

Student Name: _____

Date: _____

PROGRAM COMPETENCY PROFILE FOR CAREER TECHNICAL EDUCATION
Career Cluster: Manufacturing

Program Name: Industrial Electronics Technology/Technician CIP: 470105

Effective 8/09

National Standard: Electronics Skill Standards: Oklahoma Department of Career Technology Education

Competencies (statement that provides the overview and defines the instructional area) Student will:	Knowledge, Content and Skills (what a student needs to know and be able to do and upon which they will be assessed) Student will:	<u>NH Common Core State Standards</u> – Aligned <ul style="list-style-type: none"> • English/Language Arts/Literacy: E • Mathematics: M • Science: S • Art: A 	Rating Scale -Sample Performance Assessments (Performance tasks the student needs to demonstrate in order to be rated proficient in meeting the competency) Student will:				
Understand safe workplace practices, use of tools, materials, equipment, and codes and regulations of the trade in order to prepare to enter the 21st century work force.	1. Practice proper electrical safety.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
	1	2	3	4			
	2. Demonstrate proper tool usage and techniques.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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	3. Operate equipment safely and use approved personal protective devices.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
1	2	3	4				
4. Demonstrate adherence to posted warning signs and abnormalities.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4	
1	2	3	4				
5. Demonstrate and practice safety in general work areas. AAI 8. Health, Safety, and Environment: Explain the health and safety laws and practices affecting the employee, the surrounding community, and the environment in this industry.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4	
1	2	3	4				
Understand and use fundamental industrial electrical concepts to be able to adapt to changing workforce.	6. Describe the four basic electrical quantities: voltage, current, ohmage and wattage.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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	7. Use Ohm’s law and other mathematical methods to analyze series and parallel circuits. AAI 4. Technical and Production Skills: Identify specific production and technical skills required for this industry. AAI 5. Underlying Principles of Technology: Explain through discussion the technological systems used within this industry.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
1	2	3	4				
	8. Explain basic atomic concept demonstrating electrons, protons and neutron theory.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
1	2	3	4				
Understand established symbols, standards, conventions and terminology common to the electronics industry in order to meet ISO standards.	9. Match engineering notation order of magnitude to the standard prefix and symbol.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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	10. Match the name for electrical and magnetic quantities and units to the correct System International (SI) symbol. AAI 4. Technical and Production Skills: Identify specific production and technical skills required for this industry.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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	11. Convert engineering notation units.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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	12. Diagram using industry symbols.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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	13. Classify and relate electronic terminology.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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Understand electrical components and circuits in order to be able to build and repair current and future electronic circuits.	14. Identify and select components based on color codes and numerical identification.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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	15. Follow guidelines for attaching instrumentation for measuring voltage, current and resistance.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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	16. Explain required parts of a basic circuit.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
1	2	3	4				
	17. Troubleshoot “open,” “short,” and reverse polarity.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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	18. Verify stated value to measured values for both fixed and variable components, i.e., resistors, capacitors.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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Understand characteristics of AC/DC voltage and current sources to ensure life safety and protection of equipment.	19. Differentiate source versus load.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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	20. Predict and verify the output of sources in series/parallel circuits.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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21. Interpret multiple methods of generating current and voltage.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4	
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Understand proper use of instrumentation to be able to make accurate reading and documentations of data.	22. Select proper instrumentation for measuring electrical quantities. AAI 4. Technical and Production Skills: Identify specific production and technical skills required for this industry.		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
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	23. Demonstrate proper usage of analog and digital instrumentation.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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	24. Apply computer aided software for simulation.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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Understand the concepts, methods and procedures in common systems so that they can adapt to a variety of work place requirements.	25. Identify the methods and procedures common to one or more system(s) (i.e., robotics, computer hardware, radio receiver design, amateur radio, fiber optics, telephonic). AAI 5. Underlying Principles of Technology: Explain through discussion the technological systems used within this industry.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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	26. Analyze and apply techniques to solving systemic problems. AAI 4. Technical and Production Skills: Identify specific production and technical skills required for this industry.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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	27. Evaluate the system’s effectiveness.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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	28. Analyze and resolve system failures.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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Understand the fundamental concepts of entrepreneurship and how entrepreneurship influences the economy.	29. Demonstrate and apply skills for programming electronic devices. 30. Discuss and assess venture creation possibilities and identify the steps in planning the venture. AAI 1. Planning: Explain the key elements of a long-term plan for a successful company. AAI 2. Management: Discuss the different forms of management and ownership within the industry. AAI 3. Finance: Explain the key components of financial management of a company.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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	31. Identify the resources needed for venture startup and operation.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table>	1	2	3	4
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	32. Discuss the options in planning the venture’s future (growth, development, demise). AAI 6. Labor Issues: Explain the employees’ and employers’ rights and responsibilities in this industry. AAI 7. Community Issues: Discuss the ways a company can impact its community and the ways a community can impact a company.		<table border="1" style="display: inline-table;"> <tr> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">2</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">4</td> </tr> </table>	1	2	3	4
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	33. Identify and discuss the traits and behaviors of an entrepreneur (leadership, personal assessment, personal management).		<table border="1" style="display: inline-table;"> <tr> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">2</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">4</td> </tr> </table>	1	2	3	4
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Understand the importance of personal growth and leadership to enhance career success.	34. Demonstrate personal growth, community leadership, democratic principles and social responsibility by participating in activities/events offered through student organizations.		<table border="1" style="display: inline-table;"> <tr> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">2</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">4</td> </tr> </table>	1	2	3	4
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Understand the necessary employability skills in order to achieve success in today’s workplace.	35. Decision-Making & Problem-Solving: Demonstrate and apply good decision-making and problem-solving skills by outlining issues in situations/problems and determining, collecting, and organizing information needed in order to formulate a solution.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table> For Example: - create an outline - create a troubleshooting log - make class presentation - develop and test strategies or options that work - provide examples of the strategies or options tested or tried - compare and analyze pros and cons of identified strategies or options - through teamwork, arrive at a decision or determine a solution that is well suited to the task - independently arrive at a decision or determine a solution that is well suited to the task - communicate in a clear format how the solution was formed - justify or describe how and why a particular solution option was chosen	1	2	3	4
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	36. Self –Management: Demonstrate and apply self-management skills by adhering to regulations, being responsible, and following through on commitments. AAI 9. Personal Work Habits: Explain the work habits an employer looks for in an employee in this industry.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table> For Example: - have a written test on applicable policies and procedures - assess student orientation knowledge through instructor observations and written unit test - review student handbook - adhere to regulations in school, classroom, and everyday settings - build trust by being consistent, dependable, and verbally positive with others - ask questions and listen to others - keep track of assignments and/or responsibilities - have work done on time - respond positively to constructive feedback - show respect for others and their points of view - set individual goals and document progress toward achieving those goals - take initiative to pursue learning - adapt as necessary to create a positive outcome for self and others - advocate appropriately for himself/herself	1	2	3	4
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	37. Communication Skills: Demonstrate and apply effective communication skills: verbal, written, visual, and listening.		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">2</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">4</td> </tr> </table> <p>For Example:</p> <ul style="list-style-type: none"> - be given a work order that contains written instructions of a specific job and complete the work order - create a power point presentation - participate in a debate - perform mock interviews - develop a topic - include details to support a main point - use appropriate grammar and sentence structure - organize writing and/or presentation materials - use constructive feedback to improve skill - participate in discussion and conversation by listening, entering in, taking turns, responding to others' remarks, asking questions, summarizing and closing, as appropriate to the given context - use varied vocabulary for clarity and effectiveness - support his/her ideas in a public forum using the appropriate visual/audio aides - select and use the appropriate media and method(s) to communicate the subject effectively - adapt writing, speaking, and/or visual presentations effectively to a particular audience - act on or respond appropriately to verbal and non-verbal cues from the audience 	1	2	3	4
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	38. Ability to Work with Others: Demonstrate and apply the necessary skills in order to work effectively with others.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table> <p>For Example:</p> <ul style="list-style-type: none"> - role play a situation in which there is a conflict which must be resolved - compose a list of what she/he believes to be the most common problems within that profession after reviewing appropriate work ethics standards - conduct an interview with a manager and share report with classmates - demonstrate knowledge of individual strengths he/she brings to a group - demonstrate knowledge of and respect for cultural and individual differences - demonstrate beginning skills in conflict management by outlining the issues involved and others' points of view - demonstrate knowledge of the possible roles and responsibilities that individuals assume while working with others - demonstrate knowledge of group skills: listening, brainstorming, clarifying information, showing initiative, acknowledging contributions, defining group tasks, and responding positively to constructive feedback - demonstrate increasing skills in conflict management by brainstorming a variety of solutions and their possible outcomes - apply his/her individual strengths to enhance a group's performance - assume responsibilities within a group - demonstrate the use of group skills in a way that enhances a group's performance - demonstrate skills in conflict management by describing, justifying, and applying a resolution process, and reflecting on the outcome 	1	2	3	4
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	39. Information Use - Research, Analysis, Technology: Demonstrate and apply the use of information through research, analysis, and technology.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table> For Example: - do a research project and develop a presentation for the class - keep a daily notebook - show use of a plan for gathering information - gather information from a variety of sources, using a variety of technologies - use sources that are current and appropriate to the topic - evaluate sources for correct and trustworthy information - document sources of information appropriately - demonstrate and apply the skills in using software applications (MS Office) - use a filing/organization system for information, such as notebook, disk, etc. - justify the use of a particular organizational system for a particular product - demonstrate effective communication skills (written, oral, listening) - effectively present a thesis, supporting evidence, and a conclusion using a variety of media	1	2	3	4
1	2	3	4				

Key: Rating Scale: 1 NO EXPOSURE; 2 = NOVICE (Information was covered in class, but student cannot demonstrate skill or knowledge without significant supervision); 3 = PROFICIENT (Student regularly demonstrates the knowledge or skill); 4= MASTERY (Student demonstrates successful completion of this skill numerous times without supervision.)

PROGRAM COMPETENCY PROFILE FOR CAREER TECHNICAL EDUCATION

Career Cluster: Manufacturing

Program Name: Industrial Electronics Technology/Technician CIP: 470105

Effective 8/09

National Standard: Electronics Skill Standards: Oklahoma Department of Career Technology Education

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	40. Mathematical Concepts: Demonstrate mathematical and computation skills as applied to real world situations.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">1</td> <td style="width: 25%;">2</td> <td style="width: 25%;">3</td> <td style="width: 25%;">4</td> </tr> </table> <p>For Example:</p> <ul style="list-style-type: none"> - keep a log of all possible uses of mathematics noticed throughout the class/lab/worksite - compute accurately, applying addition, subtraction, multiplication, and division on real numbers, fractions, percents, and decimals - collect, interpret, organize and display relevant data for solving a mathematics problem - translate real world problems into mathematical representations - express and present mathematical ideas clearly in everyday written and oral language - express in written and oral language how mathematics connects to other contexts outside the mathematics classroom - use basic numerical concepts such as whole numbers and percentages in practical situations; make reasonable estimates of arithmetic results without a calculator; and use tables, graphs, diagrams, and charts to obtain or convey quantitative information - approach practical problems by choosing appropriately from a variety of mathematical techniques; use quantitative data to construct logical explanations for real world situations; express mathematical ideas and concepts orally and in writing; and understand the role of chance in the occurrence and prediction of events 	1	2	3	4
1	2	3	4				

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	41. General Safety: Demonstrate and apply safe practices and procedures in the workplace.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table> For Example: - develop scenarios of hazards and accidents using publications and the internet - be observed by teacher - take written quizzes/written tests - demonstrate knowledge of safety and sanitation practices and procedures - identify and report hazardous conditions and safe working procedures - use personal protective equipment and clothing	1	2	3	4
1	2	3	4				
	42. Career Development: Demonstrate personal/career development skills by completing a career plan.		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table> For Example: - complete a self-awareness inventory - develop a career portfolio - use a career software, such as Choices, to measure their aptitudes and abilities for particular careers - use available resources (college catalogs and websites) to research information about postsecondary educational opportunities - select a career in the field and outline educational and skill requirements, expected job growth, and salaries - review with teacher software printout to assess their aptitudes and abilities - make appropriate choices in pursuit of postsecondary education or training and/or direct entry into the world of work - plan a senior experiential project to review and evaluate a variety of career choices	1	2	3	4
1	2	3	4				

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