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Industrial Maintenance Technician

CTE NARRATIVE TEMPLATE for a (credit) Certificate of Achievement

ITEM1: Program Goals and Objectives

The Fresno City College Industrial Maintenance Technician program is designed to provide education and training in a variety of maintenance and repair technician skills for the food processing and manufacturing industry. The program consists of courses identified from existing disciplines in electronics, machining, welding, pneumatics/hydraulics, and mechanical power drives at FCC. These courses will form a new certificate program that will expose students to a common core of maintenance and operation trade skills and theory needed in the manufacturing industry. Successful completion of the program could lead to entry-level employment as a General Maintenance & Repair Technician, Machine Tender, and/or Maintenance Mechanic Supervisor. The **Industrial Maintenance Technician Certificate** is consistent with and supports the college's mission of providing quality, innovative educational programs and support services directed toward the enhancement of student success, lifelong learning and the economic, social, and cultural development of our students and region. These programs and services fulfill a primary mission of the college, career and technical education.

Student Learning Outcomes

1. Perform basic setups on the drill press, milling machines or engine lathes in a safe manner and to industry practices.

2. Demonstrate the ability to inspect fluid and pneumatic system components for proper operation and identify problems and the means to correct.

3. Given a SMAW and GMAW power source, students will be able to properly set up and adjust the machine to make a successful weld.

ITEM 2: Catalog Description

Industrial Maintenance Technician Certificate of Achievement

An industrial maintenance technician performs installation, repair and maintenance of commercial or industrial machinery in buildings, plants or factory setting, to ensure the machines' proper functionality.

ITEM 3: Program Requirements

Certificate of Achievement: Industrial Maintenance Technician

Dept. Name/#	Name	Units	Sequence
EST 51	Direct Current Fundamentals of Electronics	3	Yr 1 Fall
EST 53	Lab Safety Practices	2	Yr 1 Fall
EST 56B	Motor Controls	3	Yr 1 Spring
EST 58	Programmable Logic Controllers	3	Yr 1 Spring
AT 140	Introduction to Machine Shop	3	Yr 1 Fall
AT 150	Pneumatic & Hydraulic Systems	3	Yr 1 Fall
AT 160	Mechanical Power Drive Systems	3	Yr 1 Fall
WELD 2A	Introduction to Welding Technology	6	Yr 1 Spring
AT 19	Work Experience (Cooperative), Occupational	3	Yr 1 Spring

TOTAL UNITS: 29 units

Proposed Sequence:
Year 1, Fall = 14 units
Year 1, Spring = 15 units
TOTAL UNITS: 29

ITEM 4: Master Planning

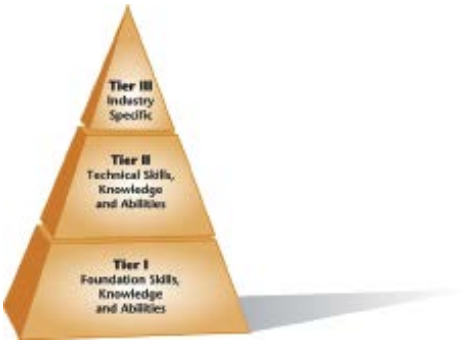
Food Processing and Manufacturing companies represent a major portion of employment in the Fresno area and the greater San Joaquin Valley. Currently, Fresno City College offers training in specific areas of machine tool technology, welding technology, electrical systems technology, pneumatic/hydraulic systems, and mechanical power drives. However, there is an absence of a broader, foundational platform of training that meets the food processing and manufacturing industry needs. As listed below, these skills have been referred to as Tier I and Tier II competencies in the recent Skills Standards for Food Manufacturers: Maintenance Mechanic (2013, Merced College, College of Sequoias, Washington State University Energy Program). This new focus on manufacturing and food processing technologies will offer an interdisciplinary approach for students to develop pathways of training for careers in these areas. In addition, this new program will offer more distinct directions and options for local manufacturers in the area that currently send their entry level employees to Fresno City College to be enrolled in classes across several traditional disciplines, without achieving a certificate or degree.

Pyramid of Competencies
The Pyramid of Competencies is a depiction of skill standards in three broad skill categories.

- **Tier I** represents the broadest level of competencies, and is the setof employability (SCANS) skills, knowledge, abilities and personal qualities required of all workers to

be successful in today's workplace. These are the universal skills that are needed to apply technical knowledge and tools effectively.

- **Tier II** represents technical skills, knowledge and abilities common to jobs within a cluster across all industries or industry sectors.
- **Tier III** represents industry-specific technical skills, knowledge and abilities that are unique to individual jobs or clusters and are the most prone to rapid change. For example, many workers need to upgrade their skills based on sudden market shifts.



The Fresno City College Applied Technology Division houses this instructional programming. Instructors will teach the program courses from faculty service areas in: electrical systems technology, manual machine shop, welding, pneumatic/hydraulic, and mechanical power drives. These instructional areas currently have of a variety of instructors. The program will rely on the rich history, expertise and capacity of the faculty from the electronics, machining, welding, and general maintenance disciplines. Presently, there is limited financial support in place to support the current program and this proposed new certificate, but funding is being sought for enhancement purposes.

Fresno City College faculty maintain an active relationship with local food manufacturing employers and associations, primarily located in Fresno County. As a group, the various college instructors through their respective areas meet with local employers on automation, electrical, machining and maintenance & repair interests. The proposed **Industrial Maintenance Technician Certificate** as a program, brings together the most common knowledge and skill needs required of the most frequently hired entry level employment opportunities such as: machine operators, line operators, general workers, and maintenance technicians, and therefore, appropriate to the objectives and conditions of higher education and community college education in California pursuant to Title 5 sections 55130(b) (6) and 55130(b) (7).

The Industrial Maintenance Technician Program will operate primarily out of the FCC Applied Technology Department: T-100, T-300, and T-600 Buildings. Open enrollment will be adhered to through observance of traditional college wide registration and enrollment practice available to all students seeking enrollment into college classes at Fresno City College – classes and program information will be published in the catalog and semester schedules for students seeking studies in Applied Technology. No additional student selection criteria are in place; this certificate complies with California Code of Regulations, Title 5, sections 55201 and 58106.

The FCC Applied Technology Division maintains active communication and employer relationship with local food processing and the manufacturing industry. These relationships span “physical processing plants” in fruit, nuts, dairy, poultry, vegetable dehydration, wineries, and a growing manufacturing community.

Input from local employers validate the need for the cross functional skills the Industrial Maintenance Technician Certificate aims to provide. FCC has a newly formed Industrial Maintenance Technician Advisory Committee [advisory minutes attached]. FCC has also collected information in support for the new Industrial Maintenance Technician Certificate from its participation in local and regional meetings that have included (1) the Merced College/College of Sequoias Food Manufacturing Skills Standard Initiative [report attached] and (2) the San Joaquin Valley Manufacturing Alliance. Finally, the FCC Applied Technology Division further evaluated a response to the need based on the analysis of local employer internal training programs presently enrolling their employees in FCC electrical, machining, welding, pneumatic/hydraulic, and mechanical power drive courses, each year.

Manufacturing Industry Advisory Committee:

Mark Erickson	Instructor	FCC Industrial Mechanic
Becky Barabe	Dean	FCC Applied Technology Division
Julie Lynes	Counselor	FCC Counseling
Brett Camacho	Dept. Chair, Welding Instructor	FCC Advance Fabrication Department
Robert Martinez	Dept. Chair, EST Instructor	FCC – Electrical Systems Technology Department
Jon Wiseman	Technical Sales Specialist	Electric Motor Shop
John Hodel	Lead Welder Technician	Industrial Electrical Company
Russel Lane	Electrician	Lane Electrical Contractor
Brannon Vidmar	Manufacturing Integrator	Anlin Windows
Robert Emrick	Machine Repair	Emrick Machinery
Mike Dillon	Service/Repair Manager	Zemark Corporation
Scott Salinas	Supply Chain Management	Westair Gases and Equipment

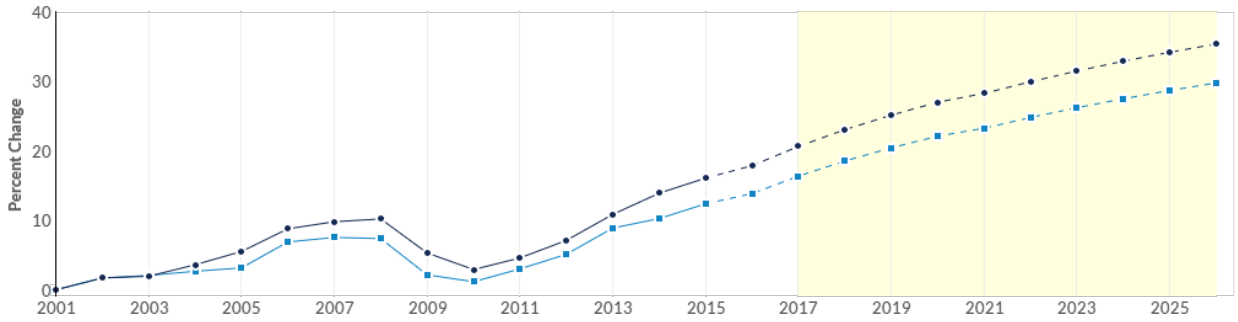
ITEM 5: Enrollment and Completer Projections

As a new program, the program estimates certificate enrollment will grow to 48 students in its program courses within the first two years. The college anticipates the current program will achieve 5 completers by its 2nd year and grow this completion rate through its fifth year of operation to 24 completers per year or semester (if additional instructors can be added to the program). Students will enroll into existing courses in electronics, machining, welding, pneumatic/hydraulic systems, and mechanical power drives.

		2014 - 2015		2015 - 2016	
Course	**Course Title**	**Annual Sections**	**Annual Enrollment**	**Annual Sections**	**Annual Enrollment**
EST 51	Direct Current Fundamentals of Electronics	7	185	6	137
EST 53	Lab Safety Practices	4	115	3	55
EST 56B	Motor Controls	2	58	2	44
EST 58	Programmable Logic Controllers	3	70	3	60
At 140	Introduction to Machine Shop				
AT 150	Pneumatic & Hydraulic Systems				
	Mechanical Power Drive Systems				
WELD 2A	Introduction to Welding Technology	6	155	6	138
AT 19	Work Experience (Cooperative), Occupational			1	15

Career Technical Education – Labor Review: Labor Market Information has been evaluated. The EMSI economic analysis of data includes local, sub-region, Central San Joaquin Valley region and state level data [study attached]. In all sets of data, trends have indicated a steady need for local and regional industrial maintenance professionals. Specifically, the data illustrated below is projecting, 1,543 jobs between 2017 and 2026 (an average of 171 jobs annually) a 12.2% growth in related industrial maintenance occupations. The employment range for the associated 6 occupations are listed between $16.29/hour. and $26.35/hour. Further analysis shows that in 2015, there were 502 openings with 369 completers in the region (from related programs). Therefore, 133 openings were not filled with completers in 2015. The analysis indicates a strong need for programs that can fill this need.

Regional Trends



	Region	2017 Jobs	2026 Jobs	Change	% Change
●	Region	12,644	14,187	1,543	12.2%
●	Fresno, CA	6,000	6,692	692	11.5%

ITEM 6: Place of Program in Curriculum/Similar Programs

The Industrial Maintenance Technician Certificate will provide an opportunity to offer a new certificate that responds to cross-functional technical skills required by the majority of local manufacturing employers for entry-level worker, operators and maintenance positions. At present, there is specific single focus skill development such as industrial electronics, welding, or manual machine shop. The gap these programs have is that they do not expose students to related trade skills and technology. These specialized programs are appropriate if the student has 3-5 years of related experience in industry. The Industrial Maintenance Technician Certificate is designed to target students lacking the experience in industry and seeking a broad set of skills to begin their careers as operators, technicians and entry-level maintenance personnel. The program is a better option for students seeking employment in the industry who have limited experience working in physical plants.

ITEM 7: Similar Programs at Other Colleges in Service Area

The Industrial Maintenance Technician Certificate is a new offering for high demand, high wage jobs. In the Fresno region, there are competing programs:

1. Fresno City College Career and Technology Center, Maintenance Mechanic Program.
2. Reedley College, Maintenance Mechanic Program.
3. Madera Center, Maintenance Mechanic Program.
4. Clovis Community

Private Schools in the Fresno area have Industrial Maintenance Technician programs:

1. Institute of Technology - Clovis
2. San Joaquin Valley College – Fresno