

## 3 Incumbent Worker Training

### 3.1 Introduction

While CPET has some incredible credit offerings for students desiring certifications and degrees, we were also envisioned to be more than just the credit side offering. If anything were to describe CPET's non-credit vision, it would be to say we were "built by industry, for industry". From the original concept to the final installation of our 35 labs, industry and SJC partnered together to create a training facility that no single company could build by themselves. But, now it's time to put those facilities to use to meet the ongoing training needs of industry.

This section of the document is intended to provide not only a list of "off-the-shelf" courses, but a resource list to help you design customized training that meets the unique needs of your company and even a particular site or department. Let's use the analogy of a salad or food bar in a restaurant. The cooks place before you a lot of choice of foods and individual ingredients, but it is your choice which of those items you put on your plate and in what quantity. Similarly, CPET has some great resources that we are laying before you: over \_\_ subject matter experts and 35 labs. You can choose to select prepared courses that are listed in section 2, or you can jump to section 3 to design your own customized training. So, let's get started.

### 3.2 Course Offerings

This section lists what we will call "off-the-shelf" offerings. This includes courses that are "linked" to credit side courses, NCCER offerings, and other short courses that have been offered previously and are, therefore, already developed. You can pick from the "off-the-shelf" offerings or use these as inspiration to design your own course.

#### 3.2.1 Linked Courses

#### Linked Courses



Classes labeled "linked" are paired with academic/credit classes. Enrollment in these sections is limited and must be approved on a space-available basis. Students in linked continuing education sections do not have to be admitted into the college and are TASP/THEA exempt.



A trainee in a "linked" course would attend class on the same days at the same times and in the same class with the for-credit student. The "linked" trainees would study the same material, be subject to the same class assessments, and receive a grade at the end of the class. However, a "linked" student would not receive academic credits but would receive continuing education credits (CEUs).

Academic courses for which "linked" options have typically been offered include: welding and NDT. However, enrollment can be considered for any academic course, but must be approved on a case-by-case basis depending on enrollment availability for that academic term. A list of courses that are typically offered in all the CPET credit programs can be found in section \_\_ of this document. However, not every course will be offered every college term. To determine which classes will be offered for a particular term, refer to the San Jacinto College Course Finder (<https://www.sanjac.edu/coursefinder>).

#### 3.2.2 NCCER Courses

The National Center Construction Education and Research (NCCER) "is a not-for-profit 501(c)(3) education foundation created in 1996 .... It was developed with the support of more than 125 construction CEOs and various association and academic leaders who united to revolutionize training for the construction industry. Sharing the common goal of developing a safe and

productive workforce, these companies created a standardized training and credentialing program for the industry...NCCER develops standardized construction and maintenance curriculum and assessments with portable credentials. These credentials are tracked through NCCER's Registry System that allows organizations and companies to track the qualifications of their craft professionals and/or check the qualifications of possible new hires. NCCER's Registry System also assists craft professionals by maintaining their records in a secure database. NCCER's workforce development process of accreditation, instructor certification, standardized curriculum, registry, assessment and certification is a key component in the industry's workforce development efforts." <https://www.nccer.org/about-us>

San Jacinto College CPET is an NCCER Accredited Training and Education Facility (ATEF) with facilities to offer several NCCER training courses including those listed below

**Detailed learning objectives of each course are provided in Appendix C of this document.**



- Core Curriculum – Introductory Craft Skills
- Managing Electrical Hazards
- Electrical Levels 1-4
- Instrumentation Levels 1-4
- Industrial Maintenance Electrical and Instrumentation Levels 1-4
- Millwright Levels 1-5
- Pipefitting Levels 1-4
- Welding Levels 1-4

### **NCCER Craft Training**

In order to earn industry recognized NCCER credentials, a trainee needs to:

1. **Complete training using NCCER Curriculum ("Knowledge Verified"):** When a trainee completes and scores a passing grade on the curriculum, the trainee is considered "knowledge verified".
2. **Pass an Assessment ("Performance Verified"):** Assessments evaluate the competence level of *experienced* workers by documenting knowledge and verifying skills. Assessments must be conducted at an NCCER Assessment Center. San Jacinto College CPET is not currently an NCCER Assessment Center.
3. **Confirm registration:** "NCCER credentials are tracked through NCCER's Registry System that allows organizations and companies to track the qualifications of their craft professionals and/or check the qualifications of possible new hires. NCCER's Registry System also assists craft professionals by maintaining their records in a secure database." <https://www.nccer.org/about-us>

**Knowledge Verified + Performance Verified = Certified**

### **3.2.3 Industry Partner Courses**

Periodically, CPET will host one of our industry training partners to conduct specialized training on their products. Examples are listed below. If you are interested in attending a local class conducted by one of these partners, contact the CPET staff for details.

- Emerson - DeltaV, Fisher valves, and Rosemount instruments.

- Siemens – Advanced analyzer
- Eaton – \_\_\_
- Others? (Puffer for RVs, .... Etc.)

### 3.2.4 **Introductory courses for non-experts**

Sometimes your employees need a basic introduction to an area in which they are not expected to become experts. For example:

- Your facility's operators were not hired to be maintenance workers; but, at some time, they might be expected to pull and replace a 2" 150# flanged gate valve. As such, they will need to know how to safely break a flange, identify the correct replacement valve, install the correct size and type of gasket, and properly reconnect the flange.
- Your engineers were not hired to be operators; yet engineers design and oversee projects that will be operated by operators. So, it is essential that the engineers understand your digital control system (DCS) and how your operators use this tool to safely and profitably operate your facility.
- Your operators are not expected to be instrument technicians, but maybe they might need to replace a small section of tubing on an instrument.
- Your engineers are not expected to be welders and inspectors, but they might need to specify the correct welding procedure and understand which inspection technique would be best for quality assurance on a completed welding project.

These are but a few examples of when you might need introductory level training for an employee in an area that is outside that employee's normal job function and expertise. To meet this need, we have created a catalog of "Introduction for a Non-expert" training courses. These courses are designed to provide targeted training to enable an employee to complete simple, introductory tasks quickly and safely as well as communicate effectively with the "experts".

### 3.2.5 **Design Your Own" – Customizing Training to Your Needs**

Your company's training needs are as unique as the people that work for you. You might have new hires with no prior training, or you might have highly experienced workers that need annual required safety training. We cannot possibly imagine every combination of training topics and durations that fits your needs. So, instead we choose to place all the choices before you and let you customize your training. Like patrons at a salad bar picking their food choices, you can browse all the learning outcomes for the credit side courses (Appendix \_\_\_) and pull out pieces that meet your needs. Alternatively, you can pull modules from the NCCER curriculum (Appendix \_\_\_) to build your customized courses. On the other hand, you might want to study the facility features (Appendix \_\_\_) as you might see lab resources that inspire a training idea not represented elsewhere in this document. What if you have a specific training need that you don't see represented in this document? Ask us about developing a customized course. Lastly, San Jacinto College has resources outside those available at CPET. If you have training needs that extend outside the CPET specialties, let us facilitate connecting you with other SJC resources that can meet the need. To develop custom training:

- Use the worksheet in Appendix \_\_\_ to collect your learning objectives. Use the current credit side offerings, NCCER curriculum, other short courses, or your own training plan to make a detailed list of the desired learning outcomes. An example worksheet is provided in Appendix \_\_\_.
- Use the cost sheet in Appendix \_\_\_ to calculate a rough estimate of the training cost based on training category, duration, and number of trainees.
- Contact a CPET Director to discuss details on implementing your course.

### 3.3 Currently Available Short Courses

The table below provides a list of “off-the-shelf” courses that can be selected as-is or used as inspiration to create your own custom course.

Subject		Course Title
Foundations	1	Basic Chemistry
	2	Basic Physics
	3	Electricity Principles
	4	Industrial Math – Level 1
	5	Industrial Math – Level 2
	6	Basic Tools (Hand and Power)
	7	Precision Measurement Instruments (Starrett Certified – 32 hrs.)
	8	Advanced Measurement Instruments (Starrett Certified – 35 hrs.)
Process Equipment (Stationary)	1	Process Diagrams (P&IDs, PFDs)
	2	Pipe for Non-Pipefitters
	3	Valves
	4	Pressure Relieving Devices and Systems
	5	Pressure Vessels
	6	Tanks
	7	Towers
	8	Heat Exchangers, Cooling Towers
	9	Boilers, Furnaces
	10	Process Instrumentation for Operators
Process Equipment (Non-Stationary)	1	Motors and Motor Controllers
	2	Pumps
	3	Compressors
	4	Turbines
	5	Seals
	6	Bearings
	7	Vibration Analysis
Process Systems	1	Water Systems (Fire, Utility, Waste, Cooling)
	2	Gas Systems (Instrument Air, Nitrogen, Natural Gas, Fuel Gas)
	3	Steam Generation and Distribution
	4	Reactor Systems
	5	Distillation Systems
	6	Auxiliary Systems
Process Operations	1	Emerson Delta V - Introduction
	2	Introduction to Quality Principles
	3	CPET Glycol Unit Operations
	4	Process Operations Troubleshooting
Instrumentation	1	Introduction to Programmable Logic Controllers
	2	Programmable Logic Controllers - Advanced
	3	Physics of Instrumentation
	4	Instrumentation Hands-on Practicum (for Instrumentation Techs – maybe prep for NCCER performance assessment exams?)
Electrical	1	National Electric Code Overview
	2	Reading/Interpreting Blueprints, Ladder Diagrams
	3	Introduction to Electrical Calculations

	4	Electrical Safety NFPA-70E
	5	Electrical Systems Overview
	6	Motors, Controls, and Drivers
	7	Troubleshooting Electrical Systems
	8	Electrical Hands-On Practicum (for Electrical Techs – maybe prep for NCCER performance assessment exams?)
Environmental, Health, and Safety	1	Regulatory Agencies and Their Responsibilities
	2	Governmental Regulations (Overview of Federal, State, and Local Regulations)
	3	Process Safety (Includes: PPE, fall protection, LOTO, JSAs, Hot work permits, etc. – should these all be separate courses?)
	4	Risk Management
	5	Industrial Safety and Engineering Fundamentals
	6	Introduction to Environmental Science
	7	Introduction to Process Safety Management (PSM)
	8	Hazardous Waste Operations and Emergency Response (HAZWOPER) - Part 1
	9	Hazardous Waste Operations and Emergency Response (HAZWOPER) - Part 2
	10	Hazardous Waste Operations and Emergency Response (HAZWOPER) - Refresher
	11	Accident Prevention, Inspection, and Investigation
Inspection Technologies	1	Material Science for Non-Metallurgists
	2	Inspection for Non-Inspectors
Crafts, Maintenance	1	Millwrighting
	2	Welding for Non-Welders

### 3.4 Suggested Combination Packages

While every company does have unique training needs, there are also details that are common to all petrochemical industries. As such, we have provided some ideas of combination packages that combine some of the basics into a standard offering.

#### 3.4.1 New Operator Training, Strike Preparation Training

- Foundations: Courses 1,2,4,6
- Process Equipment – Stationary: Courses 1-10
- Process Equipment – Non-Stationary: Courses 1-4
- Process Systems: Courses 1-6
- Process Operations: Courses 1-4
- Electrical: Course 4
- EHS: Courses 1-3, 7-9

#### 3.4.2 Experienced Operator Refresher, Incidental Maintenance

- Foundations: Course 5
- Process Operations: Courses 1-4
- Electrical: Course 4
- EHS: Courses 3-7, 10, 11
- Inspection Technologies: Courses 1

#### 3.4.3 Engineer “Day in the Life of an Operator”

- Process Operations: Courses 1, 3

#### 3.4.4 Engineer “Boot Camp”

- Foundations: Basic Tools

- Process Equipment – Stationary: All courses (compressed)
- Process Equipment – Non-stationary: all courses (compressed)
- Inspection Technologies: all courses (compressed)
- Welding: Welding for Non-Welders

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