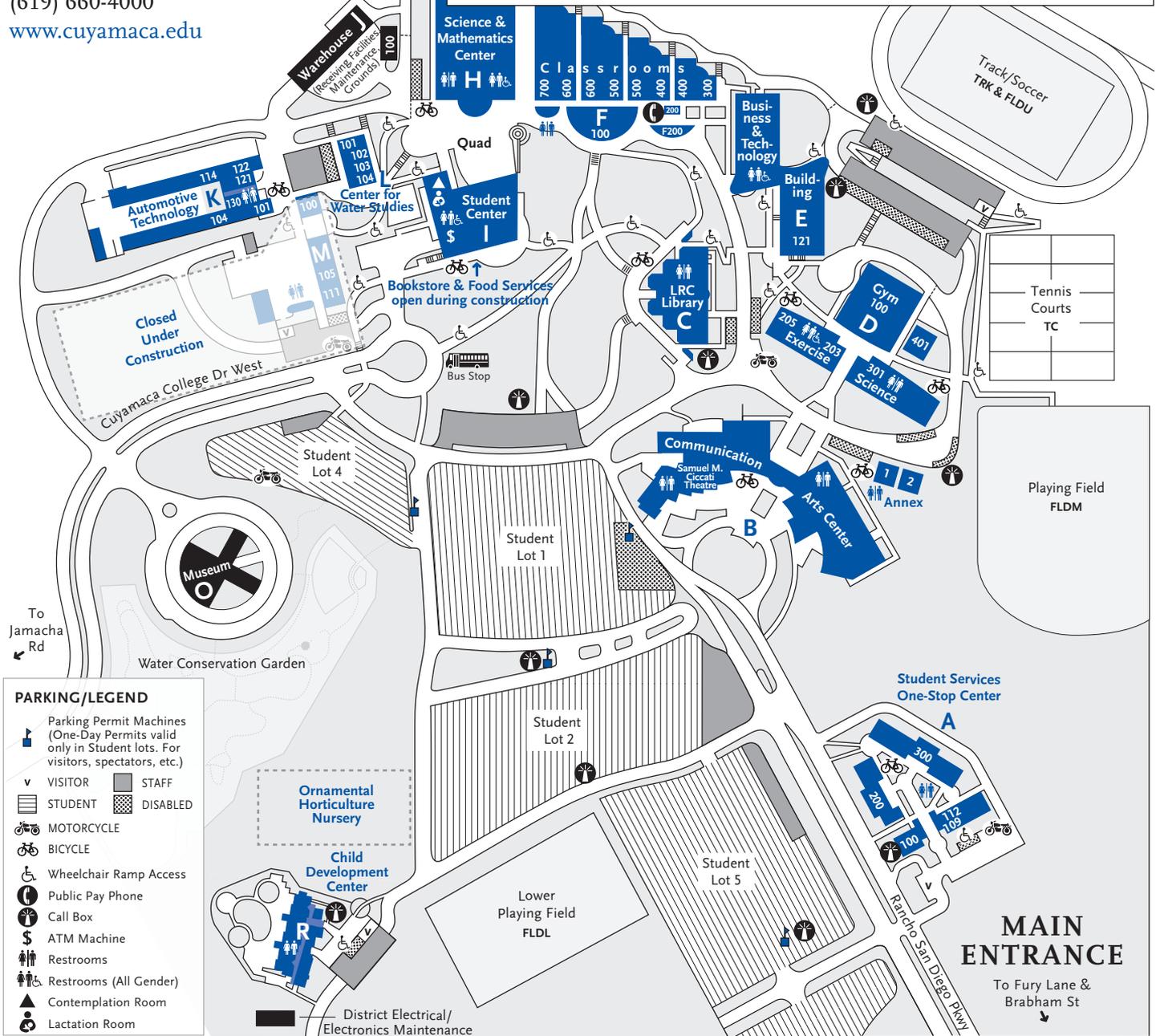
This course is designed as an ESL companion for BOT 100. It focuses on the vocabulary and culture of the computer lab and all the integrated skills needed to successfully submit assignments in future classes. ESL 026 will be "hands-off" any actual computers, emphasizing instead all the language elements that are required for success in a computer skills class teaching proper formatting and software use for preparing assignments. The actual practice of the content of this course will occur in BOT 100, a course which the student must be concurrently enrolled in with ESL 026.

**Pass/No Pass only. Non-degree applicable.**

# CUYAMACA COLLEGE

900 Rancho San Diego Parkway  
 El Cajon, California 92019-4369  
 (619) 660-4000  
[www.cuyamaca.edu](http://www.cuyamaca.edu)

**Building C/Library - reopened**  
**Building I/Heath & Wellness Center - Lactation Room added**  
**Building L/Water Studies - remodeled**



Academic Resource Center - C Bldg  
 Adjunct Faculty Offices - B, E and F Bldgs  
 Administration - F Bldg  
 Admissions & Records - A Bldg  
 Assessment Center - A Bldg  
 Automotive Technology - K Bldg  
 Bookstore - Student Center  
 CalWORKs S.T.E.P.S. - A Bldg  
 CAFYES - A Bldg  
 Campus & Parking Services (CAPS) - A Bldg  
 CARE - A Bldg  
 Career/Placement Center - A Bldg  
 Cashier - A Bldg  
 Center for Water Studies - L Bldg  
 Child Development Center - R Bldg  
 Computer Labs/Tech Mall (Student use) - E Bldg

Counseling - A Bldg  
 DSPS - A Bldg  
 DSPS Learning Lab - C Bldg  
 Duplicating (Faculty Support Services) - F Bldg  
 Environmental Training Center (ETC) - F Bldg  
 EOPS - A Bldg  
 Facilities Office - J-100  
 Financial Aid - A Bldg  
 Fitness Center - D Bldg  
 Food Services - Student Center  
 Gym - D Bldg  
 Health & Wellness Center - I Bldg  
 Heritage of the Americas Museum - O Bldg  
 High School & Community Relations - A Bldg  
 Institutional Effectiveness, Success & Equity - E Bldg

Library (LRC) - C Bldg  
 Mailroom - F Bldg  
 Nursery (Plant Sales) - M Bldg  
 Ornamental Horticulture - closed for construction  
 Pathway Academy - Student Center  
 Samuel M. Ciccati Performing Arts Center - B Bldg  
 Sheriff's Office - A Bldg  
 STEM Achievement Center - H Bldg  
 Student Affairs - A Bldg  
 Student Center - I Bldg  
 Switchboard - F Bldg  
 Transfer Center - A Bldg  
 UP! - A Bldg  
 Veterans Resource Center - Annex 1  
 Veterans Services - A Bldg  
 Writing Center - B Bldg  
 Word Processing (Faculty Support Services) - F Bldg

