
Industrial Technology Associate in Science (A.S.) Degree

Item 1. Program Goals and Objectives

The mission of the Industrial Technology Program is to prepare students in basic machining, welding, and electrical processes for an entry level industrial technician position in the fields of manufacturing, agriculture, renewable energy, aerospace, electronics, or engineering technology. Safe and clean work habits consistent with OSHA and industry standards are practiced. The program can be completed at the IWV campus.

Upon completion of the program the student will be able to:

- Communicate general and technical information effectively in an industrial setting using technical drawings and sketches, oral and written skills, and basic computer skills.
- Apply mathematical concepts in real world industrial/technical situations.
- Demonstrate knowledge of basic electrical concepts.
- Produce practical and theoretical knowledge of tools and equipment, basic machining principles, and basic welding skills.
- Apply practical and theoretical knowledge of basic welding skills.

Fees are required for the two welding courses @\$40. each.

Item 2. Catalog Description

INDUSTRIAL TECHNOLOGY ASSOCIATE IN SCIENCE DEGREE is designed to prepare students for entry-level employment as an industrial technician. Basic machining, welding, and electrical processes are covered to prepare students for an entry level industrial technology position in the fields of manufacturing, agriculture, renewable energy, electronics, aerospace, or engineering technology. Safe and clean work habits consistent with OSHA and industry standards are practiced.

This degree is not specifically designed for transfer. Courses required for the Associate degree major at Cerro Coso Community College may not be the same as those required for a major at a four-year school. If you do plan to transfer, consult a counselor and visit www.assist.org to identify the courses needed for the major at your transfer school and to develop a plan that will best meet your goals.

You must complete a minimum of 60 units, including the courses listed in the major and general education requirements, with an overall GPA of 2.0 or better, and a grade of “A,” “B,” “C,” or

“P” in all courses for the major. A minimum of 12 units must be completed at Cerro Coso Community College.

Note: Some courses within the major have a required prerequisite. If you feel you have equivalent knowledge and skills to those included in the prerequisite course through professional experience, licensure or certification you have the opportunity to submit a Prerequisite Challenge to be reviewed by the faculty chair. For the Prerequisite Challenge to be considered you must submit documentation/verification to substantiate the basis for the challenge. Please see a counselor for more information about Prerequisite Challenge.

Requirements	Dept. Name/#	Name	Units	CSU -GE	IGETC	Sequence
Required Core (25 units)	CSCI C070	Computer Literacy	1			Yr 2, Fall
	DRFTC108	Reading Technical Drawings	3			Yr 2, Spring
	ENGL C070	Introductory Composition	4			Yr 1 Spring
	INDE C060	Mathematical Applications for the Trades	3			Yr 2 Fall
	INDE C115	Alternating and Direct Current Power	4			Yr 2 Spring
	MCTL C107	Tool and Equipment Operation	2			Yr 1 Fall
	MCTL C111	Beginning Machine Shop	3			Yr 2 Fall
	WELD C101	Oxyacetylene Welding	3			Yr 1 Fall
	WELD C200	Gas Metal Arc Welding	2			Yr 1 Spring

Required Major Total	25 units
Completion of CSU-GE Breadth or IGETC pattern	35 units
TOTAL UNITS	60 units

Proposed A.S. Sequence:
Year 1, Fall = 14 units
Year 1, Spring = 16 units
Year 2, Fall = 15 units
Year 2, Spring = 15 units
TOTAL UNITS: 60 units

Item 4. Master Planning

This is a revision of a previous Industrial Technology program that was heavy with extended emphases in multiple areas. This revision allows a streamlined program that is geared to the general industrial technician position, with a focus on getting students into available entry level positions in industry as soon as possible.

During advisory committee meetings employers were surveyed regarding internships and job placement. There continues to be jobs in this field for our graduating students.

We have an ongoing relationship with employers in aerospace, mining, manufacturing and renewable energy. We meet with advisory members each semester in order to review requirements, industry trends, curriculum currency and program needs.

Advisory members leading up to development of this program include: Terry Benham NAWCWD, Laura Hickle SSUSD, Damien Jacotin Burroughs H. S. , Gina Martin Searles Valley Minerals, Steve Wainscott Arcata, Will Zirger Searles Valley Minerals, Larry Zulkoski Arcata, Travis Dees Brookfield, Brook Denagan Mortenson (Solar), Dave Brown EDF Renewable (enXco), Ed Budney FloDesign, Ed Bullard Cal Wind Resources, Inc., Faudel Castanon Terra-Gen, Jim Chroder Terra-Gen Power (Construction), Eric Crajeski Windland, Inc, David David Thissen NextEra-SkyRiver, Kevin Davis AES Wind, Jeff Duff Air Streams, Adam Evantrou Well Said Communications, Dan Fredrickson Blattner, Curtis Golembeski Everpower, Robert Gurino Gamesa, Hallenbeck Vestas, Marlon Herrera Gexpro, Chris Kalbaugh GE, Dean Landon Terra-Gen, John Nemila Green Energy Maintenance, Peter Pawlowski FloDesign, Jon Powers Cal Wind Resources, Inc., Eric Preher NextEra Energy, David Shulgen Airstreams, Clayton Swan Blade Repair, Ed Taylor Terra-Gen Power (Construction, Rck & Sonya Torres RST Crane, Ray Becker Searles Mineral, Joe Dillishaw Searles Mineral, Don Duenas NAVFAC - Public Works, Kate George NAWC China Lake, Tish Gresham NAWC China Lake, John Haefele Searles Mineral, Arzel Hale Searles Mineral, Sean Halpin NAWC China Lake, Ken Hayes NAWC China Lake, Mark Henderson NAWC China Lake, Mark Pierce Sierra Sands Unified School District, Lloyd Plett NAWC China Lake, Ron Pruitt NAWC China Lake, Georg Pruitt Retired, Freddie Rivera NAVFAC - Public Works, Larry Sawyer Retired, John Tally NAWC China Lake, Ed Timmons NAWC China Lake, Eric Wooding NAWC China Lake, Cecil Yates NAVFAC - Public Works

Resources currently available are adequate as courses, with the exception of the MCTL C111 Beginning Machine shop, offered as parts of other programs for many years. Available resources include access to computers, textbooks, and videos as are already available for the Welding program and other departments contributing courses to this degree or certificate.

The Industrial Technology program review will be completed within five years of the offering of classes in the pathways determined by this revision.

Item 5. Enrollment and Completer Projections

The estimated completers per year is 15-20, based on the available seats in classes in the program.

The labor market analysis indicates that there are 48 jobs per year for this area; however, the college serves two apprenticeship programs (NAWC China Lake and Searles Valley Mineral) which collectively have approximately 10-15 students. These are incumbent workers returning to school to advance employment. These students need to be added to the EMSI report for jobs per year, so the total would be closer to 58-63 jobs.

(A) Enrollment Data

The program has not been offered as a program over the past two years. Many of the courses have been offered as part of other programs.

		<Year 1>		<Year 2>	
CB01: Course Department Number	CB02: Course Title	Annual # Sections	Annual Enrollment Total	Annual # Sections	Annual Enrollment Total
CSCI C070	Computer Literacy	6	120	6	120
DRFT C108	Reading Technical Drawings	2	50	1 (fall only as per pathway)	20
ENGL C070	Introductory Composition				
INDE C060 Change to INDE C060	Mathematical Applications for the Trades	2		2	
INDE C115	Alternating and Direct Current Power	Not offered		Not offered	
MCTL C107	Tool and Equipment Operation	2	41	1 (fall only as per pathway)	27
MCTL C111	Beginning Machine Shop	Not offered		Not offered	
WELD C101	Oxyacetylene Welding	5	100	5	100
WELD C200	Gas Metal Arc Welding	4	80	4	80

Item 6. Place of Program in Curriculum/Similar Programs

One course, CSCI C070 overlaps with the Business Office Technology program

Five courses, INDE C060 Mathematical Applications for the Trades, MCTL C107 Tool and Equipment Operation, DRFT C108 Reading Technical Drawings, WELD C101 Oxyacetylene Welding and WELD C200 Gas Metal Arc Welding overlap with the Welding Technology program.

This revision is an update to the existing Industrial Technician program currently on record at the state level.

Item 7. Similar Programs at Other Colleges in Service Area

There is no other community college program in our service area that can fill this need.

PROGRAM OF STUDY

CC Industrial Technology AS Degree Program

INDUSTRIAL TECHNOLOGY ASSOCIATE IN SCIENCE DEGREE is designed to prepare students for entry-level employment as an industrial technician. Basic machining, welding, and electrical processes are covered to prepare students for an entry level industrial technician position in the fields of manufacturing, agriculture, renewable energy, electronics, aerospace, or engineering technology. Safe and clean work habits consistent with OSHA and industry standards are practiced.

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Note: Some courses within the major have a required prerequisite. If you feel you have equivalent knowledge and skills to those included in the prerequisite course through professional experience, licensure or certification you have the opportunity to submit a Prerequisite Challenge to be reviewed by the faculty chair. For the Prerequisite Challenge to be considered you must submit documentation/verification to substantiate the basis for the challenge. Please see a counselor for more information about Prerequisite Challenge.

This program prepares students for careers in Industrial Technology

Entry level industrial technician in the fields of manufacturing, agriculture, renewable energy, electronics, and engineering technology.

Complete all of the following courses (21 units).

CSCI C070	Computer Literacy	1
DRFT C108	Reading Technical Drawings	3
INDE C060	Mathematical Applications For Trades	3
INDE C115	Alternating and Direct Current Power	4
MCTL C107	Tool and Equipment Operation	2
MCTL C111	Beginning Machine Shop	3
WELD C101	Oxyacetylene Welding	3
WELD C200	Gas Metal Arc Welding (GMAW)	2

A Total: 21

General Education Requirements

Complete general education requirements for a minimum of 60 total units.

Units
35

A Total: 35

Total Units

60

PID 769

Program Learning Outcomes

1 . Illustrate general and technical knowledge through the use of technical drawings, sketches, and basic computer skills.
Assessment: This will be assessed by an exam.

2 . Apply mathematical concepts in real world industrial/technical situations.
Assessment: This will be assessed and scored with an exam.

3 . Demonstrate knowledge of basic electrical concepts.
Assessment: This will be assessed and scored with an exam.

4 . Illustrate practical and theoretical knowledge of tools and equipment, basic machining principles, and basic welding skills.
Assessment: This will be assessed with an exam and a project and scored with a rubric.

5 . Apply practical and theoretical knowledge of basic welding skills.
Assessment: This will be assessed with an exam and a project and scored with a rubric.

Program Matrix

Courses	Program Learning Outcomes				
	A	B	C	D	E
CSCI C070	X				
DRFT C108	X				
INDE C060		X			
INDE C115			X		
MCTL C107				X	
MCTL C111					
WELD C101					X
WELD C200					X

Planning Summary

Program Cover

Recommended T.O.P. Code	0956.00
Units for Degree Major or Area of Emphasis	25
Total Units for Degree	60
Required Units-Certificate	25
Projected Annual Completers	20
Projected Net Annual Labor Demand (CTE)	48
Estimated FTE Faculty Workload	1.0
Number of New Faculty Positions	0
Est. Cost, New Equipment	0
Cost of New/Remodeled Facility	0

Est. Cost, Library Acquisitions 0

When will this program undergo review as part of college's Program Evaluation Plan? 70 = Fall 2016

Need

Enrollment and Completer Projections	Estimated completers is 15-20 per year
Place of Program in Curriculum/Similar Programs	This is a modification of the current Industrial Technology program
'Similar Programs at other colleges in service area	None. Cerro Coso Community College is in a remote area and no other college is offering this program in our service area.
Labor Market Information & Analysis (CTE only)	The labor market analysis indicates that there are 48 jobs per year for this area; however, the college serves two apprenticeship programs (NAWC China Lake and Searles Valley Mineral) which collectively have approximately 10-15 students. These are incumbent workers returning to school to advance employment. These students need to be added to the EMSI report for jobs per year, so the total would be closer to 58-63 jobs. There is no other community college programs in our service area that can fill this need.
Employer Survey (CTE only)	During advisory committee meetings employers were surveyed regarding internships and job placement. There continues to be jobs in this field for our graduating students.
Explanation of Employer Relationship (CTE Only)	We have an ongoing relationship with employers in aerospace, mining, manufacturing and renewable energy. We meet with them each semester in order to review requirements, industry trends, curriculum currency and program needs.
List of Members and Advisory Committee (CTE Only)	Terry Benham NAWCWD, Laura Hickle SSUSD, Damien Jacotin Burroughs H. S. , Gina Martin Searles Valley Minerals, Steve Wainscott Arcata, Will Zirger Searles Valley Minerals, Larry Zulkoski Arcata, Travis Dees Brookfield, Brook Denagan Mortenson (Solar), Dave Brown EDF Renewable (enXco), Ed Budney FloDesign, Ed Bullard Cal Wind Resources, Inc., Faudel Castanon Terra-Gen, Jim Chroder Terra-Gen Power (Construction), Eric Crajeski Windland, Inc, David David Thissen NextEra-SkyRiver, Kevin Davis AES Wind, Jeff Duff Air Streams, Adam Evantrov Well Said Communications, Dan Fredrickson Blattner, Curtis Golembeski Everpower, Robert Gurino Gamesa, Hallenbeck Vestas, Marlon Herrera Gexpro, Chris Kalbaugh GE, Dean Landon Terra-Gen, John Nemila Green Energy Maintinence, Peter Pawlowski FloDesign, Jon Powers Cal Wind Resources, Inc., Eric Preher NextEra Energy, David Shulgen Airstreams, Clayton Swan Blade Repair, Ed Taylor Terra-Gen Power (Construction, Rck & Sonya Torres RST Crane, Ray Becker Searles Mineral, Joe Dillishaw Searles Mineral, Don Duenas NAVFAC - Public Works, Kate George NAWC China Lake, Tish Gresham NAWC China Lake, John Haefele Searles Mineral, Arzel Hale Searles Mineral, Sean Halpin NAWC China Lake, Ken Hayes NAWC China Lake, Mark Henderson NAWC China Lake, Mark Pierce Sierra Sands Unified School District, Lloyd Plett NAWC China Lake, Ron Pruitt NAWC China Lake, Georg Pruitt Retired, Freddie Rivera NAVFAC - Public Works, Larry Sawyer Retired, John Tally NAWC China Lake, Ed Timmons NAWC China Lake, Eric Wooding NAWC China Lake, Cecil Yates NAVFAC - Public Works
Recommendations of Advisory Committee (CTE Only)	The advisory committee has provided input to this program revision and are in agreement with the direction of the program.

Adequate Resources

Library and/or Learning Resources Plan	The Cerro Coso Learning Resource Center offers industrial technology students resources such as books, ebooks, and education films workplace safety, tool and equipment operation, welding processes, blueprint reading, trade math, and other aspects of industrial technology. The Films on Demand database has several educational films that support the Industrial Technology program. The department is in discussion with the Librarian on new additions to flesh out the collections to include a more comprehensive collection of resources on industrial and trade related subjects.
Facilities and Equipment Plan	Facilities are currently being expanded and upgraded.
Financial Support Plan	The Annual Unit Plan cycle provides for financial support for instructional costs. All faculty, equipment, technology and supplies are budgeted on an annual basis. No increase is forecast.
Faculty Qualifications and Availability	Current full time and part time faculty can teach this program, however, more faculty will be requested. The Welding program shares courses and faculty.

Compliance

Based on model curriculum (if applicable)

NA

Licensing or Accreditation Standards

NA

Student Selection and Fees

WELD C101 \$40.00 fee WELD C200 \$40.00 fee The materials fee is to cover the cost of metal and consumables used for the projects that students can take home and is consistent with other welding courses in the program. Reference: Education Code section 76365 and title 5 regulations on instructional materials (§§ 59400-59408)

Conditions of Enrollment

Welding & Industrial Technology Advisory Meeting
April 23, 2013
Casey's Restaurant- Ridgecrest, CA

Attendees: Herman Foster, James O'Connor, Valerie Karnes, Angela Sellers, Jennifer Musick, Arzel Hale, John Haefele, Laura Hickle

Meeting began at 11:15am with welcome and attendee introductions

Advisory Committee discussion:

James O'Connor explained the purpose and expectations for an advisory committee

- Input from industry is needed for the continued growth of the program
- Importance of offering real world training to students
- Explained the C6 grant received by Cerro Coso from Department of Labor and Education
 - 11 colleges within the grant following 8 guiding principles (accelerated, block scheduling, cohort model, embedded remediation, support services)
 - Benefits of the C6 Grant:
 - Ability to fast track students to the workplace
 - Offer contextualized learning
 - Students receive a MSSC and AWS Welding certificate
 - Ability to transform the way we are educating students
 - College requirements is to meet 70% job placement for the completer
 - Review of current program

Review of current Industrial Technology handout/course sequence:

- Math for Trades course is being evaluated to be removed and replaced with a course that is specifically directed to the needs of the industry
 - Input received from Renewable Energy industry reflected the need for Electronics versus the Electricity
- The format was re-evaluated and changed to meet the various needs. Referencing Previous Course Sequence (page 10) and Proposed Course Sequence (page 11)

Identifying student cohorts for C6:

- Laura Hickle, SSUSD would like the ability to contact the HS students who completed
- SVM employees are selected currently by temporary employment agencies
 - There have been exceptions to the process when a possible employee arrives with education and experience
 - Current pay is \$12/hr-\$16/hr for entry level or \$18/hr-\$20/hr once they have been permanently selected
 - Have hired employees with defined criteria to complete and advanced pay at the time of completion
 - Maintenance department is approximately 1/3 of the staff
 - Potential openings are expected
 - Cannot employ lower than 6G welding level certification and layout
 - Students have to pass welding test procedures
 - Entry employees must have the ability to be a mechanic or welder that can be a mechanic
 - Currently RBS provides selection of employees

Welding & Industrial Technology Advisory Meeting

April 23, 2013

Casey's Restaurant- Ridgecrest, CA

Industry input:

- Searles Valley Mineral -
 - Agree the outline of proposed courses to be of value for their industry and interested in both circuits courses
 - Biggest challenge with the mechanical employees are the ability to pass the prerequisite to get to Technical Math Trades course
 - Safety course is important for employees

Additional updates:

- Laura Hickle would like for Herman and James to visit Jeff Prusa's High School class
 - Laura will contact with available days/times

Meeting concluded at 1:10pm