

- WTE 45 Vocational Math Skills for WWT/WTE (3)**
3 hours lecture
Note: Cross listed as WWT 45
Introduction to the basic mathematic skills used in water and wastewater calculations. Particular interest is given to industry-relevant problems and examples.
- WTE 100 Waterworks Distribution (3)**
3 hours lecture
Recommended preparation: WTE/WWT 45
Note: May be taken 4 times
Water utility system operations and maintenance. An introduction to the principles of pressure pipe systems and the hydraulics involved in their operation. Design, installation, operation, and maintenance of basic elements of water systems including pipes, pumps, valves, meters, and related hydraulic units. Operations and maintenance safety considerations emphasized. This course prepares students for the "American Water Works Association" Grade I and Grade II exams.
- WTE 105 Water Treatment Plant Operation I (3)**
3 hours lecture
Recommended preparation: WTE/WWT 45
Note: May be taken 4 times
Practical water quality control and treatment with emphasis given to sources of and quality characteristics of natural water, chemistry, public health protection, sanitary practices, and hydraulic principles. Particular attention will be given to basic water treatment plant process and operation. Will be helpful to those preparing for the Grade I and Grade II examination.
- WTE 110 Waterworks Mathematics (3)**
3 hours lecture
Recommended preparation: WTE/WWT 45
Note: Cross listed as WWT 110
Provides instruction in entry level to intermediate level mathematical calculations used in the operation and evaluation of conventional water and wastewater treatment processes. The course content has been developed to meet training requirements for entry to intermediate level certification (Grade I - III) for water treatment plant operators. Also, it will cover wastewater collection, treatment and disposal. Material will parallel some of the problems found on State Certification examination.
- WTE 120 Instrumentation and Controls (3)**
3 hours lecture
Prerequisite: WTE/WWT 110
Note: Cross listed as WWT 120; may be taken 4 times
Introduction to basic electrical theory. Applications and uses of water and wastewater control systems including switches, relays, alarms, motors, instrumentation and telemetering.
- WTE 125 Supervision (3)**
3 hours lecture
Note: Cross listed as WWT 125/PWM 125
Managerial aspects of public utilities including organizing organization, decision making, coordination, communication, and public relations. Personnel management including recruiting, training, evaluation, discipline, promotion, morale, and grievances. Safety programs and encouraging safe conditions, actions and attitudes.
- WTE 135 Backflow Prevention (3)**
2½ hours lecture-1½ hours laboratory
Note: Cross listed as WWT 135; may be taken 4 times
Concentrated training in recognition and abatement of cross connections in water supply and plumbing systems. Hands on backflow prevention device testing procedures for certification.
- WTE 138 Cross Connection Specialist (3)**
3 hours lecture
Recommended preparation: WTE/WWT 135
Note: Cross listed as WWT 138
The study of the various levels of administrative and technical procedures necessary to operate a cross connection control program. Students will obtain the knowledge to become certified as a "Cross Connection Control Specialist" under the provisions set forth by American Water Works Association.
- WTE 150 Water Quality Monitoring (3)**
2½ hours lecture-1½ hours laboratory
Recommended preparation: WWT/WTE 110
Regulatory requirements, proper sampling procedures, basic laboratory methods in order to monitor water quality for regulatory compliance or treatment plant operations.
- WTE 197 Water Technology Education Topics (.5-4)**
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture, laboratory, or lecture/laboratory may be scheduled by the department. Refer to Class Schedule.
Note: May be taken 4 times
Topics in Water Technology Education. See Class Schedule for specific topic offered. Course title will designate subject covered.
- WTE 205 Waterworks Distribution II (3)**
3 hours lecture
Recommended preparation: WTE 100 and WTE 110/WWT 110
Intermediate and advanced instruction in the field of water production, types of reservoirs, water lines, pumps, valves, and related appurtenances. Studies design, proper operation, and facilities repair of a public water system. Provides instruction in methods of record keeping and administrative responsibilities related to water systems. This course prepares students for the California Department of Health Services, Water Distribution Operator certification exams at levels D-3, D-4, and D-5 and the "American Water Works Association" certification exams for Grades II, III, and IV.
- WTE 210 Water Treatment Plant Operation II (3)**
3 hours lecture
Prerequisite: WTE 105 and WTE 110/WWT 110
Advanced water quality control and treatment with emphasis given to state regulations, EPA regulations, advanced mathematics and chemistry. Particular attention will be given to in depth examination of treatment plant processes and the enforcement of the Surface Water Treatment Rule, Total Coliform Rule, Interim Enhanced Surface Water Treatment Rule, Long Term 1 Enhanced Surface Water Treatment Rule, Long Term 2 Enhanced Surface Water Treatment Rule, and Disinfection/Disinfection by Product Rule. This course will be helpful to those preparing for Grade III and IV examinations.
- WTE 215 Motors and Pumps, Operation and Maintenance (3)**
3 hours lecture
Recommended preparation: WTE/WWT 110
Note: Cross listed as WWT 215; may be taken 4 times
Identification of problems encountered, causes of problems, corrective solutions, and repairs in the operation of pumps and motors. Implementation of maintenance programs including scheduling and recordkeeping.
- WTE 225 San Diego Regional Internship (4)**
12 hours laboratory
Note: Cross listed as WWT 225; Credit/No Credit grading only; may be taken 2 times
This class will provide students with the opportunity to gain work experience in San Diego County water and wastewater agencies through a formal internship. The one-year internship will provide experience in four primary areas: system operations, system maintenance, wastewater treatment and water treatment. Students must apply to the program and be accepted by a regional interview committee comprised of representatives from San Diego County water and wastewater agencies, Cuyamaca and Palomar Colleges and the San Diego County Water Authority.

Welding (WELD)

Contact the Trade and Industry Department for further information, (760) 744-1150, ext. 2545

Associate in Arts degree requirements, Certificate of Achievement requirements, and Certificate of Proficiency requirements are listed in Section 6 (green pages) of the catalog.

PROGRAMS OF STUDY

Entry-Level Gas Metal Arc Flux Cored Arc Welding

Provides the skills necessary for entry-level employment as a gas metal arc welder/flux cored arc welder.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
IT 100	Technical Mathematics	3
WELD 100	Welding I	3
WELD 120	Gas Metal Arc and Flux Cored Arc Welding	3
WELD 135	Print Reading for Welders	3
WELD 160	Metal Layout for Fabrication	3
TOTAL UNITS		15

Entry-Level Gas Tungsten Arc Welding

Provides the skills necessary for entry-level employment as a gas tungsten arc welder.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
IT 100	Technical Mathematics	3
WELD 100	Welding I	3
WELD 115	Gas Tungsten Arc Welding	3
WELD 135	Print Reading for Welders	3
WELD 160	Metal Layout for Fabrication	3
TOTAL UNITS		15

Entry-Level Shielded Metal Arc Welding

Provides the skills necessary for entry-level employment as a shielded metal arc welder.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
IT 100	Technical Mathematics	3
WELD 100	Welding I	3
WELD 135	Print Reading for Welders	3
WELD 160	Metal Layout for Fabrication	3
TOTAL UNITS		12

Welding Technology

Provides training for a career in the field of welding. Following the study of basic welding processes, the student may elect to concentrate in one or more of the basic welding processes and to prepare for the industrial certification test.

A.A. DEGREE MAJOR OR
CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
IT 100	Technical Mathematics	3
WELD 100	Welding I	3
WELD 110	Shielded Metal Arc Welding	3
WELD 115	Gas Tungsten Arc Welding	3
WELD 120	Gas Metal Arc and Flux Cored Arc Welding	3
WELD 160	Metal Layout for Fabrication	3
WELD 196	Special Problems in Welding	1,2,3
WELD 135	Print Reading for Welders	3
CE 100	Cooperative Education	1,2,3,4
TOTAL UNITS		23 - 28

COURSE OFFERINGS

Courses numbered under 50 are non-degree courses.
Courses numbered under 100 are not intended for transfer credit.

WELD 10L Shielded Metal Arc Welding Laboratory (3)

6 hours lecture/laboratory

Note: May be taken 4 times

Operation of arc welding machines with various electrodes in all positions of welding.

WELD 15L Gas Tungsten Arc Welding Laboratory (3)

6 hours lecture/laboratory

Note: May be taken 4 times

Operation of Gas Tungsten Arc Welding machines on carbon steel, stainless steel, and aluminum.

WELD 20L Semiautomatic Arc Welding Laboratory (3)

6 hours lecture/laboratory

Note: May be taken 4 times

Operation of Gas Metal Arc and Flux Cored Arc Welding machines on carbon steel.

WELD 100 Welding I (3)

2 hours lecture-4 hours laboratory

Note: May be taken 2 times

Transfer acceptability: CSU

Introduction to safe practices, setup, and operation of oxyfuel cutting and brazing, shielded metal arc welding, gas tungsten arc welding, flux core arc welding, and gas metal arc welding.

WELD 110 Shielded Metal Arc Welding (3)

2 hours lecture-4 hours laboratory

Note: May be taken 4 times

Transfer acceptability: CSU

Welding steel sheet metal, plate, tubing, and pipe. Carbon arc gouging on construction type steels.

WELD 115 Gas Tungsten Arc Welding (3)

6 hours lecture/laboratory

Note: May be taken 4 times

Transfer acceptability: CSU

Safe setup, operation, and maintenance of GTAW welding equipment. Welding stainless steel, carbon steel, and aluminum in the flat and horizontal position.

WELD 116 Advanced Gas Tungsten Arc Welding (3)

6 hours lecture/laboratory

Note: May be taken 4 times

Transfer acceptability: CSU

Safe setup, operation and maintenance of GTAW welding equipment. Welding stainless steel, carbon steel, aluminum, and other exotic metals in all positions according to building codes, military specifications, and aerospace standards.

WELD 120 Gas Metal Arc and Flux Cored Arc Welding (3)

2 hours lecture-4 hours laboratory

Note: May be taken 4 times

Transfer acceptability: CSU

Gas metal arc welding steel and aluminum sheet metal, plate and pipe with short arc and spray arc technique. Flux cored arc welding steel plate in flat, horizontal, and vertical positions.

WELD 135 Print Reading for Welders (3)

3 hours lecture

Line interpretation, sketching, bill of materials, structural shapes, welding symbols, joint types, weld types, and metric conversions.

WELD 140 Qualification of Welders (3)

2 hours lecture-4 hours laboratory

Prerequisite: WELD 101

Note: May be taken 4 times

This course is designed to train the students to be familiar with the provisions of the various welding standards and codes. Supervised training is provided so that students will be able to qualify for certification on any code or standard.

WELD 160 Metal Layout for Fabrication (3)

6 hours lecture/laboratory

Note: May be taken 4 times

This course provides students with knowledge of basic layout, fitup, fabrication, safe operation of shop equipment. Parallel line, radial line, and triangulation layout will be taught. Students will work from drawings or sketches to prepare, form, or cut multiple parts for assembly.

WELD 196 Special Problems in Welding (1,2,3)

3, 6, or 9 hours laboratory

Prerequisite: Completion of, or concurrent enrollment in, WELD 100**Note:** May be taken 4 times

This course is designed to aid the student in the enrichment of the area of concentration in welding and is of a research nature. Content to be determined by the need of the student under signed contract with the instructor.

Women's Studies

Contact the Behavioral Sciences Department for further information, (760) 744-1150, ext. 2330

Associate in Arts degree requirements, Certificate of Achievement requirements, and Certificate of Proficiency requirements are listed in Section 6 (green pages) of the catalog.

PROGRAM OF STUDY**Women's Studies**

This major offers the student an opportunity to study women and their contributions from a female perspective. It also provides intensive, interdisciplinary lower-division preparation necessary for pursuing advanced coursework in Women's Studies. Transfer students should consult the four-year college or university catalog for specific requirements.

A.A. DEGREE MAJOR

Program Requirements		Units
SOC 115	Introduction to Women's Studies	3
Electives (Select a minimum of 15 units)		
AIS 165	Native Women in the Americas	3
COMM 105	Human Values in the Mass Media	3
ENG 280	Women and Literature	3
HIST 130	Women in United States History	3
PSYC/SOC 125	Human Sexuality	3
PSYC 130	Psychology of Women	3
PSYC/SOC 145	Psychology and Sociology of Aging	3
TOTAL UNITS		18

Recommended Electives: ENG 100 and 202 with emphasis in Women's Studies issues.

Zoology (ZOO)

Contact the Life Sciences Department for further information, (760) 744-1150, ext. 2275

COURSE OFFERINGS**ZOO 100 General Zoology (4)**

3 hours lecture-3 hours laboratory

Note: Not open to students with prior credit in ZOO 101 or 101L**Transfer acceptability:** CSU; UC – No credit if taken after ZOO 101/101L; CAN BIOL 4

Principles of animal life and body organization. Structural and functional adaptations of major groups of the animal kingdom from protozoans through mammals. This is a general education course intended for non-science majors.

ZOO 101 Animal Kingdom (3)

3 hours lecture

Note: Not open to students with prior credit in ZOO 100**Transfer acceptability:** CSU; UC – No credit if taken after ZOO 100

Structural and functional adaptations of major groups of the animal kingdom from protozoans through mammals. ZOO 101L laboratory optional.

ZOO 101L Animal Kingdom Laboratory (1)

3 hours laboratory

Prerequisite: Completion of, or concurrent enrollment in, ZOO 101**Note:** Not open to students with prior credit in ZOO 100**Transfer acceptability:** CSU; UC – No credit for ZOO 101/101L if taken after 100

Investigations upon living and preserved specimens representative of the major groups of the animal kingdom. This is a general education course intended for non-science majors.

ZOO 115 Natural History of Animal Life (4)

3 hours lecture-3 hours laboratory

Note: Not open to students with prior credit in ZOO 116 or 116L**Transfer acceptability:** CSU; UC – ZOO 115, 116/116L combined: maximum credit, 4 units

Consideration of the natural history, adaptations, ecology, behavior, and distribution of animals with reference to major groups of both vertebrates and invertebrates. Weekend field trips are required.

ZOO 116 Natural History of Animal Life (Lecture) (3)

3 hours lecture

Note: Not open to students with prior credit in ZOO 115**Transfer acceptability:** CSU; UC – ZOO 115, 116/116L combined: maximum credit, 4 units

Consideration of the natural history, adaptations, ecology, behavior, and distribution of animals with reference to major groups of both invertebrates and vertebrates

ZOO 116L Natural History of Animal Life (Laboratory) (1)

3 hours laboratory

Prerequisite: Completion of, or concurrent enrollment in, ZOO 116**Note:** Not open to students with prior credit in ZOO 115**Transfer acceptability:** CSU; UC – ZOO 115, 116/116L combined: maximum credit, 4 units

The radiative adaptation of representative animals to various habitats and modes of life; field observation of major fauna of littoral, chaparral, desert, and mountain environments. Weekend field trips are required.

ZOO 120 Animal Behavior (3)

3 hours lecture

Transfer acceptability: CSU; UC

Biological basis of behavior including behavior genetics, operation of evolutionary processes on species typical behaviors, behavioral ontogeny, functional organization of nervous systems, animal senses, motivation including hormonal effects on drive, and biorhythms; behavioral ecology including social behavior and social living, reproductive behaviors, homing and migration, antipredatory defenses, feeding strategies, and communication.

ZOO 135 Marine Mammals: Biology and Ecology (3)

3 hours lecture

Note: Cross listed as BIOL 135**Transfer acceptability:** CSU; UC

Basic biology and ecology of marine mammals. Special emphasis on behavior, adaptations, and conservation.

ZOO 145 Introduction to Anatomy and Physiology (3)

3 hours lecture

Note: Not open to students with prior credit in ZOO 200, 203 and 205**Transfer acceptability:** CSU; UC – ZOO 145/145L and BIOL 106/106L or BIOL 105 combined: maximum credit, 4 units; UC – No credit for ZOO 145/145L if taken after ZOO 203, 205/205L, or 200