# Introduction to Manufacturing Course No. 13001 Credit: 0.5

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| --- | --- | --- | --- |
| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes:Automation Engineer Pathway (15.0406)

Course Description: An **introductory level** course that uses programming and coding, business concepts, marketing, and leadership principles. The course includes precision and accuracy measuring, progresses to design and 3D printing, hand and power tools, electricity and fiber optics, programming and coding, business concepts, marketing, and provides students with the knowledge and skills to invent or innovate a product of their own.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Problem Solving

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Students ask relevant questions and utilize mathematical skills to solve complex problems. |  |
| 1.2 | Employ conflict resolution strategies acquired from team-building activities to address challenges, promoting adaptability and resilience in problem-solving. |  |
| 1.3 | Analyze and combine information effectively to solve intricate problems, integrating mathematical concepts and data organization for technical solutions. |  |

## Benchmark 2: Technical Knowledge

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Students exhibit practical skills in joining materials, creating circuits, and working with fasteners. |  |
| 2.2 | Students demonstrate proficiency in handling electronics, circuits, and communication systems. |  |
| 2.3 | Students test and apply technical concepts like fiber optics and Raspberry Pi functionality. |  |
| 2.4 | Students exhibit practical skills in joining materials, creating circuits, and working with fasteners. |  |
| 2.5 | Students showcase innovation in designing and building functional circuits and products. |  |

## Benchmark 3: Communication Skills

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Students effectively communicate and collaborate with peers from diverse backgrounds |  |
| 3.2 | Students encourage diverse idea generation and inclusivity when working on projects. |  |
| 3.3 | Students exhibit leadership qualities by guiding and supporting team members in achieving goals. |  |
| 3.4 | Students adapt to changes and effectively address situations when things don't go as planned. |  |
| 3.5 | Students respect and value differences among classmates while working in a team setting. |  |
| 3.6 | Engage in diverse communication methods, including technical communication through Morse Code. |  |

## Benchmark 4: Technical Skill Development

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Students exhibit inventive thinking and apply creative methods to construct new products and prototypes. |  |
| 4.2 | Students analyze and employ principles of precision and accuracy to ensure and enhance quality control in manufacturing operations. |  |
| 4.3 | Students proficiently utilize the product design process to critically develop and construct functional prototypes, evaluating the effectiveness of the applied methodologies. |  |
| 4.4 | Students adeptly employ software tools and 3D printers to ideate, design, and fabricate new products, showcasing competence in utilizing technological resources. |  |
| 4.5 | Students discern and assess the variances between waterfall and agile methods employed for mass production in the manufacturing domain, showcasing critical analysis in production methodologies. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

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