

Computer Integrated Manufacturing – Unit 4 – Process Flow Chart

Unit Focus

Computer-integrated manufacturing (CIM) is an introduction to the use of computer techniques to integrate manufacturing activities. These activities encompass all functions necessary to translate customer needs into a final product. CIM usually starts with the development of a product concept then product design and specification with the final step revolving around automating the manufacturing process.

This culminating unit will serve as the final exam. It will require students to apply what they learned in each of the three modules(rapid prototyping, CNC Mill manufacturing and automation) in creating solution to a manufacturing problem.

The PBA will have students conceptualize and collectively design an automation process of cleaning a cell phone.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
<p>Connecticut Goals and Standards <i>Manufacturing: 12</i></p> <ul style="list-style-type: none"> Apply a variety of manufacturing techniques and processes to create a usable product <i>MAN.03.03</i> <p><i>Pre-Engineering Technology: 12</i></p> <ul style="list-style-type: none"> Describe and utilize the steps in the design process. <i>ENG.02.01</i> Test a prototype. <i>ENG.02.09</i> Use all tools and equipment safely <i>ENG.06.03</i> Describe and demonstrate the process for using CAD in a design solution. <i>ENG.07.04</i> <p>CSTA: Computer Science Standards (2017-) <i>CSTA: 9-10</i></p> <ul style="list-style-type: none"> Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests. <i>3A-AP-13</i> Systematically design and develop programs for broad audiences by incorporating feedback from users. <i>3A-AP-19</i> <p>ITEEA - Standards for Technological Literacy <i>Technological Literacy: K-12</i></p>	<p>T1 Demonstrate professionalism through exhibiting attentiveness, growing from feedback, and adhering to industry standards (safety). T2 Develop a product/solution that adheres to key parameters (e.g., cost, timeline, restrictions, available resources and audience). T3 Communicate effectively based on purpose, task, and audience using appropriate vocabulary.</p>	
	Meaning	
	Understanding(s)	Essential Question(s)
	<p>U1 The less time a part takes to make, the more potential profit is available. U2 Jigs and fixtures are essential in maintaining consistency and quality control. U3 During the design and development process, a flowchart or pseudocode are used to plan and depict the process flow for an entire system and all of its subsystems.</p>	<p>Q1 How do I plan and organize a manufacturing process?</p>
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
<p>K1 The differences between jigs and fixtures. K2 Flow Process Chart</p>	<p>S1 Create a flowchart or pseudocode to perform a task. S2 Design a manufacturing system with consideration to</p>	

Stage 1: Desired Results - Key Understandings

- Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving. *10*
- Students will develop the abilities to use and maintain technological products and systems. *12*
- Students will develop an understanding of and be able to select and use manufacturing technologies. *19*

Student Growth and Development 21st Century Capacities Matrix

Collaboration/Communication

- Collective Intelligence: Students will be able to work respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective. *MM.3.1*
- Product Creation: Students will be able to effectively use a medium to communicate important information (findings, ideas, feelings, issues, etc.) for a given purpose. *MM.3.2*

Self-Direction

- Perseverance: Students will be able to identify problem(s) and use appropriate strategies to continue toward a desired goal. *MM.4.2*

time and cost to produce a product.
S3 Design and create a jig and/or fixture to help increase the efficiency of a process.