

Appendix A

WORK PROCESS SCHEDULE AND RELATED INSTRUCTION OUTLINE



HILLYARD TECHNICAL CENTER/SAINT JOSEPH SCHOOL DISTRICT

For the Occupation of:
ELECTRONICS TECHNICIAN

O*NET-SOC CODE: 17-3023.00
RAPIDS CODE: 0169CB

Developed in Cooperation with:
U.S. DEPARTMENT OF LABOR
OFFICE OF APPRENTICESHIP



Appendix A

**WORK PROCESS SCHEDULE
HILLYARD TECHNICAL CENTER/ST. JOSEPH SCHOOL DISTRICT
ELECTRONICS TECHNICIAN
O*NET-SOC CODE: 17-3023.00 RAPIDS CODE: 0169CB**

This schedule is attached to and a part of these Standards for the above identified occupation.

1. APPRENTICESHIP APPROACH

Time-based Competency-based Hybrid

2. TERM OF APPRENTICESHIP

The term of the apprenticeship is a minimum OJL attainment of **2,000-8,000 hours**, supplemented by the minimum required **288** hours of related instruction.

3. RATIO OF APPRENTICES TO JOURNEYWORKERS

The apprentice to journeyworker ratio is: 1 Apprentice to 1 Journeyworker.

4. APPRENTICE WAGE SCHEDULE

Apprentices shall be paid a progressively increasing schedule of wages based on either a percentage or a dollar amount of the current hourly journeyworker wage rate as determined by employers/advisory committee.

Wages will never be less than the minimum wage as determined by the State of Missouri

5. PROBATIONARY PERIOD

Every applicant selected for apprenticeship will serve a probationary period of approximately 90 days . Students readiness for continuation in the program will be assessed at spring conferences. Input will be collected from the student's home school, technical instructor and employer.



6. SELECTION PROCEDURES

Students engage in a rigorous selection process for apprenticeship positions. Students apply online to indicate interest in preapprenticeship. Students are selected for preapprenticeship based on recommendation by the sending school counselor and their technical instructor.

The Apprenticeship Coordinator promotes diversity in the program by making it accessible to all who are interested. Students receive support in composing a resume, preparing for interviews, researching job opportunities and companies, completing OSHA training and workplace communication. Students who follow through and complete these tasks dutifully will be presented to employers as candidates for hire. Those who procure employment become registered apprentices with our program upon confirmation with the sending school and parent/guardian.

All Registered Youth Apprentices are celebrated at a spring signing ceremony and become the next cohort for our program.



**WORK PROCESS SCHEDULE
HILLYARD TECHNICAL CENTER/ST. JOSEPH SCHOOL DISTRICT**

ELECTRONICS TECHNICIAN	
Job Description: Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, adjust, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions.	
RAPIDS Code: 0169CB	O*NET Code: 17-3023.00
Estimated Program Length: 2,000-8,000 hours	
Apprenticeship Type: <input checked="" type="checkbox"/> Competency-Based <input type="checkbox"/> Time-Based <input type="checkbox"/> Hybrid	

Suggested On-the-Job Learning Outline

Apprenticeship Competencies – Technical

The below on-the-job-learning (OJL) work process competencies are intended as a guide. It need not be followed in any particular sequence, and it is understood that some adjustments may be necessary in the hours allotted for different work experience. In all cases, the apprentice is to receive sufficient experience to make them fully competent and use good workmanship in all work processes, which are a part of the trade. In addition, the apprentice shall be fully instructed in safety and OSHA requirements.

Ratings are:

- No Exposure- Apprentice has not been exposed to this skill/concept yet.
- Not Mastered- Apprentice requires instruction and close supervision.
- Requires Supervision- Apprentice can complete task with limited or periodic supervision.
- Proficient- Can work independently without supervision



Competencies	No Exposure	Not Mastered	Requires Supervision	Proficient
A. Modify, maintain, or repair electronics equipment or systems to ensure proper functioning.				
B. Replace defective components or parts, using hand tools and precision instruments.				
C. Assemble, test, or maintain circuitry or electronic components, according to engineering instructions, technical manuals, or knowledge of electronics, using hand or power tools.				
D. Install or maintain electrical control systems, industrial automation systems, or electrical equipment, including control circuits, variable speed drives, or programmable logic controllers.				



Competencies	No Exposure	Not Mastered	Requires Supervision	Proficient
E. Set up and operate specialized or standard test equipment to diagnose, test, or analyze the performance of electronic components, assemblies, or systems.				
F. Assemble, test, or maintain circuitry or electronic components, according to engineering instructions, technical manuals, or knowledge of electronics, using hand or power tools.				
G. Read blueprints, wiring diagrams, schematic drawings, or engineering instructions for assembling electronics units, applying knowledge of electronic theory and components.				
H. Install or maintain electrical control systems, industrial automation systems, or electrical equipment, including control circuits, variable speed drives, or programmable logic controllers.				
I. Identify and resolve equipment malfunctions, working with manufacturers or field representatives as necessary to procure replacement parts.				
J. Identify and resolve equipment malfunctions, working with manufacturers or field representatives as necessary to procure replacement parts.				
K. Identify and resolve equipment malfunctions, working with manufacturers or field representatives as necessary to procure replacement parts.				
L. Design or modify engineering schematics for electrical transmission and distribution systems or for electrical installation in residential, commercial, or industrial buildings, using computer-aided design (CAD) software.				
M. Assemble electrical systems or prototypes, using hand tools or measuring instruments.				



N. Assemble, test, or maintain circuitry or electronic components, according to engineering instructions, technical manuals, or knowledge of electronics, using hand or power tools.				
O. Construct and evaluate electrical components for consumer electronics applications such as fuel cells for consumer electronic devices, power saving devices for computers or televisions, or energy efficient power chargers.				
P. Review electrical engineering plans to ensure adherence to design specifications and compliance with applicable electrical codes and standards.				
Q. Review existing electrical engineering criteria to identify necessary revisions, deletions, or amendments to outdated material.				
R. Interpret test information to resolve design-related problems.				
S. Maintain system logs or manuals to document testing or operation of equipment.				
T. Compile and maintain records documenting engineering schematics, installed equipment, installation or operational problems, resources used, repairs, or corrective action performed.				
U. Procure parts and maintain inventory and related documentation.				
V. Select electronics equipment, components, or systems to meet functional specifications.				
W. Calculate design specifications or cost, material, and resource estimates, and prepare project schedules and budgets.				
X. Research equipment or component needs, sources, competitive prices, delivery times, or ongoing operational costs.				
Y. Supervise the installation or operation of electronic equipment or systems.				



Z. Compile and maintain records documenting engineering schematics, installed equipment, installation or operational problems, resources used, repairs, or corrective action performed.				
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Advanced competencies				
Competencies	No Exposure	Not Mastered	Requires Supervision	Proficient
AA. Calculate design specifications or cost, material, and resource estimates, and prepare project schedules and budgets.				
BB. Calculate design specifications or cost, material, and resource estimates, and prepare project schedules and budgets.				
CC. Educate equipment operators on the proper use of equipment.				
DD. Modify electrical prototypes, parts, assemblies, or systems to correct functional deviations.				
EE. Participate in the development or testing of electrical aspects of new green technologies, such as lighting, optical data storage devices, and energy efficient televisions.				
FF. Integrate software or hardware components, using computer, microprocessor, or control architecture.				
GG. Purchase materials, equipment, or other resources.				
HH. Participate in training or continuing education activities to stay abreast of engineering or industry advances.				
II. Provide user applications or engineering support or recommendations for new or existing equipment with regard to installation, upgrades, or enhancements.				
JJ. Specify, coordinate, or conduct quality control or quality assurance programs or procedures.				
KK. Produce electronics drawings or other graphics representing industrial control, instrumentation, sensors, or analog or digital telecommunications networks, using computer-aided design (CAD) software.				
LL. Conduct statistical studies to analyze or compare production costs for sustainable or nonsustainable designs.				
MM. Review, develop, or prepare maintenance standards.				



<p>NN. Construct and evaluate electrical components for consumer electronics applications such as fuel cells for consumer electronic devices, power saving devices for computers or televisions, or energy efficient power chargers.</p>				
<p>OO. Participate in the development or testing of electrical aspects of new green technologies, such as lighting, optical data storage devices, and energy efficient televisions.</p>				

Behavioral Competencies	4- Exceeds Target	3- Achieves Target	2- Meets Some Targets	1- Not Meeting Targets
<p>Manufacturing Basics: Student shows a basic understanding of Manufacturing and desire to learn the industry.</p>				
<p>Communication: Student is receptive to learning and communicates effectively with coworkers.</p>				
<p>Enthusiasm & Attitude: Student shows a positive mental attitude and enthusiasm toward learning.</p>				
<p>Leadership & Teamwork: Student contributes ideas and collaborates with coworkers to accomplish goals.</p>				
<p>Networking: Student communicates well within the workplace in order to further productivity.</p>				
<p>Problem Solving & Critical Thinking: Student identifies solutions to most problems and knows when and who to ask for help.</p>				



Professionalism: Exhibits appropriate behavior on the job and is productive.				
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Date of evaluation: _____ Company Name: _____

Apprentice Name: _____ Apprentice Signature: _____

Mentor Name: _____ Mentor Signature: _____

Date turned in: _____ Instructor Signature: _____



RELATED INSTRUCTION OUTLINE
ELECTRONICS TECHNICIAN
O*NET-SOC CODE: 17-3023.00 RAPIDS CODE: 0169CB

Please provide the Related Instruction Outline to include a list of the anticipated courses, the learning objectives, and the estimated number of hours that each course will last.

Related Technical Instruction provided by Hillyard Technical Center, Saint Joseph, Missouri <https://hillyardtech.sjsd.k12.mo.us/>

Each apprentice **will receive annual compliance training in anti-harassment** in accordance with Paragraph 30.3, CFR. 29.30. Additional resources can be found at <https://www.apprenticeship.gov/eo/sponsors/prevent-harassment>

Course Descriptions:

Electronics Technology

Instructor: Shawn Moser

This program is for students who want to get an entry level position as an Electronics Technician and it will satisfy the **the minimum 288 hours of Related Technical Instruction (RTI)**.

Skills

(Daily Objectives)

Unit 1 Principles of Electricity

- 1.Students must know how to work safely in an industrial work environment.
- 2.Students must know how to safely solder.
- 3.Students must know how to work safely with power supplies.

Unit 2 Principles of Electricity (Unit DC NIDA)

1. Students will know how to work with DC circuits safely.
2. Students will know how to work with AC circuits safely.



DJI Factory Training

1. Students will be able to safely operate trainer Phantom drones from a hobbyist FAA guidelines.

Unit 3 Principles of Electronics

1. Assembly of multimeter

Unit 4 Principles of Electricity

1. Students will know how to use a multimeter/amp meter and oscilloscope.
2. Students will calibrate a multimeter that they have assembled.

Unit 5/6 Principles of Electricity

1. Students will learn to work with series circuits
2. Students will learn to work with parallel circuits
3. Students will work with series and parallel circuits

Unit AC in NIDA

1. Students will be able to break down and isolate basic circuit problems in a professional and competent method.
2. Students will be able to read and evaluate proper AC power applications. Students will also scope and analyze AC power.

Unit 1 PLC Writing

1. Students will write a PLC program using I/O that will connect to a robot.

Unit 1 PLC Flow Charting

1. Students will make a flow chart of the basic operation of a PLC using start, end, process, and decision symbols.

Unit 5 PLC Flow Charting Advanced

1. Students will flow start a PLC process that will use start, end, decision, alternate process, cycle, and subroutine accurately.

Unit 1 Proper Applications for Writing Robotic Programs.



1. Students will write a program for robotics that will wait for products to arrive before it starts.

Unit 5 Advanced Robotic Wiring

1. Students will wire the I/O of a robot to complete a robotic process.

FANUC Certification

1. Students will learn FANUC factory certification protocol and observe proper robotic theory and application in all robotic writing processes.

2. Students will demonstrate examples of FANUC writing frames and macros.

Unit 1 Industrial Electronics

1. Students will install a programmable logic controlled (PLC) with a start, stop, and jog circuit.

2. Students will test and repair a motor control systems with a start, stop, and jog circuit.

Unit 5 Industrial Electronics

1. Students will write a program in robotics and PLC's that will be connected to each other through software.