Associate Degree Programs and Certificates
## ASSOCIATE DEGREE PROGRAMS AND CERTIFICATES

Courses that satisfy a degree or certificate requirement must be completed with a “C” grade or higher (P/NP grading not accepted).

### APPLIED TECHNOLOGIES

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### ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT

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<td>GRAPHIC DESIGN</td>
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<td>Floral Design</td>
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<td>Golf Course and Sports Turf Management</td>
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<td>Irrigation Technology</td>
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### WATER/WASTEWATER TECHNOLOGY

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### BUSINESS AND ECONOMICS

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<td>Bookkeeping</td>
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### ASSOCIATE DEGREE PROGRAMS AND CERTIFICATES

- Associate Degree for Transfer
- Associate Degree
- Certificate of Achievement
- Certificate of Specialization
ACCOUNTING

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

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Use personal and ethical frameworks to respond to ethical dilemmas.
• Articulate the role of accounting within economic or industry environments through effective communication.
• Demonstrate analytical and information technology skills needed to solve business problems or give recommendations to improve business processes.

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

* Bachelor Degree or higher required

Associate in Science Degree Requirements:

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<tr>
<td>BOT 123-125 Comprehensive Excel Levels I-III 3</td>
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<tr>
<td>BUS 109 Elementary Accounting 3</td>
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<tr>
<td>BUS 120 Financial Accounting 4</td>
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<td>BUS 121 Managerial Accounting 4</td>
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<tr>
<td>BUS 128 Business Communication 3</td>
</tr>
<tr>
<td>BUS 129 Payroll Accounting and Business Taxes 2</td>
</tr>
<tr>
<td>BUS 176 Computerized Accounting Applications 2</td>
</tr>
<tr>
<td>CIS 105 Introduction to Computing 2</td>
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<td>Total Required 19-20</td>
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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.

AMERICAN SIGN LANGUAGE

The Associate in Arts in American Sign Language is designed for students who want to acquire advanced expressive and receptive signing skills, as well as develop a greater awareness of the Deaf community and Deaf culture. The emphasis is on paraprofessional vocations and preparation for continued study in the subject. Upon completion, students may wish to transfer to an Interpreter Certification, American Sign Language, or Deaf Studies program or a four year university to continue their studies. It is recommended that students interested in this certificate contact the department faculty.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Demonstrate information technology skills as they apply to today’s business environment to solve business problems and to communicate those solutions.
• Demonstrate analytical skills through finding, organizing, assessing and analyzing data appropriate to a given situation.
• Provide insightful advisory judgments and recommendations regarding the accounting for and the business implications of events, conditions, circumstances, and transactions that give rise to business opportunities or problems.
• Use personal and ethical frameworks to respond to ethical dilemmas.

Certificate Requirements:

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<th>Course Title Units</th>
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<tbody>
<tr>
<td>ASL 120 American Sign Language I 4</td>
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<tr>
<td>ASL 121 American Sign Language II 4</td>
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<tr>
<td>ASL 130 American Sign Language: Fingerspelling 3</td>
</tr>
<tr>
<td>ASL 140 Inside Deaf Culture 3</td>
</tr>
<tr>
<td>ASL 220 American Sign Language III 4</td>
</tr>
<tr>
<td>ASL 221 American Sign Language IV 4</td>
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Select one unit from the following:

<table>
<thead>
<tr>
<th>Course Title Units</th>
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<tbody>
<tr>
<td>ASL 125 American Sign Language with Infants and Toddlers 1</td>
</tr>
<tr>
<td>ASL 126 American Sign Language with School Age Children 1</td>
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<tr>
<td>Total Required 23</td>
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</table>

Plus General Education Requirements

Certificate of Achievement
This certificate is designed for students who want to acquire advanced expressive and receptive signing skills, as well as develop a greater awareness of the Deaf community and Deaf culture. The emphasis is on paraprofessional vocations and preparation for continued study in the subject. Upon completion, students may wish to transfer to an Interpreter Certification, American Sign Language, or Deaf Studies program or a four year university to continue their studies. It is recommended that students interested in this certificate contact the department faculty.

Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:
• Demonstrate conversational fluency. Students will be able to engage in rich dialogue exchanges and share advanced narratives and complex concepts using ASL.
• Comprehend and use grammar structures and conventions as they apply to dialogue exchanges.
• Demonstrate an understanding of Deaf culture, cultural behaviors, values and norms; clearly explain cultural tenets and interact comfortably and appropriately with Deaf people and the cultural community in a wide range of settings, from personal to professional.
• Demonstrate an understanding of Deaf history, and the significant accomplishments and shifts over time related to the cultural community, medical, technology and education domains.
Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<td>ASL 120</td>
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<tr>
<td>ASL 121</td>
<td>American Sign Language II</td>
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<tr>
<td>ASL 220</td>
<td>American Sign Language III</td>
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<tr>
<td>ASL 221</td>
<td>American Sign Language IV</td>
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Total Required: 16

Select five to six units from the following:

- ASL 125 American Sign Language with Infants and Toddlers: 1
- ASL 126 American Sign Language with School Age Children: 1
- ASL 130 American Sign Language: Fingerspelling: 3
- ASL 140 Inside Deaf Culture: 3

Total Required: 21-22

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

Certificate Requirements:

<table>
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<tr>
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<td>Cultural Anthropology</td>
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<td>ANTH 130</td>
<td>Introduction to Physical Anthropology</td>
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<tr>
<td>ANTH 140</td>
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Associate in Arts for Transfer Degree Requirements:

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<th>Title</th>
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<td>MATH 100</td>
<td>Elementary Statistics</td>
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<tr>
<td>PSY 215</td>
<td>Statistics for the Behavioral Sciences</td>
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List A: (Select 1 course)

- BIO 140 Human Anatomy: 5
- PSY 205 Research Methods in Psychology: 3
- GEOL 110 Planet Earth: 3
- GEOL 111 Planet Earth Laboratory (must be taken if GEOL 110 is selected): 1
- GEOL 104 Earth Science: 3
- GEOG 121 Physical Geography: Earth Systems Laboratory (must be taken if GEOL 104 is selected): 1

List C: (Select 1 course)

- MUS 116 Introduction to World Music: 3
- RELG 120 World Religions: 3
- Total Required: 19-21

General Education Transfer Curriculum

- List A: Select one:
  - ARBC 120 Arabic I: 5
  - ARBC 121 Arabic II: 5
  - ARBC 145 Arabic Civilizations: 3
  - ARBC 122 Arabic for the Native Speaker I or II: 5
  - ARBC 220 Arabic III: 5
  - ARBC 123 Arabic for the Native Speaker II or III: 5
  - ARBC 221 Arabic IV: 5
  - ARBC 250 Conversational Arabic I or II: 3
  - ARBC 254 Conversational Iraqi Dialect: 3
  - ARBC 251 Conversational Arabic II: 3
  - Total Required: 29

- List B: Select 1-2 courses; 3-5 units
  - MATH 160 Elementary Statistics: 4
  - PSY 215 Statistics for the Behavioral Sciences: 4

- RELG 120 World Religions: 3
- MUS 116 Introduction to World Music: 3
- List C: Select one:
  - MUS 116 Introduction to World Music: 3
  - RELG 120 World Religions: 3
- Total Required: 58

Total Degree Units: 60

Program Learning Outcomes

1. Demonstrate an understanding of the core concepts of archaeology, cultural anthropology and physical anthropology;
2. Demonstrate knowledge of cultural variation and diversity of perspectives, practices and beliefs found within and across cultures;
3. Understand long term changes in the conditions that have shaped humans and the environments they inhabit.

Arabic Studies
The Associate in Arts in Arabic Studies is designed to provide a greater understanding of Arabic language, history, culture and heritage, with particular emphasis on reading, writing and speaking the Arabic language. The Arabic Studies degree prepares students for career opportunities that require competency in the Arabic language. Through specific coursework for this degree, students will have a deeper appreciation and understanding of Arabic heritage and civilization.

Program Outcomes
Upon successful completion of this program, students will be able to:
- Communicate in the Arabic language at the intermediate level in a variety of settings.
- Acquire an understanding of Arabic civilization and heritage.
- Gain sensitivity, globalism and cultural competence.

Certificate of Achievement
Students who complete the major requirements above qualify for a Certificate in Arabic Studies. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.
II. STUDIO ARTS FOR TRANSFER (AA-T)
The AA-T in Studio Arts is designed to prepare students to transfer to a California State University (CSU) with the intent of earning a B.A. degree in an area such as Fine Arts or Studio Arts. Students who earn this degree will have the techniques necessary to create a variety of two- and three-dimensional art projects while demonstrating an increased aesthetic awareness. They will have the ability to use visual media to generate ideas, solve visual problems, enhance perception, think, and respond critically to visual information in their lives, identify and describe the historical and cultural contexts of artwork, and assess the role of the visual arts in culture as a vehicle of human expression.

The following is required for the AA-T in Studio Arts 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:

• 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 the artists.
• Analyze 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 have learned in the visual arts across subject areas by developing competencies and creative skills in problem solving, critical thinking, management of time, and identifying resources that contribute to lifelong learning, career skills, and careers in and related to the visual arts.

Associate in Arts Degree Requirements:

Core Curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 120</td>
<td>Two-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 124</td>
<td>Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 129</td>
<td>Three-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 141</td>
<td>History of Western Art I: Circa 1250 A.D. to Present Time</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Degree 60

Total Transferable Elective Units 9-14

IGETC-CSU 37-39

General Education Transfer Curriculum (IGETC) pattern; see Degree Requirements and Transfer Information section for more information.

List A: Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 140</td>
<td>History of Western Art I: Prehistoric to 1250 A.D.</td>
<td>3</td>
</tr>
<tr>
<td>ART 143</td>
<td>Modern Art</td>
<td>3</td>
</tr>
<tr>
<td>ART 144</td>
<td>Architecture of the 20th Century</td>
<td>3</td>
</tr>
<tr>
<td>ART 145</td>
<td>Contemporary Art History: 1945-Present</td>
<td>3</td>
</tr>
<tr>
<td>ART 146</td>
<td>Asian Art</td>
<td>3</td>
</tr>
</tbody>
</table>

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

List B: Select three of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>ART 121</td>
<td>Painting I</td>
<td>3</td>
</tr>
<tr>
<td>ART 125</td>
<td>Drawing II</td>
<td>3</td>
</tr>
<tr>
<td>ART 133</td>
<td>Watercolor</td>
<td>3</td>
</tr>
<tr>
<td>ART 148</td>
<td>Applied Design and Crafts</td>
<td>3</td>
</tr>
<tr>
<td>ART 230</td>
<td>Figure Drawing II</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Major (6 units may be double-counted with GE) 24

Please note: SDSU accepts this degree for students transferring into Art (Studio Arts emphasis).

III. 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 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:

• Research, analyze, organize and formulate artistic order out of chaos.
• Recognize and speak a global visual language and demonstrate an awareness of the meanings and power of symbols and words.
• Design products and services that will make a social and ecological impact.
• Apply elements and principles of design to projects that include packaging, magazine production, and design and production of posters, logos and brochures.
• Formulate decisions about issues of concept, form, imagery, type, printing and methodology.
• Use computer and traditional methods to solve graphic problems.
• Create a professional portfolio that can be used to pursue studies at a four-year university or obtain employment.

CAREER OPPORTUNITIES

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

Associate in Arts Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 120</td>
<td>Two-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 124</td>
<td>Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 125</td>
<td>Drawing II</td>
<td>3</td>
</tr>
<tr>
<td>ART 129</td>
<td>Three-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 140</td>
<td>History of Western Art I: Prehistoric to 1250 A.D.</td>
<td>3</td>
</tr>
<tr>
<td>ART 141</td>
<td>History of Western Art II: Circa 1250 A.D. to Present Time</td>
<td>3</td>
</tr>
<tr>
<td>ART 241</td>
<td>Illustration I</td>
<td>3</td>
</tr>
<tr>
<td>GD 105</td>
<td>Fundamentals of Digital Media</td>
<td>3</td>
</tr>
<tr>
<td>GD 110</td>
<td>Graphic Design Principles</td>
<td>3</td>
</tr>
<tr>
<td>GD 126</td>
<td>Adobe Photoshop Digital Imaging</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required 33

Plus General Education Requirements

Recommended Electives: ART 135, BUS 110, GD 220, MUS 121

IV. ART—DRAWING AND PAINTING

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

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 the past and present cultures throughout the world, noting human diversity as it relates to the visual arts and the artists.
• Analyze, access and derive meaning from works of art, including their own, according to the elements of art, the principles of design and aesthetic qualities.

Associate Degree Programs and Certificates
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 Specialist
* Antique Dealer
* Art Conservator
* Art Therapist
* Arts Administration
* Cartoonist
* Curator
* Display Manager
* Fashion Designer
* Gallery Owner
* Illustrator
* Interior Design
* Jewelry Designer
* Museum Technician
* Painter
* Police Artist
* Set Designer
* Teacher/Professor
* Bachelor Degree or higher required

Associate in Arts Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 120</td>
<td>Two-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 121</td>
<td>Painting I</td>
<td>3</td>
</tr>
<tr>
<td>ART 124</td>
<td>Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 125</td>
<td>Drawing II</td>
<td>3</td>
</tr>
<tr>
<td>ART 140</td>
<td>History of Western Art I: Prehistoric to 1250 A.D.</td>
<td>3</td>
</tr>
<tr>
<td>ART 141</td>
<td>History of Western Art II: Circa 1250 A.D. to Present Time</td>
<td>3</td>
</tr>
<tr>
<td>ART 230</td>
<td>Figure Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>GD 105</td>
<td>Fundamentals of Digital Media</td>
<td>3</td>
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</table>

Select six units from the following:

<table>
<thead>
<tr>
<th>Course</th>
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<th>Units</th>
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</thead>
<tbody>
<tr>
<td>ART 129</td>
<td>Three-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 135</td>
<td>Watercolor I</td>
<td>3</td>
</tr>
<tr>
<td>ART 143</td>
<td>Modern Art</td>
<td>3</td>
</tr>
<tr>
<td>ART 145</td>
<td>Contemporary Art History: 1945-Present</td>
<td>3</td>
</tr>
<tr>
<td>ART 220</td>
<td>Painting II</td>
<td>3</td>
</tr>
<tr>
<td>ART 231</td>
<td>Figure Drawing II</td>
<td>3</td>
</tr>
<tr>
<td>ART 241</td>
<td>Illustration I</td>
<td>3</td>
</tr>
<tr>
<td>ART 242</td>
<td>Illustration II</td>
<td>3</td>
</tr>
<tr>
<td>GD 225</td>
<td>Digital Illustration</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required: 24

Recommended Electives: HIST 105, HUM 155, RELG 120

II. AUTOMOTIVE TECHNOLOGY

The automotive technology curriculum provides for entry level skills in the automotive field. The program is designed to impart in-depth technical skills as required in today’s highly technical automotive field. It prepares students for employment in the automotive and/or transportation trades. For those currently employed, upgrading and specialization skills will be stressed. The major emphasizes practical experience in actual repairs under simulated shop conditions. The program offers two introductory courses that are recommended for all students: AUTO 99 Introduction to Automotive Technology is a lecture class that can be taken face-to-face or fully online. AUTO 100 is a laboratory class that demonstrates how to perform basic services. Students must select one of these courses before taking AUTO 120.

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

- Demonstrate and practice standardized safety and hazardous waste handling practices.
- Diagnose and repair engine mechanical and ignition problems utilizing a variety of diagnostic and repair equipment.
- Evaluate vehicle emission equipment and accurately perform a full smog inspection.
- Diagnose and repair vehicles that fail smog inspections.
- Read and interpret automotive electrical wiring diagrams to aid in the diagnosis of automotive electrical problems.
- Following prescribed industry standards, correctly utilize test equipment and tools to diagnose and repair automotive electrical systems.
- Independently demonstrate ability to perform computer system and fuel system service using related diagnostic equipment.
- Evaluate technical service bulletins for assisting in repairing various drivability concerns.
- Utilize communication skills to effectively deal with disgruntled colleagues in your work place.
- Utilize good customer relations techniques to improve customer satisfaction.
- Correctly adhere to BAR regulations involving writing repair order estimates, revising estimates, and final invoicing.
- Independently apply technical training and skill sets learned at school in an actual automotive repair shop environment.

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

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO 135</td>
<td>Advanced Brakes</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 141*</td>
<td>Emission Control License</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 142*</td>
<td>Emission License Procedures Level II</td>
<td>3</td>
</tr>
<tr>
<td>AUTO 145</td>
<td>Advanced Four-Wheel Alignment</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 155</td>
<td>Advanced Drive Train Systems</td>
<td>4</td>
</tr>
<tr>
<td>AUTO 165</td>
<td>Advanced Air Conditioning and Heating Systems</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 170</td>
<td>Engine Overhaul</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 175</td>
<td>Advanced Engine Overhaul</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 176</td>
<td>Engine Machining</td>
<td>5</td>
</tr>
</tbody>
</table>

Total Required: 25

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO 120</td>
<td>Engine Performance I - Mechanical and Ignition Systems</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 122</td>
<td>Automotive Electrical Systems</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 123</td>
<td>Engine Performance II - Fuel Systems Emission Systems</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 127</td>
<td>Advanced Automotive Electrical Systems</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 130</td>
<td>Automotive Brakes and Brake License</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 180</td>
<td>Automotive Service Advisor</td>
<td>1</td>
</tr>
<tr>
<td>AUTO 182</td>
<td>Automotive Work Experience</td>
<td>3</td>
</tr>
</tbody>
</table>

Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO 124</td>
<td>Engine Performance III - Drivability</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 129</td>
<td>Introduction to Hybrid, Electric and Alternative Fueled Vehicles</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 140</td>
<td>Four-Wheel Alignment</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 152</td>
<td>Drive Train Systems</td>
<td>4</td>
</tr>
<tr>
<td>AUTO 160</td>
<td>Air Conditioning and Heating Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required: 25
Certificate of Achievement
Students who complete the requirements above qualify for a Certificate in Automotive Technology—Advanced Engine Performance and Emissions. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

III. AUTOMOTIVE TECHNOLOGY—ASCCA
The Automotive Service Councils of California Association (ASCCA) sponsored degree program offers a unique, on-the-job training opportunity to those students who are accepted. Training includes all systems of the sponsoring manufacturers’ automobiles. In addition, students will be required to further their studies in a sponsoring dealership as a paid work experience technician. Students who test low in English, reading or math assessment scores (and are accepted into the program) will be required to take remedial courses in those areas in addition to the general education courses. Students who have previous college credit or an associate degree or higher may be exempt from all or part of the general education requirements; please see a counselor.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Perform technical and competent repairs, and professional level diagnosis and descriptions of necessary repairs, of various vehicles and designed systems, for independent dealerships and other affiliated businesses.
• Diagnose analytically, service, and maintain automobiles using recommended procedures, special tools, and service publications, and demonstrate knowledge by properly describing cause, effect, and costs to consumers.
• Graduate and continue university education, and advance in position as an automotive technician, service manager, business owner, engineer, or desired career goals, and by additional experience and education demonstrate capability to master new technology systems and components as they are introduced, and become a leader in the transportation industry.
• Provide customer service and business management expertise by attending various required ASCCA meetings, college courses, and training seminars to promote the ethics standards of the association, and other affiliated professional organizations and businesses.

Associate in Science Degree Requirements:
Course Title Units
AUTO 099 Introduction to Automotive Technology 3
or
AUTO 100 Introduction to Automotive Technology Lab 1
AUTO 122 Automotive Electrical Systems 5
AUTO 123 Engine Performance II Emissions Systems 5
AUTO 129 Introduction to Hybrid Electric Vehicles 5
AUTO 130 Automotive Brakes and Brake License 5
AUTO 140 Four Wheel Alignment 5
AUTO 141 Emission Control License Fundamentals Level I Inspector Training 3
AUTO 142 Emission License Procedures Level II Inspector Training 2
AUTO 182* Automotive Work Experience 12 Total Required 43-45
Plus General Education Requirements

*Note: Automotive work experience classes are from 1 to 4 credit units per semester.

IV. AUTOMOTIVE TECHNOLOGY—ASEP
The General Motors sponsored ASEP degree program offers a unique job training opportunity to those students who are accepted. Training includes all systems of the sponsoring manufacturers’ automobiles. In addition, students will be required to further their studies in a sponsoring dealership as a paid work experience technician. Students who test low in English, reading or math assessment scores (and are accepted into the program) will be required to take remedial courses in those areas in addition to the general education courses. Students who have previous college credit or an associate degree or higher may be exempt from all or part of the general education requirements; please see a counselor.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Demonstrate and practice standardized safety and hazardous waste handling practices.
• Describe the work flow processes utilized by new car dealership service departments.
• Perform lubrication maintenance service and minor maintenance services.
• Perform service repair and diagnosis of vehicle suspension, steering and brake systems utilizing a variety of tools and equipment.
• Retrieve manufacturers’ repair data and specifications and utilize this information for accurate diagnosis and repair.
• Following prescribed industry standards, accurately measure and perform various machining processes on engine components.
• Diagnose and repair engine mechanical and ignition problems utilizing a variety of diagnostic and repair equipment.
• Independently demonstrate ability to perform computer system and fuel system service using related diagnostic equipment.
• Evaluate technical service bulletins for assisting in repairing various drivability concerns.
• Independently demonstrate ability to perform electronic engine diagnostics on both gasoline and diesel engines.
• Following prescribed industry standards, correctly utilize test equipment and tools to diagnose and repair automotive electrical systems.
• Utilizing prescribed industry practices, diagnose, repair, remove and replace air conditioning and heating systems and components.
• Independently apply technical training and skill sets learned at school in an actual automotive repair shop environment.
• Evaluate vehicle emission equipment and accurately perform a full smog inspection.
• Diagnose and repair vehicles that fail smog inspections.

Associate in Science Degree Requirements:
Course Title Units
AUTO 141 Emission Control License Fundamentals Level I Inspector Training 3
AUTO 142 Emission License Procedures Level II Inspector Training 2
AUTO 200 ASEP—Orientation 1
AUTO 201 ASEP—Electrical 6
AUTO 202 ASEP—Brakes and Alignment 7
AUTO 203 ASEP—Engine Repair 4.5
AUTO 204 ASEP—Power Train 7
AUTO 205 ASEP—Engine Performance and Air Conditioning 7
AUTO 206* ASEP—Work Experience 15 Total Required 52.5
Plus General Education Requirements

*Must be taken five times for a total of 15 units.

V. AUTOMOTIVE TECHNOLOGY—ASSET
The Ford sponsored ASSET degree program offers a unique job training opportunity to those students who are accepted. Training includes all systems of the sponsoring manufacturers’ automobiles. In addition, students will be required to further their studies in a sponsoring dealership as a paid work experience technician. Students who test low in English, reading or math assessment scores (and are accepted into the program) will be required to take remedial courses in those areas in addition to the general education courses. Students who have previous college credit or an associate degree or higher may be exempt from all or part of the general education requirements; please see a counselor.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Demonstrate and practice standardized safety and hazardous waste handling practices.
• Describe the work flow processes utilized by new car dealership service departments.
• Prepare new vehicles for customer delivery.
• Perform lubrication maintenance service and minor maintenance services.
• Perform service repair and diagnosis of vehicle suspension, steering and brake systems utilizing a variety of tools and equipment.
• Retrieve manufacturers’ repair data and specifications and utilize this information for accurate diagnosis and repair.
• Following prescribed industry guidelines, diagnose, remove, repair and replace automatic and manual transmissions and transaxles.
• Perform engine repairs to prescribed industry standards.
• Following prescribed industry standards, accurately measure and perform various machining processes on engine components.
• Diagnose and repair engine mechanical and ignition problems utilizing a variety of diagnostic and repair equipment.
• Independently demonstrate ability to perform computer system and fuel system service using related diagnostic equipment.
• Evaluate technical service bulletins for assisting in repairing various drivability concerns.
• Independently demonstrate ability to perform electronic engine diagnostics on both gasoline and diesel engines.
• Following prescribed industry standards, accurately measure and perform various machining processes on engine components.
• Diagnose and repair engine mechanical and ignition problems utilizing a variety of diagnostic and repair equipment.
• Independently demonstrate ability to perform computer system and fuel system service using related diagnostic equipment.
• Evaluate technical service bulletins for assisting in repairing various drivability concerns.
• Independently demonstrate ability to perform electronic engine diagnostics on both gasoline and diesel engines.
• Following prescribed industry standards, correctly utilize test equipment and tools to diagnose and repair automotive electrical systems.
• Utilizing prescribed industry practices, diagnose, repair, remove and replace air conditioning and heating systems and components.
• Independently apply technical training and skill sets learned at school in an actual automotive repair shop environment.
• Evaluate vehicle emission equipment and accurately perform a full smog inspection.
• Diagnose and repair vehicles that fail smog inspections.

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO 141 Emission Control Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>Level I Inspector Training</td>
<td>2</td>
</tr>
<tr>
<td>AUTO 142 Emission License Procedures</td>
<td>2</td>
</tr>
<tr>
<td>Level II Inspector Training</td>
<td>2</td>
</tr>
<tr>
<td>AUTO 190 ASSET-Orientation, PDI and Lubrication</td>
<td>2</td>
</tr>
<tr>
<td>AUTO 191 ASSET-Brakes, Advanced Brakes, Suspension and NVH</td>
<td>7</td>
</tr>
<tr>
<td>AUTO 192 ASSET-Drive Train</td>
<td>8</td>
</tr>
<tr>
<td>AUTO 193 ASSET-Engine Repair</td>
<td>4.5</td>
</tr>
<tr>
<td>AUTO 195 ASSET-Electronic Engine Controls</td>
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<tr>
<td>AUTO 196 ASSET-Electrical, Accessories and Air Conditioning</td>
<td>5</td>
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<tr>
<td>AUTO 197 ASSET-Work Experience</td>
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<td>Total Required</td>
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<tr>
<td>Plus General Education Requirements</td>
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</table>

*Must be taken five times for a total of 13 units.

VI. BRAKES AND FRONT-END

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:
• Demonstrate and practice standardized safety and hazardous waste handling practices.
• Perform various brake system repairs to prescribed industry standards.
• Diagnose and repair Anti-lock Brake systems.
• Using prescribed industry standards, diagnose and repair/replace steering and suspension components.
• Diagnose wheel alignment and tire related problems and align vehicles to industry specifications.
• Utilize communications skills to effectively deal with disgruntled colleagues in your work place.
• Utilize good customer relations techniques to improve customer satisfaction.
• Correctly adhere to BAR regulations involving writing repair orders estimates, revising estimates and final invoicing.
• Independently apply technical training and skill sets learned at school in an actual automotive repair shop environment.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO 120 Engine Performance I - Mechanical and Ignition Systems</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 122 Automotive Electrical Systems</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 162 Drive Train Systems</td>
<td>4</td>
</tr>
<tr>
<td>AUTO 170 Engine Overhaul</td>
<td>5</td>
</tr>
<tr>
<td>AUTO 182 Automotive Work Experience</td>
<td>3</td>
</tr>
<tr>
<td>Total Required</td>
<td>22</td>
</tr>
</tbody>
</table>

Certificate of Achievement

Students who meet the requirements above qualify for a Certificate in Automotive Technology—Brakes and Front-End.

I. BIOLOGY FOR TRANSFER (AS-T)

The Associate in Science in Biology for Transfer presents the diverse, dynamic study of life through a required core of biology and supporting courses. This degree is specifically designed to prepare students for transfer to California State University, where a baccalaureate degree may be earned in Biological Sciences or a closely related field.

The following is required for the AS-T in Biology for Transfer degree:
1. 60 semester or 90 quarter CSU-transferable units;
2. The Intersegmental General Education Transfer Curriculum (IGETC) for Science, Technology, Engineering and Mathematics (STEM) pattern for the CSU;
3. Minimum of 18 semester or 27 quarter units in the major or area of emphasis;
4. Minimum grade point average (GPA) of 2.0;
5. Grade of “C” or better in all courses required for the major or area of emphasis.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:
• Explain the basic structures and fundamental processes of life at the molecular, cellular, and organismal levels.
• Identify the evolutionary processes that lead to adaptation and biological diversity.
• Describe the relationship between life forms and their environment and ecosystems.
• Collect, organize, analyze, interpret and present quantitative and qualitative data and incorporate them into the broader context of biological knowledge.
• Effectively apply current technology and scientific methodologies for problem solving.
• Find, select and evaluate various types of scientific information including primary research articles, mass media sources and World Wide Web information.
• Communicate effectively in written and oral formats.

Associate in Science for Transfer Degree Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 230 Principles of Cellular, Molecular and Evolutionary Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 240 Principles of Ecology, Evolution and Organismal Biology</td>
<td>5</td>
</tr>
<tr>
<td>List A:</td>
<td></td>
</tr>
<tr>
<td>CHEM 141 General Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 142 General Chemistry II</td>
<td>5</td>
</tr>
<tr>
<td>MATH 180 Analytic Geometry and Calculus I</td>
<td>5</td>
</tr>
<tr>
<td>Choose one sequence:</td>
<td></td>
</tr>
<tr>
<td>PHVC 100 Fundamentals of Physics</td>
<td>4</td>
</tr>
<tr>
<td>or PHVC 131 Fundamentals of Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHVC 190 Mechanics and Heat</td>
<td>5</td>
</tr>
<tr>
<td>PHVC 200 Electricity and Magnetism</td>
<td>5</td>
</tr>
<tr>
<td>List B:</td>
<td></td>
</tr>
<tr>
<td>MATH 160 Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>Total Required</td>
<td>36-38</td>
</tr>
<tr>
<td>Double-Counted Units</td>
<td>10</td>
</tr>
<tr>
<td>General Education Requirements (IGETC-CSU for STEM)*</td>
<td>31</td>
</tr>
<tr>
<td>Electives</td>
<td>1-3</td>
</tr>
<tr>
<td>Total Degree Units</td>
<td>39</td>
</tr>
</tbody>
</table>

*Completion of IGETC-CSU for STEM allows for completion of 6 units of non-STEM GE work after transfer. One Area 3 course (Fine Arts and Humanities) and one Area 4 course (Social and Behavioral Sciences) may be deferred until after transfer.

II. BIOLOGICAL SCIENCES

This degree program is designed to provide a two-year transfer program with emphasis on the uniformity and diversity of life. The curriculum fulfills the lower division requirements for majors in biology, dentistry, medicine, nursing, pharmacy, environmental health, microbiology and ecology.
Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Explain the basic structures and fundamental processes of life at the molecular, cellular, and organismal levels.
• Identify the evolutionary processes that lead to adaptation and biological diversity.
• Describe the relationship between life forms and their environment and ecosystems.
• Collect, organize, analyze, interpret and present quantitative and qualitative data and incorporate them into the broader context of biological knowledge.
• Effectively apply current technology and scientific methodologies for problem solving.
• Find, select and evaluate various types of scientific information including primary research articles, mass media sources and World Wide Web information.
• Communicate effectively in written and oral formats.

CAREER OPPORTUNITIES
• Aquatic Biologist
• Athletic Trainer
• Biologist
• Biochemical Engineer
• Biological Technician
• Biomedical Equipment Technician
• Biotechnologist
• Botanist
• Clinical Lab Technician
• Cytologist
• Ecologist
• Environmental Engineer
• Environmental Technician
• Environmental Microbiologist
• Genetic Engineering Technician
• Greenhouse Assistant
• Laboratory Technician
• Physical Therapist
• Public Health Biologist
• Purification Technician
• Research Assistant
• Safety Specialist
• Teacher
• Technical Writer
• Waste Management Technician
• Bachelor Degree or higher required

Associate in Science Degree Requirements:
Course Title Units
BIO 215 Statistics for Life Sciences 3
BIO 230 Principles of Cellular, Molecular and Evolutionary Biology 4
BIO 240 Principles of Ecology, Evolution and Organismal Biology 5
CHEM 141 General Chemistry I 5
CHEM 142 General Chemistry II 5
CHEM 231 Organic Chemistry I 5
MATH 180 Analytic Geometry and Calculus I 5
PHYS 130 Fundamentals of Physics 4
PHYS 131 Fundamentals of Physics 4
Total Required 40
Plus General Education Requirements

III. BIOLOGICAL SCIENCES: PRE-ALLIED HEALTH
This program provides students with a pathway into allied health programs at baccalaureate institutions. Required science courses provide training in the methods of scientific inquiry, the fundamental principles of natural science, and the principle laws and theories governing the physical and life sciences. Recommended general education courses expose students to the necessary base of knowledge that will serve them well in any of the allied health fields. This degree prepares students for transfer to a baccalaureate institution or for advanced studies in an allied health major. Prior to enrolling in several courses in this major, students must take general biology and general biology laboratory as prerequisites. It is recommended that students check with transfer institutions for specific program requirements.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Explain the principles and laws of living systems with particular reference to human disease and human performance, including the role of scientific inquiry in life/medical science, cell theory, the hierarchy of structure and function in living organisms and principles of heredity.
• Describe the normal relationships between structure and function relationships of humans, alterations in normal structure/function that characterize disease; the structure, function, classification and epidemiology of pathogenic microorganisms; and normal cellular and nutritional biochemistry.
• Exhibit competency in the methods used to study living systems, with a focus on human biology including applying principles and procedures of research and experimental design, and gathering, organizing interpreting, evaluating and communicating data.
• Exhibit confidence and ability to function as a health care professional including the ability to conduct independent and collaborative investigation skills, communicate scientific information effectively in oral and written form, and utilize technology effectively and appropriately.
• Exhibit the ability to integrate the content, skills and abilities gained in courses and practice independent, self-directed learning.

Associate in Science Degree Requirements:
Course Title Units
BIO 140 Human Anatomy 5
BIO 141 Human Physiology 3
BIO 141L Laboratory in Human Physiology 1
BIO 152 Paramedical Microbiology 5
CHEM 102 Introduction to General, Organic and Biological Chemistry 5
CHEM 115 & 116 Fundamentals of Chemistry 4
CHEM 116 Introductory Organic and Biochemistry 4
COMM 122 Public Speaking 3
PSY 120 Introductory Psychology 3
SOC 120 Introductory Sociology 3
Total Required 24-31
Plus General Education Requirements
Recommended Electives: CD 125 or PSY 165; MATH 160

BUSINESS

Associate Degree for Transfer™

I. BUSINESS ADMINISTRATION FOR TRANSFER (AS-T)
This program is designed to provide students with the common core of lower division courses required to transfer and pursue a baccalaureate degree in Business Administration. This includes business degrees with options such as accounting, finance, human resources management, international business, management, operations management, and marketing. This major aligns with the California State University (CSU) Bachelor of Science in Business Administration.

The following is required for the AS-T in Business Administration 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.

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 action.

Associate in Science Degree Requirements:
Core Curriculum:
Course Title Units
BUS 120 Financial Accounting 4
BUS 121 Managerial Accounting 4
BUS 125 Business Law: Legal Environment of Business 3
ECON 120 Principles of Macroeconomics 3
ECON 121 Principles of Microeconomics 3

List A: Select one of the following:
MATH 160* Elementary Statistics 4
MATH 178* Calculus for Business, Social and Behavioral Sciences 4

List B: Select two of the following:
BUS 128* Business Communication 3
CIS 110 Principles of Information Systems 4
Any course from List A not selected above* 4

Total Units for Major (9 units may be double-counted with GE) 28-29
Total Units for CSU GE Breadth or IGETC-CSU 37-39
Total Transferable Elective Units 1
Total Units for Degree 60

Students planning to transfer to SDSU are strongly encouraged to complete MATH 160, Math 178, and BUS 128.

Please note: SDSU accepts this degree for students transferring into Business Administration (Financial Services) or Business Administration (General) majors.

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

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

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 120 Financial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>BUS 121 Managerial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>BUS 125 Business Law: Legal Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 128 Business Communication</td>
<td>3</td>
</tr>
<tr>
<td>CIS 110 Principles of Information Systems</td>
<td>4</td>
</tr>
<tr>
<td>ECON 120 Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 121 Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 160 Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>MATH 178 Calculus for Business, Social and Behavioral Sciences</td>
<td>4</td>
</tr>
<tr>
<td>Total Required</td>
<td>32</td>
</tr>
</tbody>
</table>

Recommended Elective: BUS 156

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

III. 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 certificate, students will be able to:
- Demonstrate understanding of the Craft Industry’s environment and its relationship to the many facets of entrepreneurship.
- Demonstrate competency in management practices, in particular business’s role in achieving sustainability, and ethical and civic responsibility.

CAREER OPPORTUNITIES

ENTREPRENEURSHIP OPPORTUNITIES
Small businesses that include:
- Breweries and Brewpubs
- Coffee Shops and Roasters
- Artisan Foods
- Cultivation and Production Management
- Handmade Textiles
- Manufacturing and Production
- Material Suppliers for Artisans

Certificate Requirements:

Core Curriculum:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 112 Craft Entrepreneur</td>
<td>2</td>
</tr>
<tr>
<td>BUS 111 Entrepreneurship: Starting and Developing a Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 125 Business Law: Legal Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 109 Elementary Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BOT 132 Google Applications for Business</td>
<td>3</td>
</tr>
<tr>
<td>Total Required</td>
<td>14</td>
</tr>
</tbody>
</table>

Select at least three units from the following:

Current catalog of courses of these courses is also available for selection.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 107 Office Systems and Procedures</td>
<td>2</td>
</tr>
<tr>
<td>BOT 114 Essential Word</td>
<td>1</td>
</tr>
<tr>
<td>BOT 115 Essential Excel</td>
<td>1</td>
</tr>
<tr>
<td>BOT 117 Essential PowerPoint</td>
<td>1</td>
</tr>
<tr>
<td>BOT 151 Using Microsoft Outlook</td>
<td>1</td>
</tr>
<tr>
<td>Total Required</td>
<td>3</td>
</tr>
</tbody>
</table>

Recommended Elective: BUS 156

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.

IV. CRAFT INDUSTRIES

Certificate of Specialization

The Craft Industries program is designed to provide those entering this highly charged business environment with the basic skills to make it happen. Each student will build their business from the bottom up by understanding the standards and innovative solutions to the practical components of establishing any operational business model. The program is unique; it incorporates the traditional entrepreneurship theory mixed with down-to-earth tools and applications, while keeping in sight its ultimate goal of providing a means for the student to launch their craft business.

Program Learning Outcomes
Upon successful completion of this certificate, 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

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.
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 125-129 Comprehensive Word Levels I-II 3
BOT 174 Computer Concepts and Applications 3
BUS 128 Business Communication 3

Select at least six units from the following:

BOT 119 Windows for the Information Worker 2
BOT 123-125 Comprehensive Excel Levels I-II 3
BOT 223-225 Office Work Experience 1-3
BUS 109 Basic Accounting 3
BUS 120 Financial Accounting 4
BUS 156 Principles of Management 3
BUS 176 Computerized Accounting Applications 2
CIS 140 Databases 6

Total Required 24

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.

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
or
BOT 125-129 Comprehensive Word Levels I-II 3
BOT 115 Essential Excel 1
or
BOT 125-129 Comprehensive Excel Levels I-II 3
BOT 116 Essential Access 1
or
BOT 125-129 Comprehensive Access Levels I-II 3
BOT 117 Essential PowerPoint 1
or
BOT 125-130 Comprehensive PowerPoint Levels I-II 3
BOT 118 Integrated Office Projects 1
BOT 223-225 Office Work Experience 1-3
BUS 128 Business Communication 3

Select at least three units from the following:

BOT 132 Google Applications for Business 3
BUS 109 Elementary Accounting 3
BUS 120 Financial Accounting 4

Total Required 21-28

Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Office Work Experience. 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.

Certificate Requirements

Course Title Units
BOT 120-122 Comprehensive Word Levels I-II 3
BOT 123-125 Comprehensive Excel Levels I-II 3
BOT 128 Comprehensive Access Levels I-II 3
CIS 140 Databases 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

Total Required 19-21

Select at least three units from the following:

BOT 132 Google Applications for Business 3
BUS 109 Elementary Accounting 3
BUS 115 Human Relations in Business 3
BUS 120 Financial Accounting 4
BUS 125 Business Law: Legal Environment of Business 3

Select at least one unit from the following:

BOT 102AB Building Keyboarding Skill I, II, III 5
BOT 119 Windows for the Information Worker 2
BUS 150 Using Microsoft Publisher 1
BUS 151 Using Microsoft Outlook 1
BUS 109 Elementary Accounting 3
BUS 120 Financial Accounting 4

Total Required 23-25

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.

CERTIFICATE OF ACHIEVEMENT

1. BUSINESS INFORMATION WORKER

The Business Information Worker Certificate of Achievement is a job readiness pathway or certificate for office workers, developed in conjunction with local employers. Enrolled students are prepared in a broad range of entry-level office skills and applications which promote success in a variety of office environments. Essential components of the curriculum include a solid foundation in Microsoft Windows and Office, as well as critical thinking, problem solving, and interpersonal skills.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:
- Use computer input devices to properly and efficiently create and edit documents in word processing and spreadsheet programs, such as Word and Excel, and electronic communications such as email.
- Work effectively, respectfully, ethically and professionally with people of diverse ethnic, cultural, gender and other backgrounds, and with people of different organizational roles, social affiliations, and personalities.
- Communicate effectively and professionally in business situations through physical or virtual presence, writing, speaking, and electronic media.

Certificate Requirements

Course Title Units
BOT 100 Basic Keyboarding 1
BOT 114 Essential Word 1
BOT 115 Essential Excel 1
BOT 119 Windows for the Information Worker 2
BOT 151 Using Microsoft Outlook 1
BUS 115 Human Relations in Business 3
BUS 128 Business Communication 3
CIS 110 Principles of Information Science 4

Total Required 16

Certificate of Achievement

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

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.

I. ACCOUNT CLERK

This certificate prepares a beginning student to work in a job that requires bookkeeping skills as well as an ability to provide account clerk support using accounting software. Many jobs at the entry level are available for someone who has training in these two areas.

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:
- Explain the basic concepts of using computerized accounting software in the relevant field of business.
- Appropriately use the vocabulary and accounting procedures specific to the workplace.
- Use computer input devices, e.g., keyboard or mouse, to efficiently and competently use accounting software specific to the relevant field of business.
IV. OFFICE ASSISTANT LEVEL II
This certificate is designed for students who have completed the Office Assistant Level I certificate or have the equivalent in keyboarding and computer skills. It prepares students for advancement in office careers which knowledge of Microsoft Office applications is required.

Program Learning Outcomes
Upon successful completion of this certificate, 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.

Certificate Requirements:

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

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

Program Learning Outcomes
Upon successful completion of this certificate, 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.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 100 Basic Keyboarding</td>
<td>1</td>
</tr>
</tbody>
</table>
| or
| BOT 101AB Keyboarding/Document Processing I-II | 3 |
| or
| BOT 102AB Intermediate Keyboarding/Document Processing I-II | 3 |
| or
| BOT 107 Office Systems and Procedures | 2 |
| or
| BOT 114 Essential Word | 1 |
| or
| BOT 115 Essential Excel | 1 |
| or
| BOT 223 Office Work Experience | 1 |
| or
| BOT 224 Office Work Experience | 2 |
| BUS 110 Introduction to Business | 3 |
| BUS 128 Business Communication | 3 |
| Total Required | 12-15 |

VI. OFFICE SOFTWARE SPECIALIST LEVEL I
This certificate is designed for students interested in working in an administrative support capacity who need working knowledge of word processing, electronic spreadsheet, database and presentation software as well as software integration techniques. Students who complete the certificate may continue taking courses to earn the Executive Assistant Certificate of Achievement.

Program Learning Outcomes
Upon successful completion of this certificate, 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.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 100 Basic Keyboarding</td>
<td>1</td>
</tr>
</tbody>
</table>
| or
| BOT 101AB Keyboarding/Document Processing I-II | 3 |
| or
| BOT 102AB Intermediate Keyboarding/Document Processing I-II | 3 |
| or
| BOT 107 Office Systems and Procedures | 2 |
| or
| BOT 114 Essential Word | 1 |
| or
| BOT 115 Essential Excel | 1 |
| or
| BOT 223 Office Work Experience | 1 |
| or
| BOT 224 Office Work Experience | 2 |
| BUS 110 Introduction to Business | 3 |
| BUS 128 Business Communication | 3 |
| Total Required | 12-15 |

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 109 Elementary Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BUS 120 Financial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>BUS 176 Computerized Accounting Applications</td>
<td>2</td>
</tr>
<tr>
<td>Total Required</td>
<td>8-9</td>
</tr>
</tbody>
</table>

II. FRONT OFFICE RECEPTIONIST
This certificate would provide an entry-level employment opportunity for a student that finishes the following courses. These skills are aimed at a student who is seeking a front office receptionist-related position in an office. This certificate prepares a beginning student to work in a job that requires basic keyboarding skills, a basic knowledge of filing, and basic office procedures necessary for meeting and greeting the public in person, by telephone, and electronically.

Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:
• Use computer input devices, e.g., keyboard or mouse, to efficiently and competently use the software specific to the relevant field of business.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 100 Basic Keyboarding</td>
<td>1</td>
</tr>
</tbody>
</table>
| or
| BOT 103AB Building Keyboarding Skill I-II | 1 |
| or
| BOT 104 Filing and Records Management | 1 |
| or
| BOT 107 Office Systems and Procedures | 2 |
| or
| BOT 151 Using Microsoft Outlook | 1 |
| or
| BOT 174 Computer Concepts and Applications | 3 |
| Total Required | 8 |

III. OFFICE ASSISTANT LEVEL I
This certificate prepares students for positions that require keyboarding skills, basic knowledge of filing, and basic computer skills. It is designed for students with no prior computer training and who lack general office background and experience. Upon completion, students will qualify for positions as data entry clerks or other entry level office clerical positions.

Program Learning Outcomes
Upon successful completion of this certificate, 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.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 104 Filing and Records Management</td>
<td>1</td>
</tr>
</tbody>
</table>
| or
| BOT 107 Office Systems and Procedures | 2 |
| or
| BOT 151 Using Microsoft Outlook | 1 |
| or
| BOT 174 Computer Concepts and Applications | 3 |
| Total Required | 8 |

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 101AB Keyboarding/Document Processing I-II</td>
<td>3</td>
</tr>
</tbody>
</table>
| or
| BOT 102AB Intermediate Keyboarding/Document Processing I-II | 3 |
| or
| BOT 107 Office Systems and Procedures | 2 |
| or
| BOT 114 Essential Word | 1 |
| or
| BOT 115 Essential Excel | 1 |
| or
| BOT 116 Essential Access | 1 |
| or
| BOT 117 Essential PowerPoint | 3 |
| Total Required | 9 |

VII. OFFICE SOFTWARE SPECIALIST LEVEL II
This certificate is designed for students interested in working in an administrative support capacity who need working knowledge of word processing, electronic spreadsheet, database and presentation software as well as software integration techniques. Students who complete the certificate may continue taking courses to earn the Executive Assistant Certificate of Achievement.

Program Learning Outcomes
Upon successful completion of this certificate, 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.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 100 Basic Keyboarding</td>
<td>1</td>
</tr>
</tbody>
</table>
| or
| BOT 101AB Keyboarding/Document Processing I-II | 3 |
| or
| BOT 102AB Intermediate Keyboarding/Document Processing I-II | 3 |
| or
| BOT 107 Office Systems and Procedures | 2 |
| or
| BOT 114 Essential Word | 1 |
| or
| BOT 115 Essential Excel | 1 |
| or
| BOT 116 Essential Access | 1 |
| or
| BOT 117 Essential PowerPoint | 1 |
| or
| BOT 129-130 Comprehensive PowerPoint, Levels I-II | 2 |
| Total Required | 5-9 |
CADD TECHNOLOGY

Occupational preparation in Computer-Aided Drafting and Design is the primary purpose of the CADD Technology degree program. Students are required to complete two core courses and to select from two potential career paths: Building Design Industry or Manufacturing Industry. Adherence to industrial practices and standards is stressed, including problem solving in a simulated industrial environment.

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

- Create 3D modeling objects of various orientations including sections and elevations of objects, and identify the relationships of objects or object features to demonstrate visualization proficiency.
- Identify or describe the typical characteristics and uses of common construction or manufacturing materials, products and systems, document them in drawings, and make appropriate selections based on design project requirements.
- Use the latest version of 2D/3D CADD and Solid Modeling software programs (AutoCAD and SolidWorks) to create industry standard architectural or engineering drawings.
- Model the habits and attitudes for success in professional employment as a CADD technician including the preparation and presentation of a professional portfolio.
- Demonstrate computation, communication, critical thinking, and problem-solving skills to perform effectively as a CADD technician in the field of architecture and/or the civil, electronic, mechanical, structural, and surveying engineering fields.

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

Associate in Science Degree Requirements:

Core Curriculum:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CADD 115 Engineering Graphics</td>
<td>3</td>
</tr>
<tr>
<td>CADD 120 Introduction to Computer-Aided Drafting and Design</td>
<td>3</td>
</tr>
<tr>
<td>CADD 127 Survey Drafting Technology</td>
<td>3</td>
</tr>
<tr>
<td>CADD 131 Architectural Computer-Aided Drafting and Design</td>
<td>3</td>
</tr>
<tr>
<td>CADD 133 Advanced Architectural Computer-Aided Drafting and Design</td>
<td>3</td>
</tr>
<tr>
<td>CADD/OH 200 Introduction to Computer-Aided Landscape Design</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required Including Core Classes: 24

Plus General Education Requirements: 6

Certificate of Achievement

Select four of the following:

CADD/OH 201 3D Solid Modeling 3
CADD 126 Electronic Drafting 3
CADD 128 Geometric Dimensioning and Tolerancing (GD&T) 3
CADD/OH 135 Advanced Computer-Aided Drafting and Design in 3D Modeling 3

Total Required Including Core Classes: 12

Select two of the following:

CADD 127 Survey Drafting Technology 3
CADD 131 Architectural Computer-Aided Drafting and Design 3
CADD 133 Advanced Architectural Computer-Aided Drafting and Design 3
CADD/OH 200 Introduction to Computer-Aided Landscape Design 3

B. MANUFACTURING INDUSTRY

Select four of the following:

CADD/OH 201 3D Solid Modeling 3
CADD 126 Electronic Drafting 3
CADD 128 Geometric Dimensioning and Tolerancing (GD&T) 3
CADD/OH 135 Advanced Computer-Aided Drafting and Design in 3D Modeling 3
CADD 132 Advanced Computer-Aided Drafting and Design 3

Total Required Including Core Classes: 12

Select two of the following:

CADD 127 Survey Drafting Technology 3
CADD 131 Architectural Computer-Aided Drafting and Design 3
CADD 133 Advanced Architectural Computer-Aided Drafting and Design 3
CADD/OH 200 Introduction to Computer-Aided Landscape Design 3

Total Required Including Core Classes: 6

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

- Demonstrate knowledge of the habits and attitudes for success in professional employment as a CADD technician.
- Identify or describe the typical characteristics and uses of common construction or manufacturing materials, products and systems, document them in drawings, and make appropriate selections based on design project requirements.
- Model the habits and attitudes for success in professional employment as a CADD technician including the preparation and presentation of a professional portfolio.
- Demonstrate computation, communication, critical thinking, and problem-solving skills to perform effectively as a CADD technician in the field of architecture and/or the civil, electronic, mechanical, structural, and surveying engineering fields.

CHEMISTRY

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

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

- Comprehend and describe the nature of matter, including its classification, composition and structure.
- Demonstrate an understanding of the transformations of matter, both physical and chemical.
- Develop critical thinking skills by predicting interactions between different types of matter, both physical and chemical.

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

* Agricultural Chemist
* Air Quality Control
* Analytical Chemist
* Biochemist
* Chemistry Teacher
* Dietician
* Environmental Technologist
* Fishery Specialist
* Food And Drug Inspector
* Forensic Specialist
* Laboratory Technician
* Materials Scientist
* Medical Technologist
* Microbiologist
* Organic Chemist
* Physician
* Polymer Chemist
* Sales Representative
* Sanitarian Technician
* Bachelor Degree or higher required
II. EARLY CHILDHOOD EDUCATION FOR TRANSFER (AS-T)

The AS-T in Early Childhood Education is designed to prepare students planning to transfer to a California State University for a bachelor’s degree in Child Development or Early Childhood Education by providing lower division course preparation. This degree facilitates a clearly defined career pathway for students wishing to pursue a career in early childhood development and care.

The following is required for the AS-T in Early Childhood Education for Transfer degree:

1. Minimum of 60 semester or 90 quarter units of 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:

- Integrate the key developmental concepts and teaching strategies into a cogently articulated philosophy of early childhood education and care.
- Employ curriculum that is well planned, developmentally appropriate and based on the interests and needs of children and adolescents.
- Implement effective guidance strategies with children and adolescents.
- Demonstrate the ability to plan programs for children and adolescent which enhance their physical, intellectual, emotion and social development.

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 122</td>
<td>General Chemistry II</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 231</td>
<td>Organic Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>MATH 180</td>
<td>Analytic Geometry and Calculus I</td>
<td>5</td>
</tr>
<tr>
<td>MATH 280</td>
<td>Analytic Geometry and Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 281</td>
<td>Multivariable Calculus</td>
<td>4</td>
</tr>
<tr>
<td>PHYC 190</td>
<td>Mechanics and Heat</td>
<td>5</td>
</tr>
<tr>
<td>PHYC 200</td>
<td>Electricity and Magnetism</td>
<td>5</td>
</tr>
<tr>
<td>PHYC 210</td>
<td>Wave Motion and Modern Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Required: 43

Plus General Education Requirements

I. CHILD DEVELOPMENT

The Associate in Arts in Child and Adolescent Development for Transfer is designed to provide students with the lower division course preparation needed to transfer to a California State University for a bachelor’s degree in Child Development or Child and Adolescent Development or a closely related field.

Program Learning Outcomes

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

- Implement effective guidance strategies with children and adolescents.
- Survey, assemble, and expand curricula resources for specific early childhood classrooms and centers.
- Apply and implement effective and sensitive discipline and guidance strategies directly with children.
- Clearly demonstrate the ability to plan child development programs which deliberately intend to advance, stimulate or otherwise enhance children’s physical, intellectual, emotional and social development in ways which are appropriate to the children’s developmental level.
- Assess their own professional competence and progress and develop a plan for professional career steps and growth.

Associate Degree for Transfer

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 121</td>
<td>Practicum in Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>CD 213</td>
<td>Observation and Assessment</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Degree: 60

III. CHILD DEVELOPMENT

The Child Development curriculum is designed to prepare students for employment as teachers, directors and aides in preschools and child care centers, including infant/toddler and extended day facilities. The curriculum is also appropriate for parents, administrators, health care professionals, and others working with children. Course work meets the educational components of the Department of Social Services license regulations for child care programs. The degree meets the Title 5 Department of Education educational requirements of the Assistant, Associate, Teacher, Master Teacher and Site Supervisor Child Development Permits. The curriculum meets lower division course preparation for students planning to obtain a bachelor’s degree in Child Development at most CSU campuses.

The Department of Social Services Title 22 minimum requirements to be a preschool teacher are 12 units in Child Development which must include: CD 125, CD 131, one curriculum class (CD 123, 126, 127, 128, 129 or 130), 12 additional units in CD, and 16 units of general education which must include one degree applicable course in each of four general education categories: English/Language Arts; Math or Science; Social Sciences; Humanities and/or Fine Arts.

The California Community Colleges’ Curriculum Alignment Project (CAP) consolidates and clarifies the transfer requirements for teachers of young children in the state of California. The eight CAP courses, CD 123, 125, 130, 131, 153, 212 and 213, provide a strong foundation for transfer to four-year programs in Child Development of Early Childhood Education.

Program Learning Outcomes

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

- Integrate the key developmental concepts and teaching strategies into a cogently articulated philosophy of early childhood education and care.
- Employ appropriate classroom organizational and management techniques in a variety of early childhood education settings, including the implementation of curriculum that is well planned, developmentally appropriate, and based on the interests and needs of the children.
- Survey, assemble, and expand curricula resources for use in specific early childhood classrooms and centers.
- Apply and implement effective and sensitive discipline and guidance strategies directly with children.
- Clearly demonstrate the ability to plan child development programs which deliberately intend to advance, stimulate or otherwise enhance children’s physical, intellectual, emotional and social development in ways which are appropriate to the children’s developmental level.
- Assess their own professional competence and progress and develop a plan for professional career steps and growth.

Associate Degree for Transfer

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 121</td>
<td>Practicum in Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>CD 213</td>
<td>Observation and Assessment</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Degree: 60

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 123</td>
<td>Principles and Practices of Programs and Curriculum for Young Children</td>
<td>3</td>
</tr>
<tr>
<td>CD 125</td>
<td>Child Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 130</td>
<td>Curriculum: Design and Implementation</td>
<td>3</td>
</tr>
<tr>
<td>CD 131</td>
<td>Child, Family and Community</td>
<td>3</td>
</tr>
<tr>
<td>CD 134</td>
<td>Health, Safety and Nutrition of Young Children</td>
<td>3</td>
</tr>
<tr>
<td>CD 153</td>
<td>Teaching in a Diverse Society</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required: 60

Additional Course Options

List A: (Choose 9 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 125</td>
<td>Child Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 131</td>
<td>Child, Family and Community</td>
<td>3</td>
</tr>
<tr>
<td>CD 134</td>
<td>Health, Safety and Nutrition of Young Children</td>
<td>3</td>
</tr>
<tr>
<td>CD 153</td>
<td>Teaching in a Diverse Society</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Major (6 units may be double-counted with GE) 24

Total Transferable Elective Units 3-5

Total Units for Degree 60

Associate in Arts for Transfer Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 125</td>
<td>Child Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 131</td>
<td>Child, Family and Community</td>
<td>3</td>
</tr>
<tr>
<td>CD 134</td>
<td>Health, Safety and Nutrition of Young Children</td>
<td>3</td>
</tr>
<tr>
<td>CD 153</td>
<td>Teaching in a Diverse Society</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required: 43

Plus General Education Requirements

Total Degree Units 60
emotional and social development in ways which are appropriate to the children’s developmental level.

- Assess their own professional competence and progress and develop a plan for professional career steps and growth.

**CAREER OPPORTUNITIES**
- Adoption Counselor
- Camping Guide
- Child Care Specialist
- Child Psychologist
- Curriculum Development
- Development Specialist (Child, Adolescent and Family)
- Early Intervention Aide
- Educational Consultant
- Infant/Toddler Teacher
- Outdoor Education Specialist
- Preschool Director
- Preschool Teacher
- Recreation Leader
- Recreation Specialist
- School Age Child Care Teacher
- Social Service Specialist
- Special Education Assistant – Children with Special Needs
- Bachelor Degree or higher required

**Associate in Science Degree Requirements:**

**Core Curriculum:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 106</td>
<td>Practicum: Beginning Observation and Experience</td>
<td>1</td>
</tr>
<tr>
<td>CD 123</td>
<td>Principles and Practices of Programs and Curriculum for Young Children</td>
<td>3</td>
</tr>
<tr>
<td>CD 125</td>
<td>Child Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 126</td>
<td>Art for Child Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 127</td>
<td>Science and Mathematics for Child Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 128</td>
<td>Music and Movement for Child Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 129</td>
<td>Language and Literature for Child Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 131</td>
<td>Child, Family and Community</td>
<td>3</td>
</tr>
<tr>
<td>CD 134</td>
<td>Health, Safety and Nutrition of Young Children</td>
<td>3</td>
</tr>
<tr>
<td>CD 141</td>
<td>Working with Children with Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD 210</td>
<td>Working with Young Children with Challenging Behaviors</td>
<td>3</td>
</tr>
<tr>
<td>CD 153</td>
<td>Teaching in a Diverse Society</td>
<td>3</td>
</tr>
</tbody>
</table>

**Areas of Emphasis:**

**A. INFANTS AND TODDLERS**

- CD 124 Infant and Toddler Development 3
- CD 132 Observation and Assessment: Field Experience Seminar 3
- CD 143 Responsive Planning for Infant/Toddler Care 3
- CD 170 Practicum: Field Experience with Infants and Toddlers 2

Total Required Including Core Courses: 11

**B. PRESCHOOL CHILDREN**

- CD 130 Curriculum: Design and Implementation 3
- CD 132 Observation and Assessment: Field Experience Seminar 3
- CD 133 Practicum-Field Experience: Student Teaching 2

Total Required Including Core Courses: 39

**Certificate of Achievement**

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

**CERTIFICATES OF SPECIALIZATION: ADMINISTRATION**

This certificate offers specific training for individuals who are seeking a position as the director of a California Title 22 early childhood development program. Students who complete the requirements below qualify for a Certificate in Child Development: Administration. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

**Program Learning Outcomes**

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

- Develop and manage the budget for a child care or preschool program.
- Incorporate regulatory laws into planning for a preschool program.
- Develop and apply school policies and procedures, including those related to personnel and families.

**CAREER OPPORTUNITIES**

Students may find positions as the director or assistant director of early childhood programs licensed by California Title 22 for children from 2-5 years. Students wanting to direct programs that include infants and toddlers from birth-2 years should take a Child Development course specifically related to infants and toddlers (CD 124 or 143).

**Certificate Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 125</td>
<td>Child Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 131</td>
<td>Child, Family and Community</td>
<td>3</td>
</tr>
</tbody>
</table>

**Select two of the following:**

- CD 126 Art for Child Development 3
- CD 127 Science and Mathematics for Child Development 3
- CD 128 Music and Movement for Child Development 3
- CD 129 Language and Literature for Child Development 3
- CD 131 Child, Family and Community 3
- CD 145 Child Abuse and Family Violence in Our Society 3
- CD 210 Working with Children with Challenging Behaviors 3

Total Required: 15

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

At least 50% of the units required for the Certificate of Specialization must be completed at Cuyamaca College.

**COMMUNICATION**

**I. COMMUNICATION STUDIES FOR TRANSFER (AA-T)**

This degree program is designed to provide students with a broad base of communication courses that provide training for entry into occupations in which public contact and verbal skills are important. Students will explore and analyze verbal communication methods, as well as develop and advance their oral communication skills. Students completing this degree may be interested in pursuing careers in community service, sales, performing arts, teaching, and other communication professions.
The following is required for the AA-T in Communication Studies 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:

- Research, write and deliver an effective public speech.
- Analyze, critique, and improve interpersonal relationships in both personal and professional contexts.
- Describe and apply specific skills to the communication process, including perception, emotion, listening and conflict management.
- Describe and interpret communication similarities and differences between people from varying cultural backgrounds.
- Interact with others in group settings to collect, analyze, and synthesize information.
- Interact respectfully with others who hold divergent perspectives.
- Critically analyze, critique and synthesize arguments and information.

Associate in Arts Degree Requirements:

**Core Curriculum:**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 122 Public Speaking</td>
<td>3</td>
</tr>
</tbody>
</table>

**List A: Select two of the following:**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 120 Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 137 Critical Thinking in Group Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 145 Argumentation</td>
<td>3</td>
</tr>
</tbody>
</table>

**List B: Select two of the following:**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110 Introduction to Mass Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 124 Intercultural Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 240 Speech and Debate Competition III</td>
<td>3</td>
</tr>
<tr>
<td>Any course from List A not selected above</td>
<td>3</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 120 Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 122 Introduction to Literature</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 124 Advanced Composition: Critical Reasoning and Writing</td>
<td>3</td>
</tr>
<tr>
<td>SOC 120 Introductory Sociology</td>
<td>3</td>
</tr>
<tr>
<td>Any course from Lists A or B not selected above</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Major: 18
Total Units for CSU GE Breadth or IGETC-CSU: 37-39
Total Transferable Elective Units: 3
Total Units for Degree: 60

Please note: SDSU accepts this degree for students transferring into the Health Communication Major and the Communication Major in Applied Arts and Sciences emphases.

II. COMMUNICATION

This degree program is designed to provide students with a broad base of communication classes that provide training for entry into occupations in which verbal skills are important. Major requirements for the four-year degree in Communication vary from institution to institution. It is recommended that students check with transfer institutions for specific requirements.

Program Learning Outcomes

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

- Research, write and deliver an effective public speech.
- Analyze, critique, and improve interpersonal relationships in both personal and professional contexts.
- Describe and apply specific skills to the communication process, including perception, emotion, listening and conflict management.
- Describe and interpret communication similarities and differences between people from varying cultural backgrounds.
- Interact with others in group settings to collect, analyze, and synthesize information.
- Interact respectfully with others who hold divergent perspectives.
- Critically analyze, critique and synthesize arguments and information.

CAREER OPPORTUNITIES

Advertising Assistant
Announcer
Arts Administrator
Communication Consultant
Journalist
Lawyer
Lobbyist
Narrator
Politician
Public Information Officer
Public Relations Assistant
Teacher/Instructor/College Professor

Associate in Arts Degree Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110 Introduction to Mass Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 129 Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 122 Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>COMM 123 Advanced Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>COMM 145 Argumentation</td>
<td>3</td>
</tr>
</tbody>
</table>

**Select six units from the following:**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 124 Intercultural Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 128 Global Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 137 Critical Thinking in Group Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 144 Communication Studies: Race and Ethnicity</td>
<td>3</td>
</tr>
</tbody>
</table>

**Select three units from the following:**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 130 Fundamentals of Human Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 135 Oral Interpretation of Literature</td>
<td>3</td>
</tr>
<tr>
<td>COMM 136 Readers Theatre</td>
<td>3</td>
</tr>
<tr>
<td>COMM 238 Speech and Debate Competition I</td>
<td>1</td>
</tr>
<tr>
<td>COMM 239 Speech and Debate Competition II</td>
<td>2</td>
</tr>
<tr>
<td>COMM 240 Speech and Debate Competition III</td>
<td>3</td>
</tr>
<tr>
<td>COMM 241 Speech and Debate Competition IV</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Major: 18
Total Units for CSU GE Breadth or IGETC-CSU: 37-39
Total Transferable Elective Units: 3
Total Units for Degree: 60

Similar Course List:

The following Cuyamaca and Grossmont College courses are considered similar enough to be accepted in the major for local computer science degrees in the district. Modification of Major forms are not required.

**Similar Cuyamaca Course**   **Grossmont Course**
CSIS 105   CSIS 172
CSIS 119   CSIS 132
CSIS 120   CSIS 144
CSIS 121   CSIS 133
CSIS 140   CSIS 180
CSIS 190   CSIS 112
CSIS 191   CSIS 113
CSIS 211   CSIS 132
CSIS 213   CSIS 133
CSIS 215   CSIS 135
CSIS 240   CSIS 276
CSIS 287   CSIS 281, 282
CSIS 288   CSIS 297
CSIS 297   CSIS 294

*Offered at Grossmont College

Please note: SDSU accepts this degree for students transferring into the Health Communication Major and the Communication Major in Applied Arts and Sciences emphases.
I. NETWORKING, SECURITY AND SYSTEM ADMINISTRATION

These degree programs prepare students for careers in computer networking or system administration and related fields. Upon completion, students may find entry level positions as computer support technicians, junior network administrators, junior system administrators, hardware technicians, data/voice/video cabling technicians, network project managers, designers/estimators or technical support personnel. The major prepares students to work as team members in an information technology group which designs, evaluates, tests, installs and maintains corporate networks. Preparation for the following industry certifications: A+, Network+, Security+, Linux+, Microsoft Certified Technician (MCT) in Windows and Windows Server (active directory, network infrastructure and applications infrastructure), Linux Professional Institute Certification Level 2, Certified Wireless Network Administrator (CWNA), Cisco Certified Network Associate (CCNA), Certified Ethical Hacking (CEH).

A. NETWORKING, SECURITY AND SYSTEM ADMINISTRATION - ENTERPRISE NETWORKING

Program Learning Outcomes

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

- Install, configure, upgrade, diagnose and troubleshoot a personal computer and its associated networking hardware and software in accordance with industry standards.

Associate in Science Degree Requirements: Core Curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 120</td>
<td>Computer Maintenance and A+ Certification</td>
<td>3</td>
</tr>
<tr>
<td>CIS 121</td>
<td>Network Cabling Systems</td>
<td>3</td>
</tr>
<tr>
<td>CIS 125</td>
<td>Network+ Certification</td>
<td>3</td>
</tr>
<tr>
<td>CIS 119</td>
<td>Program Design and Development</td>
<td>3</td>
</tr>
<tr>
<td>CIS 119L</td>
<td>Program Design and Development Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

Area of Emphasis:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 190</td>
<td>Windows Operating System</td>
<td>3</td>
</tr>
<tr>
<td>CIS 191</td>
<td>Linux Operating System</td>
<td>3</td>
</tr>
<tr>
<td>CIS 209</td>
<td>Windows Server-Installing and Configuring</td>
<td>2</td>
</tr>
<tr>
<td>CIS 291</td>
<td>Linux System Administration</td>
<td>3</td>
</tr>
<tr>
<td>CIS 293</td>
<td>Windows Server-Administering</td>
<td>2</td>
</tr>
<tr>
<td>CIS 294</td>
<td>Windows Server-Advanced Configuration</td>
<td>2</td>
</tr>
</tbody>
</table>

Select four of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 140</td>
<td>Databases</td>
<td>3</td>
</tr>
<tr>
<td>CIS 162</td>
<td>Technical Diagramming Using Microsoft Visio</td>
<td>2</td>
</tr>
<tr>
<td>CIS 261</td>
<td>NSSA Degree Capstone</td>
<td>2</td>
</tr>
<tr>
<td>CIS 263</td>
<td>Fundamentals of Network Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 264</td>
<td>Ethical Cybersecurity Hacking</td>
<td>3</td>
</tr>
<tr>
<td>CIS 295</td>
<td>VMware Certified Professional</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required Including Core Classes: 38-40

Certificate of Achievement

Students who complete the major including an area of emphasis qualify for a Certificate in Networking, Security and System Administration - Enterprise System Administration. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

II. WEB DEVELOPMENT

This degree program equips students with the essential coding, programming, and design skills needed to build websites and applications for desktop and mobile platforms. Students gain practical experience using state of the art web development technology to prepare for entry-level positions as web developers. The curriculum is continually updated to respond to rapidly changing industry trends.

Program Learning Outcomes

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

- Develop attractive, usable, mobile-friendly websites using current development technologies such as HTML/CSS, JavaScript, PHP/MySQL, frameworks, and content management systems.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 201</td>
<td>Cisco Networking Academy I</td>
<td>3</td>
</tr>
<tr>
<td>CIS 202</td>
<td>Cisco Networking Academy II</td>
<td>3</td>
</tr>
<tr>
<td>CIS 203</td>
<td>Cisco Networking Academy III</td>
<td>3</td>
</tr>
<tr>
<td>CIS 204</td>
<td>Cisco Networking Academy IV</td>
<td>3</td>
</tr>
<tr>
<td>CIS 205</td>
<td>Cisco Networking Academy IX</td>
<td>3</td>
</tr>
</tbody>
</table>

B. NETWORKING, SECURITY AND SYSTEM ADMINISTRATION - ENTERPRISE SYSTEM ADMINISTRATION

Program Learning Outcomes

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

- Install, configure, upgrade, test, and troubleshoot a personal computer (hardware, system software, and networking hardware and software) and Linux and Windows servers (directory services, networking, print services, server security, remote access, DNS, DHCP, web server, file server, mail server, FTP server, file systems, partitions, logical volumes, server/network performance, and data backup and recovery).

Associate in Science Degree Requirements: Core Curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 120</td>
<td>Computer Maintenance and A+ Certification</td>
<td>3</td>
</tr>
<tr>
<td>CIS 121</td>
<td>Network Cabling Systems</td>
<td>3</td>
</tr>
<tr>
<td>CIS 125</td>
<td>Network+ Certification</td>
<td>3</td>
</tr>
<tr>
<td>CIS 119</td>
<td>Program Design and Development</td>
<td>3</td>
</tr>
<tr>
<td>CIS 119L</td>
<td>Program Design and Development Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

Area of Emphasis:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 190</td>
<td>Windows Operating System</td>
<td>3</td>
</tr>
<tr>
<td>CIS 191</td>
<td>Linux Operating System</td>
<td>3</td>
</tr>
<tr>
<td>CIS 290</td>
<td>Windows Server-Installing and Configuring</td>
<td>2</td>
</tr>
<tr>
<td>CIS 291</td>
<td>Linux System Administration</td>
<td>3</td>
</tr>
<tr>
<td>CIS 293</td>
<td>Windows Server-Administering</td>
<td>2</td>
</tr>
<tr>
<td>CIS 294</td>
<td>Windows Server-Advanced Configuration</td>
<td>2</td>
</tr>
</tbody>
</table>

Select four of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 140</td>
<td>Databases</td>
<td>3</td>
</tr>
<tr>
<td>CIS 162</td>
<td>Technical Diagramming Using Microsoft Visio</td>
<td>2</td>
</tr>
<tr>
<td>CIS 261</td>
<td>NSSA Degree Capstone</td>
<td>2</td>
</tr>
<tr>
<td>CIS 263</td>
<td>Fundamentals of Network Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 264</td>
<td>Ethical Cybersecurity Hacking</td>
<td>3</td>
</tr>
<tr>
<td>CIS 265</td>
<td>Computer Forensics</td>
<td>3</td>
</tr>
<tr>
<td>CIS 295</td>
<td>VMware Certified Professional</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required Including Core Classes: 38-40

Plus General Education Requirements

Certificate of Achievement

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

CERTIFICATES OF SPECIALIZATION:

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

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

I. CISCO CERTIFIED NETWORK ASSOCIATE

Program Learning Outcomes

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

- Plan, design, configure, test, and troubleshoot network topologies consisting of routers, switches, wireless routers, and PCs using the Cisco IOS CLI; ip addressing; interior gateway protocols, HDLC, PPP and Frame-Relay WAN protocols; VLANs; NAT; DHCP; router and switch security techniques.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 201</td>
<td>Cisco Networking Academy I</td>
<td>3</td>
</tr>
<tr>
<td>CIS 202</td>
<td>Cisco Networking Academy II</td>
<td>3</td>
</tr>
<tr>
<td>CIS 203</td>
<td>Cisco Networking Academy III</td>
<td>3</td>
</tr>
<tr>
<td>CIS 204</td>
<td>Cisco Networking Academy IV</td>
<td>3</td>
</tr>
<tr>
<td>CIS 205</td>
<td>Cisco Networking Academy IX</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required: 15
II. CISCO NETWORK PROFESSIONAL
Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:

- Configure, diagnose, and troubleshoot complex enterprise router and switch networking solutions including: network performance; advanced routing protocols; VLANs; IPv4; advanced VLAN topologies; high availability and redundancy protocols; and LAN security.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 205</td>
<td>Implementing Cisco IP Routing</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(Route)</td>
<td></td>
</tr>
<tr>
<td>CIS 206</td>
<td>Cisco Networking Academy VI</td>
<td>3</td>
</tr>
<tr>
<td>CIS 207</td>
<td>Cisco Networking Academy VII</td>
<td>3</td>
</tr>
<tr>
<td>CIS 208</td>
<td>Cisco Networking Academy VIII</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Required</td>
<td>12</td>
</tr>
</tbody>
</table>

III. COMPUTER PROGRAMMING
Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:

- Be proficient in at least one high-level programming language and an ability to use that language to implement software solutions in a variety of settings following the systems development life cycle (SDLC).

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 119</td>
<td>Program Design and Development</td>
<td>3</td>
</tr>
<tr>
<td>CS 119L</td>
<td>Program Design and Development Lab</td>
<td>1</td>
</tr>
<tr>
<td>CS 181</td>
<td>Introduction to C++ Programming</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 182</td>
<td>Introduction to Java Programming</td>
<td>4</td>
</tr>
<tr>
<td>CS 281</td>
<td>Intermediate C++ Programming and</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Fundamental Data Structures</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 282</td>
<td>Intermediate Java Programming and</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Fundamental Data Structures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Required</td>
<td>12</td>
</tr>
</tbody>
</table>

IV. COMPUTER SUPPORT TECHNICIAN
Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:

- Describe and demonstrate the ability to install, configure, upgrade, diagnose and troubleshoot a personal computer and its associated networking hardware and system software.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 120</td>
<td>Computer Maintenance and A+ Certification</td>
<td>3</td>
</tr>
<tr>
<td>CIS 121</td>
<td>Network Cabling Systems</td>
<td>3</td>
</tr>
<tr>
<td>CIS 125</td>
<td>Network+ Certification</td>
<td>3</td>
</tr>
<tr>
<td>CIS 190</td>
<td>Windows Operating System</td>
<td>3</td>
</tr>
<tr>
<td>CIS 191</td>
<td>Linux Operating System</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Required</td>
<td>15</td>
</tr>
</tbody>
</table>

V. CYBER SECURITY SPECIALIST
Program Learning Outcomes
Upon completion of this certificate, students will be able to:

- Perform system scan and reconnaissance to determine vulnerabilities, then create a report showing vulnerabilities and recommendations for rectifying the cited weaknesses.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 125</td>
<td>Network+ Certification</td>
<td>3</td>
</tr>
<tr>
<td>CIS 190</td>
<td>Windows Operating System</td>
<td>3</td>
</tr>
<tr>
<td>CIS 191</td>
<td>Linux Operating System</td>
<td>3</td>
</tr>
<tr>
<td>CIS 209</td>
<td>Cisco Networking Academy IX</td>
<td>3</td>
</tr>
<tr>
<td>CIS 263</td>
<td>Fundamentals of Network Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 264</td>
<td>Ethical Cybersecurity Hacking</td>
<td>3</td>
</tr>
<tr>
<td>CIS 265</td>
<td>Computer Forensics Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Required</td>
<td>15</td>
</tr>
</tbody>
</table>

VI. WEB DESIGN
Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:

- Develop attractive, usable, mobile-friendly websites using current development technologies such as HTML/CSS, JavaScript, frameworks, and content management systems.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 211</td>
<td>Web Development I</td>
<td>3</td>
</tr>
<tr>
<td>CIS 213</td>
<td>Web Development II</td>
<td>3</td>
</tr>
<tr>
<td>CIS 225</td>
<td>Web Development Capstone</td>
<td>3</td>
</tr>
<tr>
<td>GD 126</td>
<td>Adobe Photoshop Digital Imaging</td>
<td>3</td>
</tr>
<tr>
<td>GD 217</td>
<td>Web Graphics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Required</td>
<td>15</td>
</tr>
</tbody>
</table>

VI. WEB PROGRAMMING
Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:

- Develop attractive, usable, mobile-friendly websites using current development technologies such as HTML/CSS, JavaScript, PHP/MySQL, frameworks, and content management systems.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 211</td>
<td>Web Development I</td>
<td>3</td>
</tr>
<tr>
<td>CIS 213</td>
<td>Web Development II</td>
<td>3</td>
</tr>
<tr>
<td>CIS 215</td>
<td>JavaScript Web Programming</td>
<td>3</td>
</tr>
<tr>
<td>CIS 219</td>
<td>PHP/MySQL Dynamic Web-Based Applications</td>
<td>3</td>
</tr>
<tr>
<td>CS 119</td>
<td>Program Design and Development</td>
<td>3</td>
</tr>
<tr>
<td>CS 119L</td>
<td>Program Design and Development Lab</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total Required</td>
<td>16</td>
</tr>
</tbody>
</table>

The following is required for the AA-T in Economics for Transfer degree:
1. 60 semester or 90 quarter CSU-transferable units;
2. The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education-Breadth Requirements;
3. Minimum of 16 semester or 27 quarter units in the major or area of emphasis;
4. Minimum grade point average (GPA) of 2.0;
5. Grade of C or better in all courses required for the major or area of emphasis.

Program Learning Outcomes
Upon completion of this program, students will be able to:

- Use microeconomic and macroeconomic models to explain demand, supply, and changes in output, employment, inflation and growth;
- Understand and apply core economic concepts such as opportunity cost, the role of the market, present value; exchange rates; marginal utility; the importance of incentives, and the connections between economic interests of individuals and society.

Associate in Arts for Transfer Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 120</td>
<td>Financial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>BUS 121</td>
<td>Managerial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>BUS 128</td>
<td>Business Communication</td>
<td>3</td>
</tr>
<tr>
<td>CIS 110</td>
<td>Principles of Information Systems</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>List B:</strong> (Select 1-2 courses; 3-4 units)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any List A course not used</td>
<td>9-4</td>
</tr>
<tr>
<td></td>
<td>Total Required</td>
<td>21-23</td>
</tr>
<tr>
<td></td>
<td>Double-Counted Units</td>
<td>9-12</td>
</tr>
<tr>
<td></td>
<td>General Education Requirements 37-39</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>7-12</td>
</tr>
<tr>
<td></td>
<td>Total Degree Units</td>
<td>60</td>
</tr>
</tbody>
</table>

The Associate in Arts for Elementary Teacher Education for Transfer (AA-T) Program is designed to provide lower division preparation for Liberal Arts, Liberal Studies, Integrated Teacher Education, or a similar major at a baccalaureate institution. It is an interdisciplinary program that provides students with a foundation of knowledge in the areas of English composition, oral communication, physical and life sciences, social sciences, arts and humanities, and critical thinking. Transfer students earning the Associate in Arts for Elementary Teacher Education for Transfer (AA-T) program will come to understand the behavior and interactions of economic agents and how economies work. This major prepares student to transfer to a California State University, where a baccalaureate degree may be earned in Economics or a closely related field.
the AA-T in Elementary Teacher Education will receive a broad, general education focus that will prepare them to teach a variety of subjects at the elementary school level. The following is required for the AA-T in Elementary Teacher Education 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.

Program Learning Outcomes

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

- Demonstrate interpersonal skills in a diverse setting.
- Demonstrate effective communication in teaching and learning environments.
- Use arithmetical, algebraic, geometric and statistical methods to solve problems.
- Describe general principles of the political institutions and government of the United States.
- Assess how social issues are influenced by geographical and historical processes.
- Analyze basic concepts of physical and biological science to evaluate scientific information and solve scientific problems.
- Analyze the principle elements of representative examples of art, architecture, literature, theater, philosophy, music, dance, film, or other relevant areas of cultural and/or intellectual creative.
- Demonstrate an awareness of the historical and philosophical context of representative areas, movements, media, works, or styles of cultural and/or intellectual creativity.
- Demonstrate the ability to write effectively.
- Organize thoughts and ideas in both oral and written format.

Associate in Arts Degree Requirements:

Core Curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 130</td>
<td>General Biology I</td>
<td>3</td>
</tr>
<tr>
<td>BIO 131</td>
<td>General Biology I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CD 125</td>
<td>Child Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>Fundamentals of Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>COMM 122</td>
<td>Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ED 200</td>
<td>Teaching as a Profession</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 120</td>
<td>College Composition and Reading</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 122</td>
<td>Introduction to Literature</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 106</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 121</td>
<td>Physical Geography; Earth Systems Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 104</td>
<td>Earth Science</td>
<td>3</td>
</tr>
<tr>
<td>HIST 100</td>
<td>Early World History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 108</td>
<td>Early American History</td>
<td>3</td>
</tr>
<tr>
<td>MATH 125</td>
<td>Structure and Concepts of Elementary Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 110</td>
<td>Introductory Physics</td>
<td>4</td>
</tr>
<tr>
<td>POSC 121</td>
<td>Introduction to U.S. Government and Politics</td>
<td>3</td>
</tr>
</tbody>
</table>

- **List A:**
  - ENGL 124  Advanced Composition: Critical Reasoning and Writing 3

- **List B:**
  - **Select one:**
    - ART 100  Art Appreciation 3
    - MUS 110  Great Music Listening 3
    - THTR 110  Introduction to the Theatre 3

- **List C:**
  - **Select eight units:**
    - Any course in List B not selected 3
    - ARBC 121  Arabic II 5
    - 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
    - ASL 121  American Sign Language II 4
    - COMM 120  Interpersonal Communication 3
    - ES 253  Physical Education in Elementary Schools 3
    - FREN 121  French II 5
    - HED 105  Health Education for Teachers 1
    - ITAL 121  Italian II 5
    - MATH 126  Structure and Concepts of Elementary Mathematics II 3
    - MATH 128  Children's Mathematical Thinking 1.5
    - MUS 118  Introduction to Music 4
    - PHIL 125  Critical Thinking 3
    - PHIL 130  Logic 3
    - PHIL 140  Problems in Ethics 3
    - RELG 120  World Religions 3
    - RELG 130  Scriptures of World Religions 3
    - SPAN 121  Spanish II 5

Total Units for Major 60
Total Units for CSU GE or IGETC-CSU General Education Requirements (all met) 37-39
Total Transferable Elective Units 0
Total Units for Degree 60

Please note: SDSU accepts this degree for students transferring into Liberal Studies Generalist Education.

II. ELEMENTARY EDUCATION

This degree program is designed to provide lower division preparation for transfer to San Diego State University as a Liberal Studies major. Because the degree emphasizes a strong general education approach, it may be an appropriate major for a variety of career options. Students are encouraged to refer to the San Diego State University catalog and/or consult with an academic advisor before selecting the various options listed below. Upon completion, students may request certification of lower division general education course work required by the California State University system. Students interested in transferring to another college or university should check the requirements of that institution.

Program Learning Outcomes

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

- Demonstrate global awareness and cultural sensitivity.
- Demonstrate interpersonal skills in a diverse setting.
- Demonstrate effective communication in teaching and learning environments.
- Demonstrate technological awareness.
- Be prepared to request certification of lower division general education course work required by the California State University system.
Program Learning Outcomes
Upon successful completion of this program, students will be able to:

• Visualize 3D objects and sketch them accurately in 2D.
• Solve engineering problems through computer modeling, employing a computer language such as C or Java.
• Design and write computer programs that employ linked list memory management, stacks, tree data structures, and searching and sorting algorithms.
• Determine the DC and steady-state AC voltages and currents everywhere in an electric circuit composed of passive components.
• Model linear systems of arbitrary size and complexity using linear algebra.
• Model transient and steady-state electrical systems using systems of 2nd order differential equations.
• Apply Green’s theorem, Stokes’ theorem, and Maxwell’s equations to solve simple problems in electrostatics and electromagnetism.
• Analyze and design combinational and sequential digital logic systems of arbitrary complexity, including (for example) Moore and Mealy sequential machines.

Associate in Science Degree Requirements:

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

• Visualize 3D objects and draw them in 2D, both by sketching and through the use of computer-aided drafting software, produce a complete set of drawings sufficient to manufacture a part, including dimensions and tolerances.
• Solve engineering problems through computer modeling, employing an engineering computer language such as Matlab.
• Design a rigid structure such as a bridge, determining forces in each part of the structure. Determine the weight and location of the center of gravity of the structure.
• Design a dynamic system such as a piston or linkage, and compute forces, accelerations, and speeds of all components of the system.
• Apply the tools of surveying, including total station instruments, to analyze the topography of land, construction staking, and setting property boundaries.
• Model vibrating systems using systems of 2nd order differential equations.
• Analyze experimental data to determine summary statistics (e.g., mean, variance), apply appropriate statistical tests to data sets, and design statistical experiments.

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 141</td>
<td>General Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>CS 181</td>
<td>Introduction to C++ Programming</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 182</td>
<td>Introduction to Java Programming</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 281</td>
<td>Intermediate C++ Programming</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 282</td>
<td>Intermediate Java Programming and Fundamental Data Structures</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Required: 54

Plus General Education Requirements

III. MECHANICAL AND AEROSPACE ENGINEERING

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

• Visualize 3D objects and draw them in 2D, both by sketching and through the use of computer-aided drafting software, produce a complete set of drawings sufficient to manufacture a part, including dimensions and tolerances.
• Solve engineering problems through computer modeling, employing an engineering computer language such as Matlab.
• Design a rigid structure such as a bridge, determining forces in each part of the structure. Determine the weight and location of the structure’s center of gravity.
• Design a dynamic system such as a piston or linkage and compute forces, accelerations, and speeds of all components of the system.
• Select an appropriate material for manufacturing a part or product and determine the appropriate material processing techniques to produce the part. Justify the choice of material on the basis of
ENGLISH

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 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

List A: Select one of the following:

ENGL 221 | British Literature I | 3
ENGL 222 | British Literature II | 3
ENGL 251 | American Literature I | 3
ENGL 252 | American Literature II | 3
ENGL 270 | World Literature I | 3
ENGL 271 | World Literature II | 3

List B: Select one of the following:

ENGL 126 | Creative Writing | 3
ENGL 202 | Introduction to Film as Literature | 3
ENGL 217 | Fantasy and Science Fiction | 3

Any course from List A not selected above | 3

Total Units for Major (6 units may double counted with GE) | 18-20
Total Units for CSU GE Breadth or IGETC-CSU | 37-39
Total Transferable Elective Units | 10-17
Total Units for Degree | 60

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

II. ENGLISH

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

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

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 own writing to support their explicit theses while avoiding plagiarism and adhering to scholarly standards for citation of information.

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

Associate in Arts Degree Requirements:
Course Title Units
ENGL 120 College Composition and Reading 3
ENGL 122 Introduction to Literature 3
ENGL 124 Advanced Composition: Critical Reasoning and Writing 3
ENGL 126 Creative Writing 3
ENGL 270 World Literature I 3
ENGL 271 World Literature II 3

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 275 Literary Period 3
ENGL 276 Major Author 3
ENGL 277 Literary Theme 3

Select one of the following:
ENGL 201 Images of Women in Literature 3
ENGL 202 Introduction to Film as Literature 3
ENGL 207 Romance Fiction 3
ENGL 214 Masterpieces of Drama 3
ENGL 217 Fantasy and Science Fiction 3

Select one of the following:
ANTH 120 Cultural Anthropology 3
HIST 100 Early World History 3
HIST 101 Modern World History 3
HIST 105 Early Western Civilization 3
HIST 106 Modern Western Civilization 3
HUM 100 European Humanities 3
HUM 140 Humanities of the Americas 3
HUM 155 World Mythology Through the Humanities 3
PHIL 115 History of Philosophy I: Ancient 3
PHIL 117 History of Philosophy II: Modern and Contemporary 3
RELG 170 Introduction to the New Testament 3

Total Required 30
Plus General Education Requirements

Recommended Electives: Students planning to transfer to four-year institutions to complete a bachelor’s degree in English are STRONGLY urged to take the following courses, depending on the requirements at those schools: Two sequential semesters of a single foreign language (10 units).

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.

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 cultural, social and technological issues.
• Identify and analyze business problems or entrepreneurial opportunities and effectively communicate recommendations for courses of action.
• 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
or
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

Select two of the following:
BUS 156 Principles of Management 3
BUS 176 Computerized Accounting Applications 2

Select at least three units from the following:
BOT 100 Basic Keyboarding 1
BOT 101AB Keyboarding/Document Processing I-II 3
BOT 102AB Intermediate Keyboarding/Document Processing I-II 3
BOT 114 Essential Word 1
BOT 115 Essential Excel 1
BOT 116 Essential Access 1
BOT 117 Essential PowerPoint 1
CIS 105 Introduction to Computing 2
CIS 110 Principles of Information Systems 4

Total Required 23-24
Plus General Education Requirements

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

ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT

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

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

I. ENVIRONMENTAL MANAGEMENT

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Identify and interpret Federal, State and local regulations related to Environmental Health and Safety Management.
• Understand and analyze historical environmental laws and regulations which impact hazardous material management and their effect on the environment.
• Identify and Interpret Federal, State and local regulations related to air pollution.
• Define and describe the components of the Hazard Communication Standards required “Hazardous Communication Plan.”
• Identify and describe components of Storm Water Pollution Prevention Plans in accordance with the Clean Water Act.
• Describe and define Regional Water Quality Control Board role in Clean Water Act over site and enforcement of National Pollution Discharge Elimination System (NPDES) permitting and inspections.
• Understand and analyze historical environmental laws and regulations which
impact hazardous material management and their effect on the environment.
  - Describe and apply terms common to the hazardous materials industry.
  - Describe agencies that regulate specific hazardous materials.

**Associate in Science Degree Requirements:**

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

**Total Required** 37-40

**Select one of the following:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 110</td>
<td>Principles of Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>COMM 122</td>
<td>Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 120</td>
<td>Spanish I</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Required** 3-5

**Plus General Education Requirements**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:
  - Identify and interpret Federal, State and local regulations related to air pollution.
  - Define and describe the components of the Hazard Communication Standards required “Hazardous Communication Plan.”
  - Identify and describe components of Storm Water Pollution Prevention Plans in accordance with the Clean Water Act.
  - Describe and define Regional Water Quality Control Board role in Clean Water Act over site and enforcement of National Pollution Discharge Elimination System (NPDES) permitting and inspections.
  - Understand and analyze historical environmental laws and regulations which impact hazardous material management and their effect on the environment.
  - Identify and interpret Federal, state and local regulations related to air pollution.
  - Define and describe the components of the Hazard Communication Standards required “Hazardous Communication Plan.”
  - Identify and describe components of Storm Water Pollution Prevention Plans in accordance with the Clean Water Act.
  - Describe and define Regional Water Quality Control Board role in Clean Water Act over site and enforcement of National Pollution Discharge Elimination System (NPDES) permitting and inspections.
  - Understand and analyze historical environmental laws and regulations which impact hazardous material management and their effect on the environment.
  - Describe and apply terms common to the hazardous materials industry.
  - Describe agencies that regulate specific hazardous materials.

**Certificate Requirements:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHSM 100</td>
<td>Introduction to Environmental and Occupational Safety and Health (OSH) Technology</td>
<td>4</td>
</tr>
<tr>
<td>EHSM 110</td>
<td>Pollution Prevention</td>
<td>3</td>
</tr>
<tr>
<td>EHSM 150</td>
<td>Hazardous Waste Management Applications</td>
<td>4</td>
</tr>
<tr>
<td>EHSM 200</td>
<td>Hazardous Materials Management (HMM) Applications</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Required** 3-5

**Plus General Education Requirements**

**Certificate of Achievement**

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

**III. OCCUPATIONAL SAFETY AND HEALTH (OSH) TECHNICIAN**

**Program Learning Outcomes**

Upon successful completion of this program, students will be able to:
  - Identify and evaluated hazardous material routes of entry, toxic effect, risk evaluation and control measures to reduce their exposure and effects.
  - Describe and apply terms common to the hazardous materials industry.
  - Apply California and Federal safety standards to assess worksites and recognize hazardous conditions and/or noncompliance.
  - Assess and evaluate job processes to identify and implement appropriate risk management strategies.
  - Identify key mandatory components of an Injury Illness Prevention Plan (IIPP) in compliance with SB198.

**Certificate Requirements:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHSM 100</td>
<td>Introduction to Environmental and Occupational Safety and Health (OSH) Technology</td>
<td>4</td>
</tr>
<tr>
<td>EHSM 130</td>
<td>Environmental/Occupational Health Effects of Hazardous Materials</td>
<td>3</td>
</tr>
<tr>
<td>EHSM 135</td>
<td>General Industry Safety Standards</td>
<td>3</td>
</tr>
<tr>
<td>EHSM 145</td>
<td>Construction Safety Standards</td>
<td>3</td>
</tr>
<tr>
<td>EHSM 200</td>
<td>Hazardous Materials Management (HMM) Applications</td>
<td>4</td>
</tr>
<tr>
<td>EHSM 201</td>
<td>Introduction to Industrial Hygiene and Occupational Health</td>
<td>4</td>
</tr>
<tr>
<td>EHSM 205</td>
<td>Safety and Risk Management Administration</td>
<td>4</td>
</tr>
<tr>
<td>EHSM 230</td>
<td>Hazwoper Certification</td>
<td>3</td>
</tr>
<tr>
<td>EHSM 240</td>
<td>Cooperative Work Experience</td>
<td>1-4</td>
</tr>
</tbody>
</table>

**Select two of the following:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHSM 145</td>
<td>Construction Safety Standards</td>
<td>3</td>
</tr>
<tr>
<td>EHSM 205</td>
<td>Safety and Risk Management Administration</td>
<td>4</td>
</tr>
<tr>
<td>EHSM 230</td>
<td>Hazwoper Certification</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Required** 19-22

**Certificate of Achievement**

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

**GENERAL STUDIES**

The Associate Degree in General Studies with an Area of Emphasis provides an opportunity for students to design a program of study meaningful and appropriate to their own needs and academic interests. The degree includes general education and a focused area of study. Students may choose to earn this degree for preparation for employment or for personal development.

**Requirements**

To meet the General Studies degree requirements, a student must complete the following:

**I. AS or AA General Education Requirements (see Degree Requirements and Transfer Information section)**
Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Contribute to an effective and ethical organization.
• Use information technology to support effective decision making in the business organization.
• Analyze markets, economic environments and associated trends at the macro and micro level.
• Express and apply quantitative information in order to make sound decisions and solve problems in the business environment.

Business
BUS 109, 110, 111, 115, 120, 121, 122, 124, 125, 128, 129, 150, 155, 156, 161, 162, 176, 195, 240, 242

Computer and Information Science
CIS 105, 110, 120, 121, 125, 140, 162, 190, 191, 201, 202, 203, 204, 205, 211, 213, 215, 219, 240, 242, 261, 262, 263, 290, 291

Economics
ECON 110, 120, 121

Mathematics
MATH 160, 178, 180

B. Communication and Language Arts
The Associate in Arts in General Studies with an Emphasis in Communication and Language Arts will be awarded to students upon completion of general education degree requirements and 18 units in this area. These courses emphasize 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 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.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Demonstrate the ability to write effectively.
• Demonstrate the ability to locate relevant, reliable information and read it effectively.
• Organize thoughts and ideas in both oral and written format.
• Communicate effectively with diverse audiences.

Communication
BUS 128
COMM 110, 120, 122, 123, 124, 130, 135, 136, 137, 145

Language Arts
ARAM 120, 121, 220, 221
ARBC 120, 121, 122, 123, 230, 221, 250, 251, 254
ASL 120, 121, 220, 221
BUS 128
CHIN 120, 121, 220, 221, 250, 251
ENGL 122, 124, 126, 201, 202, 207, 214, 217, 221, 222, 231, 232, 270, 271, 275, 276, 277
FREN 120, 121, 220, 251
ITAL 120, 121, 220
LIR 110
NAKY 120, 121, 220
SPAN 120, 121, 220, 250, 251

C. Humanities and Fine Arts
The Associate in Arts in General Studies with an Emphasis in Humanities and Fine Arts will be awarded to students upon completion of general education degree requirements and 18 units in this area. These courses emphasize the study of cultural, humanistic activities and artistic expression of human beings. Students will evaluate and interpret the ways in which people 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 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.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Develop an understanding of optimal health and fitness in daily life through informed decision-making.
• Describe basic principles of nutrition.
• Value the importance of physical activity through the lifespan.

Health
BIO 115
HED 105, 120, 201, 202, 203, 204, 251

Exercise Science

Nutrition
HED 155, 158, 255

Self-Development
COUN 110, 120, 130, 140, 150

E. Science and Mathematics
The Associate in Science in General Studies with an Emphasis in Science and Mathematics will be awarded to students upon completion of general education degree requirements and 18 units in this area. These courses emphasize the study of mathematical and quantitative reasoning skills and apply the facts and principles that form the foundations of living and non-living systems. Students will recognize and utilize the methodologies of science as investigative tools, as well as the limitations of science. Students will use mathematical skills to solve numerical problems encountered in daily life, and more advanced skills for applications in the physical and life sciences. Students must complete a minimum of six units in Science and six units in Mathematics (limitation of one statistics course). The remaining six units may be taken from any category.
Program Learning Outcomes
Upon successful completion of this program, students will be able to:
- Use algebraic methods to solve problems.
- Interpret basic mathematical models and draw inferences from them.
- Represent mathematical information symbolically, visually, numerically and verbally.
- Use the scientific method of inquiry and techniques to answer questions about physical and biological processes.
- Analyze basic concepts of physical and biological science to evaluate scientific information and solve scientific problems.

Science
ANTH 130
ASTR 110, 112
BIO 112, 115, 122, 124, 130, 131, 133, 134, 135, 140, 141, 141L, 152, 230, 240, 251
CHEM 102, 105, 113, 115, 116, 120, 141, 142, 230, 231, 232, 240, 251
ET 110
GEOG 120, 121
GEOL 100, 110, 111
OCEA 112, 113
PHYS 110, 130, 131, 190, 200, 210

Mathematics
BIO 215
MATH 160, 170, 175, 176, 180, 245, 280, 281, 284, 285

CADD and Engineering
CADD 115, 125, 129, 131
ENGR 100, 119, 120, 125, 129, 131, 175, 176, 218, 270

Computer Science
CS 119, 119L, 181, 182, 281, 282

F. Social and Behavioral Sciences
The Associate in Arts in General Studies with an Emphasis in Social and Behavioral Sciences will be awarded to students upon completion of general education degree requirements and 18 units in this area. These courses emphasize the study and understanding of human behavior. Students will evaluate and interpret human societies; the institutions, organizations and groups that form them; the ways in which individuals and groups relate to one another; and various approaches and methodologies of the disciplines. 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.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
- Describe general principles of the political institutions and government of the United States.
- Demonstrate an understanding and appreciation of social, political, and economic institutions within a historical perspective.
- Evaluate the ways people act and interact in cultures, societies and social subgroups.
- Assess how social issues are influenced by geographical and historical processes.
- Apply knowledge of social and behavioral sciences theories and scientific methods in an assessment of real-world problems.

Social Science
ANTH 120, 140
ARBC 145
BIO 134
CD 145
ECON 110, 120, 121
EGEOG 106, 122, 130
HIST 100, 101, 105, 106, 108, 109, 118, 119,

122, 123, 124, 130, 131, 132, 180, 181, 275, 276, 277
POSC 120, 121, 124, 130, 140
SOC 120, 125, 130
SPAN 145

Behavioral Science
CD 115, 125, 131
COMM 110, 124
HED 120, 156, 201, 203, 204, 251
PSY 120, 125, 134, 138, 140, 150, 170, 201, 220

GRAPHIC DESIGN
Students in this degree program develop entry level skills in design aesthetics, typography, illustration, digital imaging, page layout, web design and professional business practices. The course work provides training with state of the art computer hardware and software used in the graphic design profession. Students develop a professional portfolio for job interviews. Designed for a two-year degree or certificate only. Students interested in pursuing a bachelor’s degree should refer to the Art–Graphic Design degree; please consult the catalog of the transfer institution for specific requirements.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
- Clarify design objectives and then apply design principles, communication skills, and production techniques to develop effective designs using industry standard software.

CAREER OPPORTUNITIES
- Advertising Director
- Art Director
- Cartoonist
- Desktop Publisher
- Display Designer
- Graphic Designer
- Illustrator
- Marketing Director
- Multimedia Designer
- Package Designer
- Technical Illustrator
- Web Designer
- Bachelor Degree or higher required

Course Equivalencies:
The following Cuyamaca and Grossmont College courses are considered similar enough to be treated as equivalent. Modification of Major forms are not required.

Cuyamaca
Course
ART 124 Drawing I
ART 211 Printmaking
GD 105 Digital Imaging

Grossmont
Course
Similar
ART 171

Associate in Science Degree Requirements:
- Course
  - ART 124 Drawing I 3
  - CIS 211 Web Development 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 I 3
  - GD 129 Page Layout 3
  - GD 130 Professional Business Practices 3
  - GD 225 Digital Illustration 3

Select three of the following:
- ART 230 Figure Drawing I 3
- GD 210 Professional Digital Photography I 3
- GD 211 Professional Digital Photography II 3
- GD 212 Professional Digital Photography III 3
- GD 217 Web Graphics 3
- GD 222 Web Animation 3
- GD 223 Advanced Web Animation 3
- GD 230 Graphic Design Work Experience 1-4
- Total Required 7-10
- Plus General Education Requirements

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

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

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

I. DIGITAL PHOTOGRAPHY
Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:
- Clarify design objectives and then apply design principles and production techniques to develop effective photographic images using industry standard equipment and software.

Certificate Requirements:
- Course
  - GD 126 Adobe Photoshop Digital Imaging 3
  - GD 130 Professional Business Practices 3
  - GD 210 Professional Digital Photography I 3
  - GD 211 Professional Digital Photography II 3
  - GD 212 Professional Digital Photography III 3
- Total Required 15

II. WEB GRAPHICS
Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:
- Clarify design objectives and then apply design principles, communication skills, and production techniques to develop effective web designs using industry standard software.

Certificate Requirements:
- Course
  - CIS 211 Web Development I 3
  - GD 110 Graphic Design Principles 3
  - GD 210 Professional Digital Photography I 3
  - GD 217 Web Graphics 3
  - GD 222 Web Animation 3
- Total Required 15

Additional Information:
- Certificate Equivalencies:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
- Program Learning Outcomes:
- General Education Requirements:
- Course Equivalencies:
I. HISTORY FOR TRANSFER (AA-T)

This degree program is useful for students preparing for careers in teaching, the law, government service, and research. Completion of the degree represents fulfillment of the department mission to instill an understanding of and reverence for the past so students better appreciate their own place in the global society. Through a wide range of course offerings, the department establishes a detailed knowledge of the variety of human experiences across time. The department emphasizes reading, writing, oral presentation, primary source analysis, and research techniques to build critical thinking and life-long learning skills that benefit students in their collegiate, professional, and personal lives.

The following is required for the AA-T in History 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:
- Recognize theories of historical interpretation.
- Describe historical and philosophical underpinnings of government systems and ideologies.
- Demonstrate how literature and the arts help us understand the past.
- Define historical periods and transitions.
- Distinguish between primary and secondary sources.

Associate in Arts Degree Requirements

Core Curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 108</td>
<td>Early American History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 109</td>
<td>Modern American History</td>
<td>3</td>
</tr>
</tbody>
</table>

List A: Select six units:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 100</td>
<td>Early World History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 105</td>
<td>Early Western Civilization</td>
<td>3</td>
</tr>
<tr>
<td>HIST 101</td>
<td>Modern World History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 106</td>
<td>Modern Western Civilization</td>
<td>3</td>
</tr>
</tbody>
</table>

List B: Select one course from each group:

Group 1: Select one of the following diversity courses:
- ARBC 145
- HIST 118, 119, 130, 131, 132, 133, 180, 181, or HIST 100 or 101 if not selected above
- MUS 116
- RELG 120, 130
- SPAN 141, 145
- Or a world language course that fulfills CSU GE Area C2

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 101</td>
<td>Modern World History</td>
<td>6</td>
</tr>
<tr>
<td>HIST 105</td>
<td>Early Western Civilization</td>
<td>3</td>
</tr>
<tr>
<td>HIST 106</td>
<td>Modern Western Civilization</td>
<td>6</td>
</tr>
<tr>
<td>HIST 108</td>
<td>Early American History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 109</td>
<td>Modern American History</td>
<td>6</td>
</tr>
</tbody>
</table>

Group 2: Select one course related to history:
- ANTH 120
- ART 100, 140, 141, 143, 144, 145
- ENGL 122, 201, 202, 207, 214, 221, 222, 231, 232
- HIST 122, 123, 124, or any history course not selected above
- HUM 110, 120, 140, 155
- MUS 110, 111, 114, 115, 117
- PHIL 160, 170
- POSC 120, 121, 124, 130, 140
- RELG 160, 170
- THTR 110

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 101</td>
<td>Early World History</td>
<td>6</td>
</tr>
<tr>
<td>HIST 105</td>
<td>Early Western Civilization</td>
<td>3</td>
</tr>
<tr>
<td>HIST 106</td>
<td>Modern Western Civilization</td>
<td>6</td>
</tr>
<tr>
<td>HIST 108</td>
<td>Early American History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 109</td>
<td>Modern American History</td>
<td>6</td>
</tr>
</tbody>
</table>

Total Units for Major: 18 units may be double-counted with GE.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 101</td>
<td>Early World History</td>
<td>6</td>
</tr>
<tr>
<td>HIST 105</td>
<td>Early Western Civilization</td>
<td>3</td>
</tr>
<tr>
<td>HIST 106</td>
<td>Modern Western Civilization</td>
<td>6</td>
</tr>
<tr>
<td>HIST 108</td>
<td>Early American History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 109</td>
<td>Modern American History</td>
<td>6</td>
</tr>
</tbody>
</table>

Total Required: 18 units

Program Learning Outcomes

Upon successful completion of this program, students will be able to:
- Recognize theories of historical interpretation.
- Describe historical and philosophical underpinnings of government systems and ideologies.
- Demonstrate how literature and the arts help us understand the past.
- Define historical periods and transitions.
- Distinguish between primary and secondary sources.

CAREER OPPORTUNITIES

- Anthropologist
- Archaeologist
- Attorney
- Cartographer
- College History Professor
- Historian
- Intelligence Analyst
- Journalist
- Legislative Assistant
- Politician
- Research Historian
- Secondary School Teacher
- Travel Advisor
- Technical Writer
- Textbook Writer/Editor
- Bachelor Degree or higher required

Associate in Arts Degree Requirements:

Select twelve units from any two of the following sequences:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 100</td>
<td>Early World History</td>
<td>6</td>
</tr>
<tr>
<td>HIST 101</td>
<td>Modern World History</td>
<td>6</td>
</tr>
<tr>
<td>HIST 105</td>
<td>Early Western Civilization</td>
<td>6</td>
</tr>
<tr>
<td>HIST 106</td>
<td>Modern Western Civilization</td>
<td>6</td>
</tr>
<tr>
<td>HIST 108</td>
<td>Early American History</td>
<td>6</td>
</tr>
<tr>
<td>HIST 109</td>
<td>Modern American History</td>
<td>6</td>
</tr>
</tbody>
</table>

Select six units from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 118</td>
<td>U.S. History: Chicano/Chicana Perspectives I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 119</td>
<td>U.S. History: Chicano/Chicana Perspectives II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 122</td>
<td>Women in Early American History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 123</td>
<td>Women in Modern American History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 124</td>
<td>History of California</td>
<td>3</td>
</tr>
<tr>
<td>HIST 180</td>
<td>U.S. History: Black Perspectives I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 181</td>
<td>U.S. History: Black Perspectives II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 210</td>
<td>Women in Western Civilization</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required: 18 units

CAREER OPPORTUNITIES

- Anthropologist
- Archaeologist
- Attorney
- Cartographer
- College History Professor
- Historian
- Intelligence Analyst
- Journalist
- Legislative Assistant
- Politician
- Research Historian
- Secondary School Teacher
- Travel Advisor
- Technical Writer
- Textbook Writer/Editor
- Bachelor Degree or higher required

INTERSEGMENTAL GENERAL EDUCATION TRANSFER CURRICULUM (CSU OR UC)

Certificate of Achievement

The Certificate of Achievement in Intersegmental General Education Transfer Curriculum (IGETC) may be awarded upon completion of the IGETC requirements (see Degree Requirements and Transfer Information section). Students must complete a minimum of 39 units, which are distributed among six areas. IGETC requirements are designed to be taken with a major area of concentration and elective courses in preparation for transfer to the California State University or the University of California.

Courses completed at California Community Colleges and participating institutions will be certified based on approval at the original campus. Courses taken at other colleges and universities; i.e. out-of-state, private, may be used in the certification under certain conditions. Although this certificate recognizes the completion of lower division general education requirements for IGETC, it does not guarantee admission to a four-year institution. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:
- Exhibit proficiency in written communication in English.
- Exhibit proficiency in oral communication in English (IGETC-CSU).
- Analyze, critique, and advocate ideas and reach well-supported conclusions.
- Show skills and understanding beyond the level of intermediate algebra, and apply mathematical concepts to solve problems.
• Analyze and appreciate works of philosophical, historical, literary, aesthetic and cultural importance.
• Reveal an historical understanding of major civilizations and cultures, both Western and non-Western.
• Recognize the contributions to knowledge, civilization, and society that have been made by various ethnic or cultural groups.
• Evaluate the basic concepts of physical and biological sciences.
• Use the scientific method of inquiry and techniques to answer questions about physical and biological processes.
• Demonstrate proficiency in a language other than English equal to two years of high school study (IGETC-UC).

## KINESIOLOGY

### Associate Degree for Transfer™

#### I. KINESIOLOGY FOR TRANSFER (AA-T)

The Associate in Arts in Kinesiology for Transfer degree is designed to prepare students for transfer to a California State University (CSU) by fulfilling lower-division requirements for the disciplines of Kinesiology, Exercise Science and Physical Education. This major provides preparation for careers in physical therapy, coaching, personal training, and other allied health professions by including classes oriented toward fitness, wellness, and health promotion throughout the lifespan.

The following is required for the AA-T in Kinesiology 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:

• 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.
• 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.

## Associate in Arts Degree Requirements:

### Core Curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 140</td>
<td>Human Anatomy</td>
<td>5</td>
</tr>
<tr>
<td>BIO 141</td>
<td>Human Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 141L</td>
<td>Laboratory in Human Physiology</td>
<td>1</td>
</tr>
<tr>
<td>ES 250</td>
<td>Introduction to Kinesiology</td>
<td>3</td>
</tr>
</tbody>
</table>

### Movement Based Courses:

Select one course from three different areas for a minimum of three units:

- Combatives:
  - ES 180 Self Defense for Women 1
  - ES 181BCD Karate I-IV 1.5

- Individual Sports:
  - ES 060ABC Beginning, Intermediate, Advanced Badminton 1
  - ES 076ABC Beginning, Intermediate, Advanced Tennis 1
  - ES 125A Beginning Golf 1
  - ES 125BC Intermediate, Advanced Golf 1.5

- Team Sports:
  - ES 155ABC Beginning, Intermediate, Advanced Basketball 1
  - ES 170ABC Beginning, Intermediate, Advanced Soccer 1
  - ES 171ABC Beginning, Intermediate, Advanced Softball 1
  - ES 175ABC Beginning, Intermediate, Advanced Volleyball 1.5

### List A: Select one Chemistry course:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 102</td>
<td>Introduction to General, Organic and Biological Chemistry 5</td>
</tr>
</tbody>
</table>

- or -

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 160</td>
<td>Elementary Statistics 4</td>
</tr>
</tbody>
</table>

### List B: Select one course from three different areas for a minimum of 15-16.5 units:

- or -

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 009ABC</td>
<td>Beginning, Intermediate, Advanced Aerobic Dance Exercise 1</td>
</tr>
<tr>
<td>ES 014ABC</td>
<td>Beginning, Intermediate, Advanced Body Building 1.5</td>
</tr>
<tr>
<td>ES 019ABC</td>
<td>Beginning, Intermediate, Advanced Physical Fitness 1.5</td>
</tr>
</tbody>
</table>

### IGETC (CSU OR UC) • KINESIOLOGY

#### 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.

### 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

### Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 130</td>
<td>General Biology I</td>
<td>3</td>
</tr>
<tr>
<td>BIO 131</td>
<td>General Biology II Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>BIO 140</td>
<td>Human Anatomy</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>Fundamentals of Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>COMM 122</td>
<td>Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ES 014ABC</td>
<td>Body Building</td>
<td>1.5</td>
</tr>
<tr>
<td>ES 250</td>
<td>Introduction to Kinesiology</td>
<td>3</td>
</tr>
<tr>
<td>ES 255</td>
<td>Care and Prevention of Athletic Injuries</td>
<td>3</td>
</tr>
<tr>
<td>HED 158</td>
<td>Nutrition for Fitness and Sports</td>
<td>3</td>
</tr>
<tr>
<td>HED 255*</td>
<td>Science of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>PSY 120</td>
<td>Introductory Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 120</td>
<td>Introductory Sociology</td>
<td>3</td>
</tr>
</tbody>
</table>

### Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 215</td>
<td>Personal Trainer</td>
<td>3</td>
</tr>
<tr>
<td>MATH 160</td>
<td>Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>PSY 215</td>
<td>Statistics for the Behavioral Sciences</td>
<td>4</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 001</td>
<td>Aerobic Dance Exercise</td>
<td>1</td>
</tr>
<tr>
<td>ES 009ABC</td>
<td>Beginning, Intermediate, Advanced Aerobic Dance Exercise</td>
<td>1</td>
</tr>
<tr>
<td>ES 019ABC</td>
<td>Physical Fitness</td>
<td>1.5</td>
</tr>
<tr>
<td>ES 060ABC</td>
<td>Beginning, Intermediate, Advanced Aerobic Dance Exercise</td>
<td>1</td>
</tr>
<tr>
<td>ES 076ABC</td>
<td>Beginning, Intermediate, Advanced Aerobic Dance Exercise</td>
<td>1</td>
</tr>
<tr>
<td>ES 125A</td>
<td>Beginning Golf</td>
<td>1</td>
</tr>
<tr>
<td>ES 125BC</td>
<td>Intermediate, Advanced Golf</td>
<td>1.5</td>
</tr>
<tr>
<td>ES 155ABC</td>
<td>Beginning, Intermediate, Advanced Golf</td>
<td>1</td>
</tr>
<tr>
<td>ES 170ABC</td>
<td>Beginning, Intermediate, Advanced Golf</td>
<td>1</td>
</tr>
<tr>
<td>ES 171ABC</td>
<td>Beginning, Intermediate, Advanced Golf</td>
<td>1</td>
</tr>
<tr>
<td>ES 175ABC</td>
<td>Beginning, Intermediate, Advanced Golf</td>
<td>1.5</td>
</tr>
<tr>
<td>ES 250</td>
<td>Introduction to Kinesiology</td>
<td>3</td>
</tr>
<tr>
<td>ES 255</td>
<td>Care and Prevention of Athletic Injuries</td>
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<tr>
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</tr>
<tr>
<td>PSY 120</td>
<td>Introductory Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 120</td>
<td>Introductory Sociology</td>
<td>3</td>
</tr>
</tbody>
</table>

- *Students planning to transfer to SDSU must take HED 255.*
CERTIFICATE OF SPECIALIZATION:

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

Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:
• Describe and or demonstrate an hour of cooperative activity for children.
• Describe how principles learned in class may be applied to improve cardiovascular endurance, muscle strength, muscle endurance, and flexibility and body composition, (the five basic components of fitness) in children using walking as a primary conditioning activity.
• Investigate and list causes and risk factor associated with childhood obesity.
• Describe and prepare appropriate snacks for children.
• Demonstrate appropriate classroom organizational and management techniques.
• Demonstrate the ability to plan school-based recreational programs which deliberately intend to advance, stimulate or otherwise enhance children’s physical, emotional and social development in ways which are appropriate to their developmental level.
• Describe tested and proven teaching approaches to analyze and enhance movement competencies.

Career Opportunities
Students may find positions in an elementary or middle school, YMCA, recreation center, day or residential camp, or after school day care program. This is a great “stepping-stone” training for those who want to major in exercise science, recreation, elementary education or child development. Provides students with the expertise to enter the entry-level job market with knowledge of sound principles of fitness and developmentally appropriate recreation.

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

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 125</td>
<td>Child Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 134</td>
<td>Health, Safety and Nutrition of Young Children</td>
<td>3</td>
</tr>
<tr>
<td>ES 253</td>
<td>Physical Education in Elementary Schools</td>
<td>3</td>
</tr>
<tr>
<td>ES 270</td>
<td>Cooperative Games</td>
<td>1</td>
</tr>
<tr>
<td>ES 271</td>
<td>Fitness Walking with Children</td>
<td>1</td>
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<tr>
<td>ES 272</td>
<td>Issues in Childhood Obesity</td>
<td>1</td>
</tr>
<tr>
<td>Total Required</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

KUMEYAAY STUDIES

The Associate in Arts program in Kumeyaay Studies is designed to provide an understanding of Kumeyaay history, culture and heritage. It is a multi-disciplinary degree, drawing from the sciences, humanities, world languages and history departments. Through specific coursework that encompasses on-site learning experiences, students will learn about the Kumeyaay Nation of San Diego's East County region.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Communicate in the Kumeyaay language at a basic level in a variety of settings;
• Acquire an understanding of Kumeyaay heritage, history, society and traditions;
• Gain sensitivity, globalism and cultural competence of a unique group of people.

Associate in Arts Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 133</td>
<td>Ethnology</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIO 134</td>
<td>Ethnobotany</td>
<td>3</td>
</tr>
<tr>
<td>BIO 135</td>
<td>Ethnobotany/Ethnology Lab</td>
<td>1</td>
</tr>
<tr>
<td>HIST 132</td>
<td>Kumeyaay History I: Precontact - 1900</td>
<td>3</td>
</tr>
<tr>
<td>HIST 133</td>
<td>Kumeyaay History II: 1900 - Present</td>
<td>3</td>
</tr>
<tr>
<td>HUM 116</td>
<td>Kumeyaay Arts and Culture</td>
<td>3</td>
</tr>
<tr>
<td>NAKY 120</td>
<td>Kumeyaay I</td>
<td>4</td>
</tr>
<tr>
<td>NAKY 121</td>
<td>Kumeyaay II</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Required 21

List A, Select One:

Course not taken above (BIO 133 or BIO 134) 3
NAKY 220 Kumeyaay III 4

Total Required 24-25

Plus General Education Requirements 2

Certificate of Specialization

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

Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:
• Communicate in the Kumeyaay language at a basic level in a variety of settings.
• Acquire an understanding of Kumeyaay heritage, history, society and traditions.
• Gain sensitivity, globalism and cultural competence of a unique peoples.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 133*</td>
<td>Ethnology</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIO 134</td>
<td>Ethnobotany</td>
<td>3</td>
</tr>
<tr>
<td>HIST 132</td>
<td>Kumeyaay History I: Precontact-1900</td>
<td>3</td>
</tr>
<tr>
<td>NAKY 120</td>
<td>Kumeyaay I</td>
<td>1</td>
</tr>
<tr>
<td>NAKY 220</td>
<td>Kumeyaay III</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Required 3-4

Plus General Education Requirements 4

Associate in Science Degree Requirements:

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

Total Required 17

Select two of the following:

Course not taken above (BIO 133 or BIO 134) 3
NAKY 220 Kumeyaay III 4

Total Required 29-33

Plus General Education Requirements 4

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.

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 Business Administration Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 120</td>
<td>Financial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>BUS 125</td>
<td>Business Law: Legal Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 128</td>
<td>Business Communication</td>
<td>3</td>
</tr>
<tr>
<td>BUS 155</td>
<td>Human Resources Management</td>
<td>3</td>
</tr>
<tr>
<td>BUS 156</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>BUS 195</td>
<td>Principles of Money Management for Success</td>
<td>3</td>
</tr>
<tr>
<td>ECON 120</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required 29-33

Plus General Education Requirements 4
I. MATHEMATICS FOR TRANSFER (AS-T)

This program is designed to prepare students for transfer to a California State University (CSU) with the intent of earning a B.S. degree in Mathematics. Since jobs requiring mathematical skills such as data analysis, problem solving, pattern recognition, statistics, and probability are in high demand, the mathematics major may benefit both educationally and economically from developing and pursuing an interest in mathematics. Mathematical skills and statistical methods are employed regularly by researchers testing hypotheses, by workers applying quality control in manufacturing, and by informed citizens who must evaluate information from the media in tabular, graphical, and report form in order to reach solutions. This major offers a foundation in these necessary skills. The emphasis is to prepare students for transfer to a four-year institution and/or for career preparation in a vocational or professional field. The following is required for the AS-T in Mathematics 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:
• Apply mathematical reasoning and problem solving strategies to analyze, interpret, and model applications from degree and transfer-level courses and programs in math, science, engineering, business, and technology.
• Select and apply appropriate definitions, postulates, and theorems to prove mathematical statements.

II. MATHEMATICS

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

Program Learning Outcomes

Upon successful completion of this program, students will be able to:
• Apply mathematical reasoning and problem solving strategies to analyze, interpret, and model applications in STEM or business programs.
• Select and apply appropriate definitions, postulates, and theorems to prove mathematical statements.

CAREER OPPORTUNITIES

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

†Bachelor Degree normally recommended

List B: Select one of the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 181 Intro to C++ Programming</td>
<td>4</td>
</tr>
<tr>
<td>MATH 160 Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>MATH 245 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 280 Analytic Geometry and Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 281 Multivariable Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 284 Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Any course from List A not selected above 3-5

Total Units for Major (3-6 units may be double-counted with GE) 19-21

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

Total Transferable Elective Units 3-5

Total Units for Degree 60

Please note: SDSU accepts this degree for students transferring into Mathematics (Science Emphasis) B.S.

List A: Select one of the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 284 Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 285 Differential Equations</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required 22-24

Plus General Education Requirements

Recommended Electives: Students planning to transfer to four-year institutions to complete a bachelor’s degree in Pure Mathematics, Applied Mathematics, or Statistics should select an emphasis in an applied discipline such as accounting, chemistry, computer science, economics, engineering, or physics. In particular, transfer students are strongly urged to elect the following physics courses:

PHYC 190 Mechanics and Heat 5
PHYC 200 Electricity and Magnetism 5
PHYC 210 Wave Motion and Modern Physics 5

Total Required 35

I. MUSIC FOR TRANSFER (AA-T)

The AA-T in Music for Transfer is designed to prepare students to transfer to a California State University (CSU) with the intent of earning a B.A. in music. Students who earn this degree will have the fundamental knowledge and skills necessary to succeed in a music degree at the baccalaureate level. The curriculum combines music theory, applied studies, and performance at the lower division level. The following is required for the AA-T in Music 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 Intersegmental General Education Transfer Curriculum (IGETC-CSU); see Degree Requirements and Transfer Information section for more information.

List A: Select one of the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 180 Analytic Geometry and Calculus I</td>
<td>5</td>
</tr>
<tr>
<td>MATH 280 Analytic Geometry and Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 281 Multivariable Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 284 Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Any course from List A not selected above 3-5

Total Units for Major (3-6 units may be double-counted with GE) 19-21

Total Units for CSU GE Breadth 37-39

Total Transferable Elective Units 3-5

Total Units for Degree 60

Please note: SDSU accepts this degree for students transferring into Mathematics (Science Emphasis) B.S.

List B: Select one of the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 245 Discrete Math</td>
<td>3</td>
</tr>
</tbody>
</table>

List C: Select one of the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 285 Differential Equations</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required 33

CAREER OPPORTUNITIES

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

†Bachelor Degree normally recommended

List B: Select one of the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 181 Intro to C++ Programming</td>
<td>4</td>
</tr>
<tr>
<td>MATH 160 Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>MATH 245 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 280 Analytic Geometry and Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 281 Multivariable Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 284 Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Any course from List A not selected above 3-5

Total Units for Major (3-6 units may be double-counted with GE) 19-21

Total Units for CSU GE Breadth 37-39

Total Transferable Elective Units 3-5

Total Units for Degree 60

Please note: SDSU accepts this degree for students transferring into Mathematics (Science Emphasis) B.S.
Program Learning Outcomes
Upon successful completion of this program, students will be able to:

- Analyze a musical score to determine its key, harmonic structure, musical style, and form.
- Identify musical elements in performances and relate them to their cultural and historical contexts.
- Use either the voice or a musical instrument to perform an intermediate level work with reliable technique and appropriate stylistic interpretation.
- Perform musical works in a large vocal or instrumental ensemble.
- Demonstrate proficiency on either a musical instrument or with the voice.

Associate in Arts Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 105</td>
<td>Music Theory and Practice I</td>
<td>4</td>
</tr>
<tr>
<td>MUS 106</td>
<td>Music Theory and Practice II</td>
<td>4</td>
</tr>
<tr>
<td>MUS 205</td>
<td>Music Theory and Practice III</td>
<td>4</td>
</tr>
<tr>
<td>MUS 206</td>
<td>Music Theory and Practice IV</td>
<td>4</td>
</tr>
<tr>
<td>MUS 190</td>
<td>Performance Studies</td>
<td>.5</td>
</tr>
<tr>
<td>MUS 191</td>
<td>Performance Studies</td>
<td>.5</td>
</tr>
<tr>
<td>MUS 290</td>
<td>Performance Studies</td>
<td>.5</td>
</tr>
</tbody>
</table>

Choose four units from the following large ensemble courses:

- MUS 112 Chamber Orchestra
- MUS 113 Chamber Orchestra
- MUS 214 Chamber Orchestra
- MUS 215 Chamber Orchestra
- MUS 152 Concert Band
- MUS 153 Concert Band
- MUS 252 Concert Band
- MUS 253 Concert Band
- MUS 159 Chorus
- MUS 258 Chorus
- MUS 259 Chorus

Total Units for Major: 22
Total Units for IGEC-CSU: 37
Total Transferable Elective Units: 1
Total Units for Degree: 60

Please note: SDSU accepts this degree for students transferring into Music B.A.

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

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

- Analyze a musical score to determine its key, harmonic structure, musical style, and form.
- Use the piano keyboard to demonstrate musical concepts and play intermediate level compositions.
- Use a digital audio workstation to record and edit digital audio files and notate musical ideas.
- Identify musical elements in performances and relate them to their cultural and historical contexts.
- Describe the typical duties of a secondary school music teacher.
- Use either the voice or a musical instrument to perform an intermediate level work with reliable technique and appropriate stylistic interpretation.
- Perform musical works in a large vocal or instrumental ensemble.

CAREER OPPORTUNITIES

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

III. MUSIC INDUSTRY STUDIES
This degree program provides lower division preparation for students wishing to transfer to a four-year program in Music Industry Studies. The curriculum combines training in music theory, literature and performance with studies in music technology and business. Transfer students should select the CSU GE Breadth or the IGEC transfer pattern (see Degree Requirements and Transfer Information section).

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

- Analyze a musical score to determine its key, harmonic structure, musical style, and form.
- Use the piano keyboard to demonstrate musical concepts and play beginning level compositions.
- Use a digital audio workstation to record and edit digital audio files and notate musical ideas.
- Identify musical elements in performances and relate them to their cultural and historical contexts.
- Describe the structure, components, and various career paths of the music industry.
- Demonstrate proficiency on either a musical instrument or with the voice.

CAREER OPPORTUNITIES

* Advertising Jingle Writer
* Arranger
* Artist and Repertoire Manager
* Artist Representative
* Arts Administrator
* Attorney specializing in Performing Arts
* Composer
* Concert Producer
* Copyist
* Instrumentalist
* Musical Instrument Manufacturer Representative
* Music Publisher
* Music Retail Manager
* Professional Songwriter
* Publicist
* Radio Programmer
* Record Company representative
* Record Producer
* Recording Studio Engineer
* Teacher
* Video Game Composer
* Vocalist
* Bachelor Degree or higher required

Associate in Art Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 104</td>
<td>Introduction to the Music Industry</td>
<td>3</td>
</tr>
<tr>
<td>MUS 105</td>
<td>Music Theory and Practice I</td>
<td>4</td>
</tr>
<tr>
<td>MUS 106</td>
<td>Music Theory and Practice II</td>
<td>4</td>
</tr>
<tr>
<td>MUS 110</td>
<td>Great Music Listening</td>
<td>3</td>
</tr>
<tr>
<td>MUS 116</td>
<td>Introduction to World Music</td>
<td>3</td>
</tr>
<tr>
<td>MUS 119</td>
<td>Cooperative Work Experience in Music Education</td>
<td>1</td>
</tr>
<tr>
<td>MUS 120</td>
<td>Introduction to Music Technology</td>
<td>3</td>
</tr>
<tr>
<td>MUS 126</td>
<td>Class Guitar I</td>
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<tr>
<td>MUS 132</td>
<td>Class Piano I</td>
<td>3</td>
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<tr>
<td>MUS 133</td>
<td>Class Piano II</td>
<td>3</td>
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<tr>
<td>MUS 170</td>
<td>Class Voice</td>
<td>2</td>
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<td>MUS 190</td>
<td>Performance Studies</td>
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<td>Performance Studies</td>
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<tr>
<td>MUS 232</td>
<td>Class Piano III</td>
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<td>MUS 233</td>
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<td>MUS 291</td>
<td>Performance Studies</td>
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<tr>
<td>MUS 108</td>
<td>Rock, Pop and Soul Ensemble</td>
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<td>MUS 109</td>
<td>Rock, Pop and Soul Ensemble</td>
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<tr>
<td>MUS 112</td>
<td>Chamber Orchestra</td>
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<td>MUS 113</td>
<td>Chamber Orchestra</td>
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<tr>
<td>MUS 136</td>
<td>Chamber Singers</td>
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<tr>
<td>MUS 137</td>
<td>Chamber Singers</td>
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<tr>
<td>MUS 152</td>
<td>Concert Band</td>
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<tr>
<td>MUS 153</td>
<td>Concert Band</td>
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<tr>
<td>MUS 156</td>
<td>Jazz Ensemble</td>
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<td>MUS 157</td>
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<tr>
<td>MUS 158</td>
<td>Chorus</td>
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<td>MUS 159</td>
<td>Chorus</td>
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<tr>
<td>MUS 208</td>
<td>Rock, Pop and Soul Ensemble</td>
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<td>MUS 209</td>
<td>Rock, Pop and Soul Ensemble</td>
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<td>MUS 214</td>
<td>Chamber Orchestra</td>
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<td>MUS 215</td>
<td>Chamber Orchestra</td>
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<td>MUS 236</td>
<td>Chamber Singers</td>
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<td>MUS 237</td>
<td>Chamber Singers</td>
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<td>MUS 252</td>
<td>Concert Band</td>
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<td>MUS 253</td>
<td>Concert Band</td>
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<tr>
<td>MUS 256</td>
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<td>MUS 257</td>
<td>Jazz Ensemble</td>
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<td>MUS 258</td>
<td>Chorus</td>
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<tr>
<td>MUS 259</td>
<td>Chorus</td>
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<tr>
<td>MUS 115</td>
<td>History of Rock Music</td>
<td>3</td>
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<tr>
<td>MUS 110</td>
<td>History of Jazz</td>
<td>3</td>
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<tr>
<td>MUS 122</td>
<td>Music in the United States</td>
<td>3</td>
</tr>
<tr>
<td>MUS 115</td>
<td>History of Rock Music</td>
<td>3</td>
</tr>
<tr>
<td>MUS 116</td>
<td>Introduction to World Music</td>
<td>3</td>
</tr>
<tr>
<td>MUS 117</td>
<td>Introduction to Music History and Literature</td>
<td>3</td>
</tr>
<tr>
<td>MUS 184</td>
<td>Digital Audio Recording and Production</td>
<td>3</td>
</tr>
</tbody>
</table>

Select two of the following:

- MUS 110 Great Music Listening
- MUS 111 History of Jazz
- MUS 114 Music in the United States
- MUS 115 History of Rock Music
- MUS 116 Introduction to World Music
- MUS 117 Introduction to Music History and Literature
- MUS 184 Digital Audio Recording and Production

Select one of the following:

- BUS 120 Financial Accounting
- BUS 125 Business Law: Legal Environment of Business
Select four of the following:

MUS 108 Rock, Pop and Soul Ensemble 1
MUS 109 Rock, Pop and Soul Ensemble 1
MUS 130A World Music Ensemble: African Percussion 1
MUS 130B World Music Ensemble: Sundanese Gamelan 1
MUS 130C World Music Ensemble: Latin American Music 1
MUS 131A World Music Ensemble: African Percussion 1
MUS 131B World Music Ensemble: Sundanese Gamelan 1
MUS 131C World Music Ensemble: Latin American Music 1
MUS 136 Chamber Singers 1
MUS 137 Chamber Singers 1
MUS 152 Concert Band 1
MUS 153 Concert Band 1
MUS 156 Jazz Ensemble .5
MUS 157 Jazz Ensemble .5
MUS 158 Chorus 1
MUS 159 Chorus 1
MUS 190 Performance Studies .5
MUS 191 Performance Studies .5
MUS 208 Rock, Pop and Soul Ensemble 1
MUS 209 Rock, Pop and Soul Ensemble 1
MUS 230A World Music Ensemble: African Percussion 1
MUS 230B World Music Ensemble: Sundanese Gamelan 1
MUS 230C World Music Ensemble: Latin American Music 1
MUS 231A World Music Ensemble: African Percussion 1
MUS 231B World Music Ensemble: Sundanese Gamelan 1
MUS 231C World Music Ensemble: Latin American Music 1
MUS 236 Chamber Singers 1
MUS 237 Chamber Singers 1
MUS 252 Concert Band 1
MUS 253 Concert Band 1
MUS 256 Jazz Ensemble 1
MUS 257 Jazz Ensemble 1
MUS 258 Chorus 1
MUS 259 Chorus 1
MUS 290 Performance Studies .5
MUS 291 Performance Studies .5

Total Required 36-39
Plus General Education Requirements

Associate Degree Programs and Certificates

Associate in Science Degree Requirements:

Course Title Units
OH 120 Fundamentals of Ornamental Horticulture 3
OH 130 Plant Pest Control 3
OH 140 Soils 3
OH 170 Plant Materials: Trees and Shrubs 3
OH 260 Arboriculture 3
OH 290* Cooperative Work Experience Education 3

Select two of the following:

OH 263 Urban Forestry 1
OH 264 Safe Work Practices in Tree Climbing and Arboriculture 1
OH 266 Science in Practice for Arboriculture 1

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

Select nine units from the following:

OH 102 Xeriscape: Water Conservation in the Landscape 2
OH 172 Introduction to Landscape Design 3
OH 174 Turf and Ground Cover Management 3
OH 221 Landscape Construction: Irrigation and Carpentry 3
OH 235 Principles of Landscape Irrigation 4
OH 250 Landscape Water Management 2
OH 265 Sustainable Urban Landscapes Principles and Practices 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

Total Required 93
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 Arboriculture. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

II. FLORAL DESIGN

This degree program is designed for those individuals seeking careers in the floral industry, or for those seeking to upgrade their existing skills and prepare for further training. Course work is directed toward skills, concepts and practices used in the commercial floral industry with an emphasis in hands-on training. There is also an emphasis on the business skills needed to succeed as a floral industry entrepreneur.

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

• Describe proper and safe principles and practices of tree climbing.
• Describe the principles of tree biology and physiology for growth management.
• Demonstrate proper tree pruning procedures per industry standards.
• Identify common biotic and abiotic problems for trees common to Southern California landscapes and list appropriate control measures.
• Conduct a visual tree assessment for tree risk or value appraisal.
• Draft a tree preservation plan for a construction site.

Associate in Science Degree Requirements:

Course Title Units

OH 120 Fundamentals of Ornamental Horticulture 3
OH 130 Plant Pest Control 3
OH 140 Soils 3
OH 170 Plant Materials: Trees and Shrubs 3
OH 260 Arboriculture 3
OH 290* Cooperative Work Experience Education 3

Select two of the following:

OH 263 Urban Forestry 1
OH 264 Safe Work Practices in Tree Climbing and Arboriculture 1
OH 266 Science in Practice for Arboriculture 1

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

Select nine units from the following:

OH 102 Xeriscape: Water Conservation in the Landscape 2
OH 172 Introduction to Landscape Design 3
OH 174 Turf and Ground Cover Management 3
OH 221 Landscape Construction: Irrigation and Carpentry 3
OH 235 Principles of Landscape Irrigation 4
OH 250 Landscape Water Management 2
OH 265 Sustainable Urban Landscapes Principles and Practices 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

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

• Identify and explain the principles and elements of design common to the retail floral industry and utilize these guidelines in the reproduction and construction of independent floral arrangements, events and décor.
• Identify, evaluate and discuss in correct industry vocabulary fresh floral product and permanent botanical materials, hard goods, and trends in European and Asian design influence.
• Prepare an original event proposal based on site analysis for a special occasion to include an appropriate wholesale budget, estimate design recipes, fresh and hard goods product.
• Compare and contrast retail florist businesses in shop operations, workstations, sales and consultation areas, visual displays, customer relations, and typical business practices including labor relations, insurance, advertising, accounting and license requirements.

Associate in Science Degree Requirements:

Course Title Units

OH 120 Fundamentals of Ornamental Horticulture 3
OH 130 Plant Pest Control 3
OH 140 Soils 3
OH 170 Plant Materials: Trees and Shrubs 3
OH 260 Arboriculture 3
OH 290* Cooperative Work Experience Education 3

Select two of the following:

OH 263 Urban Forestry 1
OH 264 Safe Work Practices in Tree Climbing and Arboriculture 1
OH 266 Science in Practice for Arboriculture 1

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

Select nine units from the following:

OH 102 Xeriscape: Water Conservation in the Landscape 2
OH 172 Introduction to Landscape Design 3
OH 174 Turf and Ground Cover Management 3
OH 221 Landscape Construction: Irrigation and Carpentry 3
OH 235 Principles of Landscape Irrigation 4
OH 250 Landscape Water Management 2
OH 265 Sustainable Urban Landscapes Principles and Practices 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

Total Required 93
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 Arboriculture. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

II. FLORAL DESIGN

This degree program is designed for those individuals seeking careers in the floral industry, or for those seeking to upgrade their existing skills and prepare for further training. Course work is directed toward skills, concepts and practices used in the commercial floral industry with an emphasis in hands-on training. There is also an emphasis on the business skills needed to succeed as a floral industry entrepreneur.

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

• Identify and explain the principles and elements of design common to the retail floral industry and utilize these guidelines in the reproduction and construction of independent floral arrangements, events and décor.
• Identify, evaluate and discuss in correct industry vocabulary fresh floral product and permanent botanical materials, hard goods, and trends in European and Asian design influence.
• Prepare an original event proposal based on site analysis for a special occasion to include an appropriate wholesale budget, estimate design recipes, fresh and hard goods product.
• Compare and contrast retail florist businesses in shop operations, workstations, sales and consultation areas, visual displays, customer relations, and typical business practices including labor relations, insurance, advertising, accounting and license requirements.

Associate in Science Degree Requirements:

Course Title Units

OH 120 Fundamentals of Ornamental Horticulture 3
OH 130 Plant Pest Control 3
OH 140 Soils 3
OH 170 Plant Materials: Trees and Shrubs 3
OH 260 Arboriculture 3
OH 290* Cooperative Work Experience Education 3

Select two of the following:

OH 263 Urban Forestry 1
OH 264 Safe Work Practices in Tree Climbing and Arboriculture 1
OH 266 Science in Practice for Arboriculture 1

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

Select nine units from the following:

OH 102 Xeriscape: Water Conservation in the Landscape 2
OH 172 Introduction to Landscape Design 3
OH 174 Turf and Ground Cover Management 3
OH 221 Landscape Construction: Irrigation and Carpentry 3
OH 235 Principles of Landscape Irrigation 4
OH 250 Landscape Water Management 2
OH 265 Sustainable Urban Landscapes Principles and Practices 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

Total Required 93
Plus General Education Requirements

*Student must complete six units within the major at Cuyamaca College to be eligible for this course.
Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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<tr>
<td>OH 114</td>
<td>Floral Design I</td>
<td>3</td>
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<tr>
<td>OH 116</td>
<td>Floral Design II</td>
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<tr>
<td>OH 117</td>
<td>Wedding Design I</td>
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<tr>
<td>OH 118</td>
<td>Special Occasion Floral Design</td>
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</tr>
<tr>
<td>OH 120</td>
<td>Fundamentals of Ornamental Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>OH 180</td>
<td>Plant Materials: Annuals and Perennials</td>
<td>3</td>
</tr>
<tr>
<td>OH 290*</td>
<td>Cooperative Work Experience Education</td>
<td>3</td>
</tr>
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Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 110</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 111</td>
<td>Entrepreneurship: Starting and Developing a Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 125</td>
<td>Business Law: Legal Environment of Business</td>
<td>3</td>
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Select nine units from the following:

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>ART 120</td>
<td>Two-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 124</td>
<td>Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>BUS 111</td>
<td>Entrepreneurship: Starting and Developing a Business</td>
<td>3</td>
</tr>
<tr>
<td>OH 121</td>
<td>Plant Propagation</td>
<td>3</td>
</tr>
<tr>
<td>OH 170</td>
<td>Plant Materials: Trees and Shrubs</td>
<td>3</td>
</tr>
<tr>
<td>OH 200</td>
<td>Greenhouse Plant Production</td>
<td>3</td>
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<tr>
<td>OH 278</td>
<td>Business Management for Ornamental Horticulture</td>
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<tr>
<td>OH/CADD 200*</td>
<td>Introduction to Computer-Aided Design</td>
<td>3</td>
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Total Required: 33

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 Floral Design. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

III. GOLF COURSE AND SPORTS TURF MANAGEMENT

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

Program Learning Outcomes

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

- Demonstrate and practice standardized safety procedures as they apply to golf and sports turf management.
- Identify and manage primary and secondary noxious weeds.
- Identify and manage common biotic and abiotic problems associated with turf management in Southern California.
- Demonstrate knowledge of appropriate use and maintenance of equipment common to golf and sports turf management.
- Identify 88 trees and shrubs common to Southern California.
- Identify water quality impact on turfgrass and plant material species and the relationship to soil conditions.
- Demonstrate the impact of various water sources on golf course maintenance budgets.
- Using principles of irrigation hydraulics, calculate friction loss in pipe, determine proper pipe sizing using the friction factor and velocity limit method, and determine appropriate component sizing.
- Identify and describe the proper installation of irrigation system components.
- Using standard industry practices, develop guidelines and demonstrate the ability to perform proper fertilizing, pruning, mulch application and irrigation of Southern California landscapes.
- Identify and explain labor relations, business plans, and lease requirements for the golf and sports turf industry.
- Demonstrate the ability to install concrete, masonry and plant material.

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH 120</td>
<td>Fundamentals of Ornamental Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>OH 130</td>
<td>Plant Pest Control</td>
<td>3</td>
</tr>
<tr>
<td>OH 140</td>
<td>Soils</td>
<td>3</td>
</tr>
<tr>
<td>OH 170</td>
<td>Plant Materials: Trees and Shrubs</td>
<td>3</td>
</tr>
<tr>
<td>OH 174</td>
<td>Turf and Ground Cover Management</td>
<td>3</td>
</tr>
<tr>
<td>OH 235</td>
<td>Principles of Landscape Irrigation</td>
<td>4</td>
</tr>
<tr>
<td>OH 290*</td>
<td>Cooperative Work Experience Education</td>
<td>3</td>
</tr>
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Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>BUS 110</td>
<td>Introduction to Business</td>
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</tr>
<tr>
<td>BUS 111</td>
<td>Entrepreneurship: Starting and Developing a Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 125</td>
<td>Business Law: Legal Environment of Business</td>
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Select seven units from the following:

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>OH 102</td>
<td>Xeriscape: Water Conservation in the Landscape</td>
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<tr>
<td>OH 220</td>
<td>Landscape Construction: Concrete and Masonry</td>
<td>3</td>
</tr>
<tr>
<td>OH 221</td>
<td>Landscape Construction: Irrigation and Carpentry</td>
<td>3</td>
</tr>
<tr>
<td>OH 250</td>
<td>Landscape Water Management</td>
<td>2</td>
</tr>
<tr>
<td>OH 265</td>
<td>Golf Course and Sports Turf Management</td>
<td>3</td>
</tr>
<tr>
<td>OH 275</td>
<td>Diagnosing Horticultural Problems</td>
<td>3</td>
</tr>
<tr>
<td>OH 276</td>
<td>Horticultural Equipment Repair and Maintenance</td>
<td>3</td>
</tr>
<tr>
<td>OH 278</td>
<td>Business Management for Ornamental Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 120</td>
<td>Spanish I</td>
<td>3</td>
</tr>
</tbody>
</table>

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 Golf Course and Sports Turf Management. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

IV. IRRIGATION TECHNOLOGY

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

Program Learning Outcomes

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

- Explain the relationships between plants and their soil and water environment including the use of recycled water.
- Demonstrate an understanding of landscape irrigation hydraulics.
- Identify irrigation system components and demonstrate their proper installation.
- Demonstrate a basic understanding of irrigation design principles.
- Demonstrate the ability to calculate an irrigation schedule.
- Demonstrate the ability to diagnose irrigation system problems related to valves, wiring and hydraulics.
- Explain the importance of, and best practices for, water conservation in regards to water sources, water quality and regulations.
- Gain practical experience working in the landscape industry.

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH 102</td>
<td>Xeriscape: Water Conservation in the Landscape</td>
<td>2</td>
</tr>
<tr>
<td>OH 120</td>
<td>Fundamentals of Ornamental Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>OH 140</td>
<td>Soils</td>
<td>3</td>
</tr>
<tr>
<td>OH 221</td>
<td>Landscape Construction: Irrigation and Carpentry</td>
<td>3</td>
</tr>
<tr>
<td>OH 235</td>
<td>Principles of Landscape Irrigation</td>
<td>4</td>
</tr>
<tr>
<td>OH 250</td>
<td>Landscape Water Management</td>
<td>2</td>
</tr>
<tr>
<td>OH 290*</td>
<td>Cooperative Work Experience Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 110</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 111</td>
<td>Entrepreneurship: Starting and Developing a Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 125</td>
<td>Business Law: Legal Environment of Business</td>
<td>3</td>
</tr>
</tbody>
</table>

Select nine units from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH 130</td>
<td>Plant Pest Control</td>
<td>3</td>
</tr>
<tr>
<td>OH 170</td>
<td>Plant Materials: Trees and Shrubs</td>
<td>3</td>
</tr>
<tr>
<td>OH 171</td>
<td>Landscape Drafting</td>
<td>1</td>
</tr>
<tr>
<td>OH 172</td>
<td>Introduction to Landscape Design</td>
<td>3</td>
</tr>
<tr>
<td>OH 174</td>
<td>Turf and Ground Cover Management</td>
<td>3</td>
</tr>
<tr>
<td>OH/CADD 200*</td>
<td>Introduction to Computer-Aided Design</td>
<td>3</td>
</tr>
<tr>
<td>OH 225</td>
<td>Landscape Contracting</td>
<td>3</td>
</tr>
<tr>
<td>OH 238</td>
<td>Irrigation System Design</td>
<td>3</td>
</tr>
<tr>
<td>OH 276</td>
<td>Horticultural Equipment Repair and Maintenance</td>
<td>3</td>
</tr>
<tr>
<td>OH 278</td>
<td>Business Management for Ornamental Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 120</td>
<td>Spanish I</td>
<td>3</td>
</tr>
</tbody>
</table>

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 Irrigation Technology. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.
V. LANDSCAPE DESIGN
This major provides students with a systematic, process-oriented approach to landscape design for residential landscapes. The curriculum is designed to investigate the current trends in landscape design and the technologies used in the construction of the projects. Course work is designed for entry level skills, upgrading of existing skills, and for transfer to four-year degree programs. Graduates are employed by landscape architects, landscape contractors, public agencies or may be self-employed.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Prepare conceptual landscape plans for residential clients.
• Measure a site then draft a site plan using hand drafting and computer aided drafting.
• Analyze project sites for assets and constraints.
• Create an aesthetically pleasing, sustainable, and feasible landscape design.
• Produce graphically pleasing landscape concept plans, elevations, and sections using both hand drafting and computer aided drafting techniques.
• Analyze site topography (including relief, slope and aspect) as required to prepare fine grading plans.
• Identify and describe the palette of materials used in landscape construction.
• Identify at least 250 trees, shrubs, annuals, and perennials used in Southern California landscaping.
• Demonstrate the ability to locate plants appropriately on a planting plan.
• Apply water conserving and sustainable landscape ideas to designs.
• Quantify the irrigation needs of the specified plants and prepare effective irrigation plans.
• Identify and explain business practices and legal considerations associated with developing a landscape business.
• Gain practical experience working in the landscape industry.

Associate in Science Degree Requirements:
Course Title Units
OH 102 Xeriscape: Water Conservation in the Landscape 2
OH 170 Plant Materials: Trees and Shrubs 3
OH 171 Landscape Drafting 1
OH 172* Introduction to Landscape Design 3
OH 173 Intermediate Landscape Design 3
OH 175 Advanced Landscape Design 3
OH 180 Plant Materials: Annuals and Perennials 3
OH 210* Introduction to Computer-Aided Landscape Design 3
OH 220 Landscape Construction: Concrete and Masonry 3
OH 235 Principles of Landscape Irrigation 4
OH 278 Business Management for Ornamental Horticulture 3
OH 290** Cooperative Work Experience Education 3
Total Required 32

*May also be offered at Southwestern College as LA 200.
**May also be offered at Southwestern College as LA 201.
***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 Design. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

VI. LANDSCAPE TECHNOLOGY
Landscaping 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
Total Required 31

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

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 276 Horticultural Equipment Repair and Maintenance 3
OH 278 Business Management for Ornamental Horticulture 3
SPAN 120 Spanish I 5
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.

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

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Identify 250 trees, shrubs, annuals, perennials and turf grass species commonly used in Southern California landscapes.
• Explain the principles of plant structure function and plant growth.
• Demonstrate an understanding of common plant propagation practices.
• Cultivate horticultural crops in both natural and artificial environments common in the horticulture industry.
• Demonstrate an understanding of soil principles.
• Explain how to produce a business plan for the nursery industry.
• Gain practical experience working in the landscape industry.
Upon successful completion of this certificate, students will be able to:

- Understand the basic principles of soil science, soil fertility and water as it applies to plant growth and health of grapes in production.
- Understand the basic principles of integrated pest management.
- Identify the insect insect orders.
- Identify 10 common landscape and vineyard weeds.
- Understand the basic principles of irrigation system hydrodynamics in landscapes and vineyards.
- Understand the basic principles of irrigation design.
- Demonstrate the basic principles of irrigation construction in landscapes and vineyards.

Program Learning Outcomes

**Certificate Requirements**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH 105A Edibles in Urban Landscapes for Apprentices</td>
<td>1.5</td>
</tr>
<tr>
<td>OH 120A Fundamentals of Ornamental Horticulture for Apprentices</td>
<td>3</td>
</tr>
<tr>
<td>OH 130A Plant Pest Control for Apprentices</td>
<td>3</td>
</tr>
<tr>
<td>OH 235A Principles of Landscape Irrigation for Apprentices</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Required** 11.5

Program Learning Outcomes

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

- Understand the basic principles of plant growth.
- Identify 125 trees and shrub species commonly used in Southern California landscapes.
- Understand the basic principles of soil science as they relate to plant growth and plant nutrition.
• Apply basic horticultural knowledge to specific field of study in ornamental horticulture.
• Understand business principles as they apply to working in ornamental horticulture.

Certificate Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH 120</td>
<td>Fundamentals of Ornamental Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>OH 170</td>
<td>Plant Materials: Trees and Shrubs</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH 130</td>
<td>Plant Pest Control</td>
<td>3</td>
</tr>
<tr>
<td>OH 140</td>
<td>Soils</td>
<td>3</td>
</tr>
<tr>
<td>OH 180</td>
<td>Plant Materials: Annuals and Perennials</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 110</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 111</td>
<td>Entrepreneurship: Starting and Developing a Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 125</td>
<td>Business Law: Legal Environment of Business</td>
<td>3</td>
</tr>
</tbody>
</table>

Select at least three units from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH 114</td>
<td>Floral Design I</td>
<td>3</td>
</tr>
<tr>
<td>OH 121</td>
<td>Plant Propagation</td>
<td>3</td>
</tr>
<tr>
<td>OH 125</td>
<td>Landscape Technician Principles 1</td>
<td>1</td>
</tr>
<tr>
<td>OH 126</td>
<td>Landscape Technician Principles 2</td>
<td>1</td>
</tr>
<tr>
<td>OH 127</td>
<td>Landscape Technician Principles 3</td>
<td>1</td>
</tr>
<tr>
<td>OH 172</td>
<td>Introduction to Landscape Design</td>
<td>3</td>
</tr>
<tr>
<td>OH 174</td>
<td>Turf and Ground Cover Management</td>
<td>3</td>
</tr>
<tr>
<td>OH 220</td>
<td>Landscape Construction: Concrete and Masonry</td>
<td>3</td>
</tr>
<tr>
<td>OH 221</td>
<td>Landscape Construction: Irrigation and Carpentry</td>
<td>3</td>
</tr>
<tr>
<td>OH 260</td>
<td>Arboriculture</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required 15

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

PARALEGAL STUDIES

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

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

1. Legal Research, Analysis and Writing
2. Ethics and the Mechanics of Law
3. Integration of Substantive and Procedural Law

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

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

Paralegals may not provide legal services directly to the public, except as permitted by law.

Program Learning Outcomes

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

• Apply the research, analytical skills and college-level writing abilities necessary to assist attorneys in the practice of law.
• Conduct oneself in an ethical and professional manner when confronted with a law office related conflict scenario.

CAREER OPPORTUNITIES

Claim Examiner
Compensation and Benefits Manager
Compliance and Enforcement Inspector
Contract Consultant
Forms and Procedures Specialist
Freelance Paralegal
*Labor Relations Specialist
Legal Aide
Legal Assistant
Legal Research Assistant
Legal Technician
Occupational Safety and Health Worker
Paralegal
Patent Agent
Title Examiner
*Bachelor Degree or higher required
*Bachelor Degree normally recommended

It is recommended that incoming students complete ENGL 109 prior to taking any Paralegal Studies classes.

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 120-121</td>
<td>Comprehensive Word Levels I–II</td>
<td>2</td>
</tr>
<tr>
<td>BOT 122</td>
<td>Comprehensive Word, Level III</td>
<td>1</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOT 151</td>
<td>Using Microsoft Outlook</td>
<td>1</td>
</tr>
<tr>
<td>BOT 115</td>
<td>Essential Excel</td>
<td>1</td>
</tr>
<tr>
<td>BUS 125</td>
<td>Business Law: Legal Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>PARA 100</td>
<td>Introduction to Paralegal Studies</td>
<td>3</td>
</tr>
<tr>
<td>PARA 110</td>
<td>Civil Litigation Practice and Procedure</td>
<td>3</td>
</tr>
<tr>
<td>PARA 130</td>
<td>Legal Research and Writing</td>
<td>3</td>
</tr>
<tr>
<td>PARA 132</td>
<td>Computer Assisted Legal Research (CALR)</td>
<td>3</td>
</tr>
<tr>
<td>PARA 135</td>
<td>Bankruptcy Law</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required 27

Select at least six units from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARA 120</td>
<td>Administrative Law</td>
<td>3</td>
</tr>
<tr>
<td>PARA 125</td>
<td>Business Organizations</td>
<td>1</td>
</tr>
<tr>
<td>PARA 140</td>
<td>Criminal Law and Procedures</td>
<td>3</td>
</tr>
<tr>
<td>PARA 145</td>
<td>Estate Planning and Administration of Estates</td>
<td>3</td>
</tr>
<tr>
<td>PARA 150</td>
<td>Family Law</td>
<td>3</td>
</tr>
<tr>
<td>PARA 160</td>
<td>Personal Injury</td>
<td>1</td>
</tr>
<tr>
<td>PARA 170</td>
<td>Worker’s Compensation</td>
<td>1</td>
</tr>
<tr>
<td>PARA 175</td>
<td>Electronic Discovery: Practice and Procedure</td>
<td>1</td>
</tr>
<tr>
<td>PARA 250*</td>
<td>Internship</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Total Required 27

Plus General Education Requirements

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

Recommended Elective: BUS 128

GENERAL EDUCATION REQUIREMENTS FOR THE PARALEGAL STUDIES DEGREE:

AREA A–LANGUAGE AND RATIONALITY

(Minimum of 6 semester units)

One course from each area:

1. Written Communication
   ENGL 120

2. Oral Communication and Analytical Thinking
   COMM 120, 122, 130, 137, 145
   ENGR 100
   MATH 103, 110, 120, 125, 160, 170, 175, 176, 178, 180, 245, 280, 281, 284
   PHIL 125, 130
   PSY 215

AREA B–NATURAL SCIENCES

(Minimum of 4 semester units)

A course that includes a laboratory (laboratory courses are underlined):

ANTH 130
ASTR 110, 112
BIO 112, 115, 122, 124, 126, 130, 131, 140, 152, 230, 249
CHEM 102, 105*, 115*, 116, 120, 141
GEOG 120, 121
GEOL 104, 110, 111
OCEA 112, 113
PHYS 110, 120, 131, 190, 200, 210

*Students will not receive credit for more than one of the following courses: CHEM 113, 115, 120.

AREA C–HUMANITIES

(Minimum of 5 semester units)

One of the following courses:

ARAM 120, 121, 220
ARBC 120, 121, 145, 220, 221, 250, 251
ART 100, 120, 124, 129, 140, 141, 143, 144, 145, 146, 148
ASL 120, 121, 140, 220, 221
ENGL 122, 201, 202, 207, 214, 217, 221, 222, 231, 232, 270, 271, 275, 276, 277
FREN 120, 121, 220, 221, 250, 251
HIST 100, 101, 105, 106
HUM 110, 115, 116, 120, 140, 155
ITAL 120, 121, 220
MUS 110, 111, 114, 115, 116, 117
NAKY 120, 121, 220
PHIL 110, 115, 117, 140, 160, 170
RELG 120, 130, 160, 170
SPAN 120, 121, 141, 145, 220, 221, 250, 251
THTR 110, 120, 121

AREA D–SOCIAL AND BEHAVIORAL SCIENCES

(Minimum of 3 semester units)

One of the following courses:

ANTH 130
CD 115, 125, 131, 145
COMM 110, 124
ECON 110, 120, 121
ENGR 100
HIST 108, 119, 122, 123, 124, 130, 131, 132, 133, 180, 181
HED 120, 201
HED 125, 126, 127, 128, 129, 130
HED 200, 201
HST 106
MATH 103, 110, 120, 125, 160, 170, 175, 176, 178, 180, 245, 280, 281, 284
PHIL 125, 130
PSY 120, 125, 134, 138, 140, 150, 170, 220
SOC 120, 125, 130
DEGREE REQUIREMENTS:
Cuyamaca College will confer the Degree of Associate in Science in Paralegal Studies upon students who successfully complete the following requirements:

1. A minimum of 60 semester units of college work.
2. Competency Requirements
   A. Completion of ENGL 120 with a grade of "C" or better or "P*".
   B. Completion of MATH 103 or a higher numbered mathematics class, or a statistics course from another discipline that has intermediate algebra as a prerequisite, with a grade of "C" or better or a grade of "P*" or completion of Accuplacer Assessment placing into a class higher than MATH 103 or 110.
3. Exercise Science Degree Requirements
   Two activity courses in exercise science are required for graduation from Cuyamaca College. These courses are marked with an asterisk in the Course Descriptions section.
   A. If medical reasons necessitate exclusion from exercise science, a medical statement must be on file with the Admissions and Records Office. Adaptive exercise science classes are available.
   B. Veterans who have completed at least one year of honorable active service will receive up to three units of credit for exercise science which will satisfy the activity requirement for graduation. To receive credit for military service, a DD-214 and appropriate military records must be submitted to the Admissions and Records Office.
4. Achievement of a "C" average (2.0 GPA) in all college work counted toward general education requirements.
5. Achievement of a "C" grade or better in all courses counted toward the major. (P/NP grading not accepted for the major.)
6. A maximum of 12 "P*" semester units taken in regular course work at this institution may be counted toward the 60 semester units required for graduation but shall not be included as part of the requirements for the major.
7. A minimum of 12 semester units of Legal Specialty courses must be completed at Cuyamaca College.
   *A grade of "P" (Pass) represents a "C" grade or better.

For more information regarding degree requirements, see Degree Requirements and Transfer Information section.

PHILOSOPHY FOR TRANSFER (AA-T)

The Associate in Arts in Philosophy for Transfer (AA-T in Philosophy) deals with fundamental issues that have long haunted thinkers for many centuries. The major explores and seeks to understand values and the nature of reality by examining and questioning existence and experience. The degree prepares students for undergraduate study in philosophy. The following is required for the AA-T in Philosophy 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 Curriculum (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:

- Identify and discuss the principle questions of universal concern raised in philosophy, including but not limited to the following: What is knowledge? Is there meaning to life?
- Does free will exist? Why should I be moral?
- Implement critical thinking techniques to enhance reading and writing skills.
- Identify, analyze and discuss cross-cultural perspectives related to the philosophical issues being considered.
- Demonstrate philosophical thinking by correct use of terminology/argumentation in evaluating various themes discussed.

Associate in Arts Degree Requirements:

Core Curriculum: Select two:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 110</td>
<td>A General Introduction to Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 130</td>
<td>Logic</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 140</td>
<td>Problems in Ethics</td>
<td>3</td>
</tr>
</tbody>
</table>

List A: Select one:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any course from Core not used</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PHIL 115</td>
<td>History of Philosophy I: Ancient</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 117</td>
<td>History of Philosophy II: Modern and Contemporary</td>
<td>3</td>
</tr>
</tbody>
</table>

List B: Select two:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any course from List A not used</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>HIST 105</td>
<td>Early Western Civilization</td>
<td>3</td>
</tr>
<tr>
<td>HIST 106</td>
<td>Modern Western Civilization</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 170</td>
<td>Philosophy of Religion: A Cross-Cultural Introduction</td>
<td>3</td>
</tr>
<tr>
<td>RELG 120</td>
<td>World Religions</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Degree 60
Total Units for CSU GE Breadth or IGETC-CSU 37-39
Total Transferable Elective Units 11-18
Total Units for Degree 60

Please note: SDSU accepts this degree for students transferring into Philosophy B.A.

PHYSICAL SCIENCE

The physical science major is designed to give students working toward a bachelor’s degree a well-balanced, lower division program. The course sequence emphasizes fundamental concepts and problem solving. The degree requirements are typical of what four-year colleges and universities require; see www.assist.org for requirements of specific transfer institution.

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

- Analyze how astronomers obtain information about stars, what information can be obtained and how the information is used.
- Predict periodic trends in ionization energy, atomic size, electron affinity and acid-base properties.
- Calculate changes in enthalpy, entropy, and free energy for chemical reactions, phase changes, solution processes, and elementary molecular processes using tables of thermodynamic data.
- Write systematic names for carbon based compounds.
- Working knowledge of the Theory of Plate Tectonics as it relates to sea floor spreading, subduction, continental drift and the evolution of ocean basins, continents and mountains.
- Evaluate derivatives of algebraic, trigonometric, logarithmic and exponential functions.
- Evaluate integrals using appropriate techniques (such as: by parts, trig substitution, etc.)
- Apply Green’s, Stokes’ and Gauss’ Theorems.
- Use conservation of energy and conservation of momentum concepts.
- Use Maxwell’s Equations to solve problems in electricity and magnetism.
- Use the basic concepts of modern physics: special relativity, photon behavior, matter waves, the uncertainty principle, quantum mechanics in one and three dimensions, statistical physics and nuclear physics.

CAREER OPPORTUNITIES

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

- Astronomer
- Cartographic Technician
- Chemist
- Geodetic Technician
- Geologist
- Meteorologist
- Meteorological Technician
- Oceanographer
- Patent Lawyer
- Physical Science Teacher
- Physical Science Technician
- Physicist
I. PHYSICS FOR TRANSFER (AS-T)

Physics is the study of the relationship between matter and energy in the universe. The AS-T in Physics for Transfer degree is designed to prepare students to transfer to a California State University (CSU) with the intent of earning a baccalaureate degree in physics. The curriculum is designed to provide students working toward a bachelor’s degree a well-balanced, lower division program by emphasizing fundamental concepts and problem solving. The degree requirements are typical of what four-year colleges and universities require; see www.assist.org for requirements of specific transfer institution.

The following is required for the AS-T in Physics 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 Intersegmental General Education Transfer Curriculum (IGETC-CSU), see Degree Requirements and Transfer Information section for more information.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:
- Evaluate derivatives of algebraic, trigonometric, logarithmic and exponential functions.
- Evaluate integrals using appropriate techniques (such as: by parts, trig substitution, etc.)
- Apply Green’s, Stokes’ and Gauss’ Theorems.
- Use conservation of energy and conservation of momentum concepts.
- Use Maxwell’s Equations to solve problems in electricity and magnetism.
- Use the basic concepts of modern physics: special relativity, photon behavior, matter waves, the uncertainty principle, quantum mechanics in one and three dimensions, statistical physics and nuclear physics.

II. PHYSICS

Physics is the study of the relationship between matter and energy in the universe. The curriculum is designed to provide students working toward a bachelor’s degree a well-balanced, lower division program by emphasizing fundamental concepts and problem solving. The degree requirements are typical of what four-year colleges and universities require; see www.assist.org for requirements of specific transfer institution.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:
- Predict periodic trends in ionization energy, atomic size, electron affinity and acid-base properties.
- Calculate changes in enthalpy, entropy, and free energy for chemical reactions, phase changes, solution processes, and elementary molecular processes using tables of thermodynamic data.
- Write systematic names for carbon based compounds.
- Evaluate derivatives of algebraic, trigonometric, logarithmic and exponential functions.
- Evaluate integrals using appropriate techniques (such as: by parts, trig substitution, etc.).
- Apply Green’s, Stokes’ and Gauss’ Theorems.
- Use conservation of energy and conservation of momentum concepts.
- Use Maxwell’s Equations to solve problems in electricity and magnetism.
- Use the basic concepts of modern physics: special relativity, photon behavior, matter waves, the uncertainty principle, quantum mechanics in one and three dimensions, statistical physics and nuclear physics.

CAREER OPPORTUNITIES

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

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 180</td>
<td>Analytic Geometry and Calculus I</td>
<td>5</td>
</tr>
<tr>
<td>MATH 280</td>
<td>Analytic Geometry and Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 281</td>
<td>Multivariable Calculus</td>
<td>4</td>
</tr>
<tr>
<td>PHYC 190</td>
<td>Mechanics and Heat</td>
<td>5</td>
</tr>
<tr>
<td>PHYC 200</td>
<td>Electricity and Magnetism</td>
<td>5</td>
</tr>
<tr>
<td>PHYC 210</td>
<td>Wave Motion and Modern Physics</td>
<td>5</td>
</tr>
</tbody>
</table>

Total Units for Major (7 units may be double-counted with GE) 28
Total Units for IGETC-CSU 37
Total Transferable Units 2
Total Units for Degree 60

Please note: SDSU accepts this degree for students transferring into the B.S. Physics (General) or B.S. Physics (Modern Optics Emphasis).

POLITICAL SCIENCE • PHYSICS • POLITICAL SCIENCE

The AA-T in Political Science for Transfer is designed to prepare students to transfer to a California State University (CSU) with the intent of earning a Bachelor of Arts degree in Political Science. Students who earn the AA-T in Political Science will know about various forms of government and governmental institutions, political parties, current public affairs, interest groups and international politics. They will understand the role of the citizen and the democratic process, and have knowledge of the history and evolution of various forms of government. Future careers include those in government service, public administration, international organizations or corporations, law, or teaching.

The following is required for the AA-T in Political Science 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 Curriculum (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:
- Discuss major theories and concepts of political science.
- Analyze political issues and formulate solutions.
- Participate knowledgeably as a U.S. citizen in civic-oriented environments.
- Demonstrate an understanding of U.S. and world politics.
- Comprehend enduring political thoughts and ideas throughout history.

Associate in Science Degree Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 141</td>
<td>General Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 142</td>
<td>General Chemistry II</td>
<td>5</td>
</tr>
<tr>
<td>GEOL 110</td>
<td>General Geology</td>
<td>5</td>
</tr>
<tr>
<td>MATH 180</td>
<td>Analytical Geometry and Calculus</td>
<td>5</td>
</tr>
<tr>
<td>MATH 280</td>
<td>Analytical Geometry and Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 281</td>
<td>Multivariable Calculus</td>
<td>4</td>
</tr>
<tr>
<td>PHYC 190</td>
<td>Mechanics and Heat</td>
<td>5</td>
</tr>
<tr>
<td>PHYC 200</td>
<td>Electricity and Magnetism</td>
<td>5</td>
</tr>
<tr>
<td>PHYC 210</td>
<td>Wave Motion and Modern Physics</td>
<td>5</td>
</tr>
</tbody>
</table>

Total Required 38
Plus General Education Requirements
Associate in Arts Degree Requirements:

Core Curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSC 121</td>
<td>Introduction to U.S. Government and Politics</td>
<td>3</td>
</tr>
</tbody>
</table>

List A: Select three of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSC 120</td>
<td>Introduction to Politics and Political Analysis</td>
<td>3</td>
</tr>
<tr>
<td>POSC 124</td>
<td>Introduction to Comparative Government and Politics</td>
<td>3</td>
</tr>
<tr>
<td>POSC 130</td>
<td>Introduction to International Relations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 160</td>
<td>Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td>PSY 215 Statistics for the Behavioral Sciences</td>
<td>4</td>
</tr>
</tbody>
</table>

List B: Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 108</td>
<td>Early American History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 100</td>
<td>Modern American History*</td>
<td>3</td>
</tr>
</tbody>
</table>

Any course from List A not selected above: 3-4 units

Total Units for Major (9-12 units may be double-counted with GE): 18-19 units

Total Transferable Elective Units: 2-5 units

Total Units for Degree: 60 units

*One course, HIST 108 or 109, meets CSU American Ideals requirement, along with Core of POSC 121.

Please note: SDSU accepts this degree for students transferring into Political Science B.A.

Program Learning Outcomes

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

- Demonstrate familiarity with the major concepts, theoretical perspectives, empirical findings, and historical trends in psychology.
- Understand and apply basic research methods in psychology, including research design, data analysis, and interpretation.
- Respect and use critical and creative thinking, skeptical inquiry, and, when possible, the scientific approach to solve problems related to behavior and mental processes.
- Understand and apply psychological principles to personal, social, and organizational issues.
- Weigh evidence, tolerate ambiguity, act ethically, and reflect other values that are the underpinnings of psychology as a discipline.

Associate in Arts Degree Requirements:

Core Curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 120</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 205</td>
<td>Research Methods in Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 215</td>
<td>Statistics for the Behavioral Sciences</td>
<td>4</td>
</tr>
</tbody>
</table>

List A: Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 130</td>
<td>General Biology I</td>
<td>3</td>
</tr>
<tr>
<td>PSY 140</td>
<td>Physiological Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

List B: Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 138</td>
<td>Social Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 150</td>
<td>Development Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 220</td>
<td>Learning</td>
<td>3</td>
</tr>
</tbody>
</table>

Any course not selected above: 3 units

Total Units for Major (12-15 units may be double-counted with GE): 19-22 units

Total Transferable Elective Units: 16-17 units

Total Units for Degree: 60 units

Please note: SDSU accepts this degree for students transferring into Psychology (Applied).

Psychology for Transfer (AA-T)

This degree program is designed to present students with a broad base understanding of human behavior so that they may explore human thought and behavior, and various methodologies. Students completing this degree may be interested in pursuing careers in research, counseling, teaching, and other behavioral science professions.

The following is required for the AA-T in Psychology 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. 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:

- Weigh evidence, tolerate ambiguity, act ethically, and reflect values that are the underpinnings of psychology as a discipline.
- Understand and apply basic research methods in psychology, including research design, data analysis, and interpretation.
- Respect and use critical and creative thinking, skeptical inquiry, and, when possible, the scientific approach to solve problems related to behavior and mental processes.
- Understand and apply psychological principles to personal, social, and organizational issues.
- Weigh evidence, tolerate ambiguity, act ethically, and reflect other values that are the underpinnings of psychology as a discipline.

Public Health Science for Transfer (AS-T)

The Associate in Science in Public Health Science for Transfer provides a broad exposure to the field of public health and related disciplines. Upon completion of this degree, students will be able to recognize effective strategies aimed at reducing threats to the health of our communities and the public at large. The program lays the foundation for student preparation in development, implementation, and evaluation of public health services in various settings and with diverse populations.

The following is required for the AS-T in Public Health Science for Transfer degree:

1. Minimum of 60 semester or 90 quarter CSU-transferable units;
2. California State University General Education Breadth pattern (CSU GE Breadth); or the Intersegmental General Education Transfer Curriculum (IGETC) pattern for the CSU;
3. Minimum of 18 semester or 27 quarter units in the major or area of emphasis;
4. Minimum grade point average (GPA) of 2.0;
5. Grade of “C” or better in all courses required for the major or area of emphasis.

Program Learning Outcomes

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

- Outline strategies for prevention, detection, and control of infectious and chronic disease.
- Describe the organization, financing, and delivery of various medical and population-based services in the United States health care system.
- Explain the role of Public Health in addressing the following issues: disparities among different populations, aging, injuries, obesity, control of emerging diseases and epidemics, and emergency preparedness.
- Analyze reliable public data sources to find statistical and epidemiologic data on incidence, prevalence, and trends in drug, tobacco and alcohol use.
- Review recent public health literature detailing ways that race, socioeconomic status and gender become embodied in disparate health outcomes.
- Analyze the contribution of environmental conditions to disparate health outcomes, using case studies.

Career Opportunities

Career opportunities in Public Health are varied, but consist primarily of "administration," teaching, "research," "program planning," "health promotion, outreach, and administrative assistance duties in the following contexts:

- Government agencies
- Private Volunteer agencies
- Hospitals
- Clinics
- International Relief programs
- Environmental Health programs
- Occupational Health programs

*Bachelor degree or higher recommended

Associate in Science for Transfer Degree Requirements:

Core Curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 130</td>
<td>General Biology I</td>
<td>3</td>
</tr>
<tr>
<td>BIO 131</td>
<td>General Biology I</td>
<td>Lab</td>
</tr>
<tr>
<td>BIO 140</td>
<td>Human Anatomy</td>
<td>5</td>
</tr>
<tr>
<td>BIO 141</td>
<td>Human Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 141L</td>
<td>Lab in Human Physiology</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>Fundamentals of Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>HED 120</td>
<td>Personal Health and Lifestyles</td>
<td>3</td>
</tr>
<tr>
<td>HED 201</td>
<td>Introduction to Public Health</td>
<td>3</td>
</tr>
<tr>
<td>MATH 160</td>
<td>Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>PSY 120</td>
<td>Introductory Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

List A: Select one course from the following: (3 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 120</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 121</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>HED 202</td>
<td>Health Professions and Organizations</td>
<td>3</td>
</tr>
<tr>
<td>HED 203</td>
<td>Substance Abuse and Public Health</td>
<td>3</td>
</tr>
<tr>
<td>HED 204</td>
<td>Health and Social Justice</td>
<td>3</td>
</tr>
<tr>
<td>PSY 134</td>
<td>Human Sexuality</td>
<td>3</td>
</tr>
<tr>
<td>SOC 120</td>
<td>Introductory Sociology</td>
<td>3</td>
</tr>
</tbody>
</table>
REAL ESTATE

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

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Differentiate and describe the essential elements and legal effects of various real estate documents, steps in an escrow, real estate financing and investment, and real estate valuation techniques.
• Differentiate and describe how to conduct oneself in a professional and ethical manner in any real estate office.

CAREER OPPORTUNITIES
Agent
• Appraiser
• Broker
• Builder/Developer
• Economist
• Escrow Officer/Trust Manager
• Investor
• Lender/Financial Institution
• Property Manager
• Salesperson
• Title Officer

* Bachelor Degree or higher required
† Office of Real Estate Appraisal License required

Associate in Science Degree Requirements:
Course Title Units
RE 190 Real Estate Principles 3
RE 191 Real Estate Practice 3
RE 192 Real Estate Finance 3
RE 193 Real Estate Legal Aspects 3
RE 194 Real Estate Appraisal 3

Select three of the following including one Accounting or Economics course:
BUS 110† Introduction to Business 3
BUS 120 Financial Accounting 4
ECON 110 Economic Issues and Policies 3
or
ECON 120 Principles of Macroeconomics 3
ECON 121 Principles of Microeconomics 3

RE 197 Real Estate Economics 3
RE 201 Real Estate Property Management 3
RE 250* Real Estate Internship 1-4
RE 294 Advanced Real Estate Appraisal 3
Elective (select one elective from below) 3

Electives:
BUS 125 Business Law: Legal Environment of Business 3
RE 125 Escrow Procedures I 3
RE 204 Real Estate Office Administration 3
RE 292 Mortgage Loan Broking and Lending 3

Total Required 22-26

Plus General Education Requirements

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

II. BROKER’S LICENSE
Program Learning Outcomes
Upon successful completion of this certificate, students will be able to:
• Differentiate and describe the essential elements and legal effects of various real estate documents, steps in an escrow, real estate financing and investment, and real estate valuation techniques.
• Differentiate and describe how to conduct oneself in a professional and ethical manner in any real estate office.

Students may satisfy the California State Education requirement for a Broker’s License by completing the following:
Course Title Units
RE 190 Real Estate Principles 3
RE 192 Real Estate Finance 3
RE 193 Real Estate Legal Aspects 3
RE 194 Real Estate Appraisal 3
One Accounting or Economics course 3-4

Electives: two of the following:
RE 190 Real Estate Principles 3
RE 201 Real Estate Property Management 3
BUS 125 Business Law: Legal Environment of Business 3

Total Required 21-22

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

SOCIAL WORK

This degree offers lower division preparation for students who wish to pursue a bachelor’s degree in social work. The program is designed to prepare students for transfer to four-year social work programs.

Program Learning Outcomes
Upon successful completion of this program, students will be able to:
• Apply critical thinking to the research, effects and planning in the field and practice of social work.
• Investigate social worker duties in dealing with a wide variety of difficult social situations including discrimination, oppression, maltreatment, poverty and injustice.
• Analyze various situations and determine the proper role of a social worker and the various factors influencing the situation.

CAREER OPPORTUNITIES
* Administration
* Child Welfare
Clinical:
* Counseling, Therapy
Community Organizations:
* Advocacy, Politics, Education
* Criminal Justice/Corrections
* Developmental Disabilities
* Gerontology
* Health Care
Occupational:
* Counseling
* Organizational Development
* Teaching

SOCIETY FOR TRANSFER (AA-T)

This degree program is designed to provide students with a broad understanding of human interaction, social processes, social structures, and tools of sociological investigation. Students completing this degree may be interested in pursuing careers in teaching, research, social work, and other behavioral science professions.

The following is required for the AA-T in Sociology 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:
• Evaluate society and make appropriate suggestions for improvement directed at social change.
• Analyze and interpret the diversity of social experience using a sociological perspective.
• Engage in critical thinking, analysis and problem solving about social issues.
• Employ theoretical and methodological approaches to sociological observations of everyday life.
• Evaluate the implications of multicultural diversity and global interdependence.
Associate in Arts Degree Requirements:

Core Curriculum:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 160: Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>PSY 138: Social Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 120: Introductory Sociology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 125: Marriage, Family, and Alternative Lifestyles</td>
<td>3</td>
</tr>
<tr>
<td>SOC 130: Contemporary Social Problems</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Major: 19

List A: Select one of the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 120: Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 120: Introductory Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units for Transfer degree: 60

Please note: SDSU accepts this degree for students transferring into Sociology B.A.

II. SPANISH

This degree program is designed to provide students with communicative skills in Spanish, as well as a greater understanding of Spanish culture and civilization. This degree prepares students to transfer to a California State University.

The following is required for the AA-T in Spanish 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 Breadth (CSU GE) or 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:

- Utilize more complex vocabulary and grammatical structures to communicate and discuss hypothetical situations dealing with nature, city, life, health and well-being, professions and occupations, the arts, current events, and politics.
- Utilize more complex vocabulary and grammatical structures to write about situations dealing with nature, city, life, health and well-being, professions and occupations, the arts, current events, and politics.
- Use language and vocabulary skills developed in class to read, analyze, and interpret authentic texts.

CAREER OPPORTUNITIES

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

Certificate of Achievement

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

SURVEYING

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

Program Learning Outcomes

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

- Measure angles and distances using electronic total stations and distance meters.
- Compile field data, adjusting for error from horizontal and vertical traverses.
- Create typical drawing title blocks accepted by local municipalities such as the City of San Diego.
- Calculate and plot contours and other features found on a topographic map.
- Plot easements using bearings, distances and curve information.
- Recognize and apply the appropriate vocabulary of boundary law in discussion, reading, and writing legal descriptions of boundary.
- Describe and solve advanced private and public land boundary problems.
- Solve introductory property boundaries using title reports and record maps.

CAREER OPPORTUNITIES

- Geodetic Surveyor
- Geophysical Prospecting Surveyor
- Instruments Surveyor Assistant
- Land Surveyor
- Marine Surveyor
- Mine Surveyor
- Oil-Well Directional Surveyor
Associate in Science Degree Requirements:

Course Title Units
---
CADD 115 Engineering Graphics 3
or
ENGR 100 Introduction to Engineering and Design 4
CADD 120 Introduction to Computer-Aided Drafting and Design 3
CADD 127 Survey Drafting Technology 3
MATH 170 Analytic Trigonometry 3
PHYS 110 Introductory Physics Principles 4
SURV 220 Boundary Control and Legal Surveying 4
SURV 240 Advanced Surveying 3
Total Required 27-28

Plus General Education Requirements

Certificate of Achievement

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

UNIVERSITY STUDIES

The Associate Degree in University Studies with an Area of Emphasis is intended to accommodate the differing requirements of a wide variety of transfer institutions and major options. Because admission and major preparation requirements vary at each four-year transfer institution, courses used to complete this degree should be selected with the assistance of a counselor. The completion of the University Studies Degree does not guarantee acceptance into either a baccalaureate major or a four-year institution.

REQUIREMENTS:

I. California State University (CSU) General Education Breadth

1. Complete CSU General Education Breadth (see Degree Requirements and Transfer Information section).
2. Earn a grade of "C" or better in 30 of the required 39 semester units of general education to include all courses in Area A and the Mathematical/Quantitative Reasoning courses in Area B.
3. Credit earned through external examinations, i.e., AP, will be applied towards general education in accordance with Cuyamaca College policies. Please note: This may be different than how the external exam is used on a CSU certification.
4. Complete a minimum of 18 units in an Area of Emphasis (listed below).
5. Complete a minimum of 60 degree applicable CSU transferable semester units.
6. Earn a cumulative GPA of 2.0 in all college coursework completed.
7. Meet Cuyamaca College residence requirements for graduation (see Admission Information).

AND

III. Area of Emphasis

A. Business and Economics
B. Communication and Language Arts
C. Humanities and Fine Arts
D. Science and Mathematics
E. Social and Behavioral Sciences

While 18 units are required in a specific area to meet the requirements of the degree, it is strongly recommended that as many lower division preparation for the major coursework as possible be completed at the community college prior to transfer. Some baccalaureate majors and four-year institutions require a higher GPA than is necessary for the associate degree. Courses that are not UC-transferable will not be used in the UC University Studies Area of Emphasis Degrees. Completion of the University Studies degree does not guarantee admission to a four-year institution.

A. Business and Economics

Courses for the Associate in Science in University Studies with an Emphasis in Business and Economics focus on the study of business transaction theory and practice, the operations and strategies of business decisions, legal concepts, and the place of business in the American and global economy as a whole. Students will apply mathematical and quantitative reasoning skills to the discipline’s methodologies, as well as evaluate and interpret basic economic principles and theories related to performance and specific economic sectors. Students completing this area may be interested in the following baccalaureate majors: accounting, business, economics, finance, information and decision systems, international business, management, and marketing. Students must complete a minimum of six units in Business, six units in Economics, and six units from the Electives category.

Program Learning Outcomes

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

• Demonstrate the ability to write effectively.
• Demonstrate the ability to locate relevant, reliable information and read it effectively.
• Organize thoughts and ideas in both oral and written format.
• Communicate effectively with diverse audiences.

B. Communication and Language Arts

Courses for the Associate in Science 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.

Program Learning Outcomes

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

• Organize thought and ideas in both oral and written format.
• Demonstrate the ability to write effectively.
• Use information technology to support effective decision making in the business environment.
• Communicate clearly in the business environment.

C. Humanities and Fine Arts

Courses for the Associate in Science 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, 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.

Program Learning Outcomes

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

• Analyze the principle elements of representative examples of art, architecture, literature, theater, philosophy, music, dance,
### Program Learning Outcomes

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

- Use mathematical skills to solve scientific and engineering problems.
- Employ the language, concepts and methods of the disciplines. Students must complete a minimum of six units in a respective category of human creativity.
- Analyze basic concepts of physical and biological science to evaluate scientific information and solve scientific problems.
- Apply knowledge of social and behavioral sciences theories and scientific methods in an assessment of real-world problems.
- Assess how social issues are influenced by geographical and historical processes.
- Evaluate the ways people act and interact in cultures, societies and social subgroups.
- Analyze an awareness of the historical and philosophical contexts of representative areas, movements, media, works, or styles of cultural and/or intellectual creativity.
- Demonstrate an understanding of social, political, and economic institutions within a historical perspective.
- Critically analyze and communicate meaning and intent in original works of art.

### Humanities

**ARAM 120, 121, 220**
**ARBC 120, 121, 122, 223, 220, 221, 254**
**ART 140, 141, 143, 145, 146, 149**
**ASL 120, 121, 140, 220, 221**
**CHIN 120, 121, 220, 221, 250, 251**
**ENGL 122, 201, 202, 207, 214, 217, 221, 222, 231, 232, 270, 271**
**FREN 120, 121, 220, 221**
**HIST 100, 101, 105, 106**
**HUM 110, 115, 116, 120, 140, 155**
**ITAL 120, 121, 220**
**NAKY 120, 121, 220**
**PHIL 110, 115, 117, 140, 160, 170**
**RELG 120, 130, 160, 170**
**SPAN 120, 121, 141, 145*, 220, 221, 250, 251**

### Fine Arts

**ART 100, 120, 124, 125, 129, 140, 141, 143, 144, 145, 146, 148*, 241, 242**
**MUS 110, 111, 114, 115, 116, 117**
**THTR 110, 120, 121**

### D. Science and Mathematics

Courses for the Associate in Science 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.

### Program Learning Outcomes

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

- Describe general principles of the political institutions and government of the United States.
- Demonstrate an understanding and appreciation of social, political, and economic institutions within a historical perspective.
- Evaluate the ways people act and interact in cultures, societies and social subgroups.
- Assess how social issues are influenced by geographical and historical processes.
- Apply knowledge of social and behavioral sciences theories and scientific methods in an assessment of real-world problems.

### Social Science

**ANTH 120, 140**
**BIO 134**
**ECON 110, 120, 121**
**GEOG 106, 130**
**HIST 100, 101, 105, 106, 108, 109, 118, 119, 122, 123, 130, 131, 132, 180, 181, 275, 276, 277**
**POSC 120, 121, 124, 130, 140**
**SOC 120, 125, 130**
**SPAN 145*”**

### Behavioral Science

**CD 115, 125, 131, 145**
**COMM 110, 124**
**HED 120, 158, 201, 203, 204, 251**
**PSY 120, 125, 134, 138, 140, 150, 170, 201*, 220**

*Courses not UC-transferable**
I. BACKFLOW AND 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:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWTR 101 Fundamentals of Water/Wastewater Technology</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 102 Calculations in Water/Wastewater Technology</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 104 Applied Hydraulics</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 120 Water Distribution Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 129 Backflow Tester Training</td>
<td>2</td>
</tr>
<tr>
<td>WWTR 282 Cross Connection Control Specialist</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 284 Cross Connection Control–Recycled Water</td>
<td>3</td>
</tr>
</tbody>
</table>

Select at least nine units from the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWTR 103 Introduction to Water Resources Management</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 105 Principles and Practices of Water Conservation</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 106 Introduction to Electrical and Instrumentation Processes</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 110 Laboratory Analysis for Water/Wastewater</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 115 Wastewater Reclamation and Reuse</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 132 Wastewater Collection Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 134 Mechanical Maintenance</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 290 Cooperative Work Experience</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Required: 29

Plus General Education Requirements

Certificate of Achievement

Students who complete only the major requirements and qualify for a Certificate in Backflow and 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 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 conceptual 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:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH 120 Fundamentals of Ornamental Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>OH 170 Plant Materials: Trees and Shrubs</td>
<td>3</td>
</tr>
<tr>
<td>OH 221 Landscape Construction: Irrigation and Carpentry</td>
<td>3</td>
</tr>
<tr>
<td>OH 250 Landscape Management</td>
<td>2</td>
</tr>
<tr>
<td>WWTR 101 Fundamentals of Water/Wastewater Technology</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 103 Introduction to Water Resources Management</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 105 Principles and Practices of Water Conservation</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 290 Cooperative Work Experience</td>
<td>2</td>
</tr>
</tbody>
</table>

Select two of the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWTR 102 Calculations in Water/Wastewater Technology</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 112 Basic Plant Operations: Water Treatment</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 114 Basic Plant Operations: Wastewater Treatment</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 130 Water Distribution Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 132 Wastewater Collection Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 280 Backflow Tester Training</td>
<td>2</td>
</tr>
<tr>
<td>WWTR 289 Cross Connection Control Specialist (Option)</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 284 Cross Connection Control Specialist–Recycled Water</td>
<td>3</td>
</tr>
</tbody>
</table>

Select two of the following:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH 102 Xeriscape: Water Conservation In the Landscape</td>
<td>2</td>
</tr>
<tr>
<td>OH 140 Soils</td>
<td>3</td>
</tr>
<tr>
<td>OH 174 Turf and Ground Cover Management</td>
<td>3</td>
</tr>
<tr>
<td>OH 220 Landscape Construction: Concrete and Masonry</td>
<td>3</td>
</tr>
<tr>
<td>OH 235 Principles of Landscape Irrigation</td>
<td>4</td>
</tr>
<tr>
<td>OH 238 Irrigation System Design</td>
<td>3</td>
</tr>
<tr>
<td>OH 255 Sustainable Urban Landscape Principles and Practices</td>
<td>2</td>
</tr>
</tbody>
</table>

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.

III. WATER TREATMENT PLANT OPERATOR
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:

- Define common terminology pertaining to collections system components, design, and management as well as inspection and quality control.
- Calculate the meter accuracy.
- Discuss the chemical, physical and management as well as inspection and quality control.
- 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 main 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:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWTR 101 Fundamentals of Water/Wastewater Technology</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 102 Calculations in Water/Wastewater Technology</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 104 Applicable Hydraulics</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 106 Introduction to Electrical and Instrumentation Processes</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 110 Laboratory Analysis for Water/Wastewater</td>
<td></td>
</tr>
<tr>
<td>WWTR 112 Basic Plant Operations: Water Treatment</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 117 Advanced Plant Operations: Water Treatment</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 118 Wastewater Reclamation and Reuse</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 130 Water Distribution Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 132 Wastewater Collection Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 134 Mechanical Maintenance</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 210 Introduction to Membrane Plant Operation</td>
<td></td>
</tr>
<tr>
<td>WWTR 270 Public Works Supervision</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 280 Backflow Tester Training</td>
<td>2</td>
</tr>
<tr>
<td>WWTR 282 Cross Connection Control Specialist</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 290 Cooperative Work Experience</td>
<td>2</td>
</tr>
<tr>
<td>WWTR 310 Principles and Practices of Water Conservation</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 320 Calculations in Water/Wastewater Technology</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 340 Applicable Hydraulics</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 360 Introduction to Electrical and Instrumentation Processes</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 380 Water Distribution Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 390 Advanced Plant Operations: Water Treatment</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 400 Advanced Plant Operations: Wastewater Treatment</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 410 Wastewater Reclamation and Reuse</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 215 Water Distribution Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 220 Water Distribution Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 230 Wastewater Collection Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 240 Cross Connection Control Specialist</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 250 Cooperative Work Experience</td>
<td>2</td>
</tr>
<tr>
<td>WWTR 260 Wastewater Collection Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 270 Public Works Supervision</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 280 Backflow Tester Training</td>
<td>2</td>
</tr>
<tr>
<td>WWTR 282 Cross Connection Control Specialist</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 284 Cross Connection Control Specialist</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 290 Cooperative Work Experience</td>
<td>2</td>
</tr>
<tr>
<td>WWTR 300 Principles and Practices of Water Conservation</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 310 Calculations in Water/Wastewater Technology</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 320 Applicable Hydraulics</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 340 Introduction to Electrical and Instrumentation Processes</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 360 Water Distribution Systems</td>
<td>3</td>
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<tr>
<td>WWTR 380 Advanced Plant Operations: Water Treatment</td>
<td>3</td>
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<tr>
<td>WWTR 400 Wastewater Reclamation and Reuse</td>
<td>3</td>
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<tr>
<td>WWTR 410 Water Distribution Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 420 Wastewater Collection Systems</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 430 Cross Connection Control Specialist</td>
<td>3</td>
</tr>
<tr>
<td>WWTR 440 Cooperative Work Experience</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Required 30

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

IV. WATER DISTRIBUTION SYSTEMS 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.

Select at least nine units from the following:

- WWTR 103 Introduction to Water Resources Management
- WWTR 105 Principles and Practices of Water Conservation
- WWTR 114 Basic Plant Operations: Wastewater Treatment
- WWTR 115 Wastewater Reclamation and Reuse
- WWTR 130 Water Distribution Systems
- WWTR 132 Wastewater Collection Systems
- WWTR 134 Mechanical Maintenance
- WWTR 268 Introduction to Membrane Plant Operation
- WWTR 270 Public Works Supervision
- WWTR 285 Backflow Tester Training
- WWTR 282 Cross Connection Control Specialist
- WWTR 290 Cooperative Work Experience

Total Required 21

Plus General Education Requirements

Select at least nine units from the following:

- WWTR 103 Introduction to Water Resources Management
- WWTR 105 Principles and Practices of Water Conservation
- WWTR 110 Laboratory Analysis for Water/Wastewater
- WWTR 112 Basic Plant Operations: Water Treatment
- WWTR 115 Wastewater Reclamation and Reuse
- WWTR 270 Public Works Supervision
- WWTR 280 Backflow Tester Training
- WWTR 282 Cross Connection Control Specialist
- WWTR 284 Cross Connection Control Specialist
- WWTR 290 Cooperative Work Experience

Total Required 21

Certificate of Achievement
Students who complete only the major requirements above qualify for a Certificate in Water Distribution Systems 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:

- Explain the required safe handling and storage of chlorine used in water distribution systems.
- Check and utilize water main 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.

Select at least nine units from the following:

- WWTR 103 Introduction to Water Resources Management
- WWTR 105 Principles and Practices of Water Conservation
- WWTR 104 Applicable Hydraulics
- WWTR 106 Introduction to Electrical and Instrumentation Processes
- WWTR 130 Water Distribution Systems
- WWTR 134 Mechanical Maintenance
- WWTR 265 Water Distribution Systems II

Total Required 21

Plus General Education Requirements

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

<table>
<thead>
<tr>
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<tr>
<td>WWTR 101 Fundamentals of Water/Wastewater Technology</td>
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<td>WWTR 102 Calculations in Water/Wastewater Technology</td>
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<td>WWTR 104 Applied Hydraulics</td>
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<tr>
<td>WWTR 106 Introduction to Electrical and Instrumentation Processes</td>
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<td>WWTR 132 Wastewater Collection Systems</td>
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<td>WWTR 134 Mechanical Maintenance</td>
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<td>WWTR 111 Basic Plant Operations: Water Treatment</td>
<td>3</td>
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<td>WWTR 120 Advanced Plant Operations: Wastewater Treatment</td>
<td>3</td>
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</table>

### 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 OPERATOR

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:

<table>
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<tbody>
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<td>WWTR 111 Basic Plant Operations: Water Treatment</td>
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<td>3</td>
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<tr>
<td><strong>Total Required</strong></td>
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</table>

### Certificate of Achievement

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