

## Syllabus

# PLATO Course Principles of Manufacturing, Semester A

## Course Overview

PLATO Course Principles of Manufacturing, Semester A, is a one-semester course intended to help you familiarize yourself with the evolution of manufacturing and describes manufacturing processes and systems. This course has twelve lessons organized into three units. Each unit has a Unit Activity, and each lesson contains one or more Lesson Activities.

This course will cover the history and evolution of manufacturing, manufacturing processes, engineering design, and production systems.

You will submit the Unit Activity documents to your teacher, and you will grade your work in the Lesson Activities by comparing them with given sample responses. The Unit Activities (submitted to the teacher) and the Lesson Activities (self-checked) are the major components of this course. There are other assessment components, namely the mastery test questions that feature along with the lesson; the pre- and post-test questions that come at the beginning and end of the unit, respectively; and an end-of-semester test. All of these tests are a combination of simple multiple-choice questions and technology enhanced (TE) questions.

## Course Goals

By the end of this course, you will be able to do the following:

- Describe the evolution of technology and advancements in the field of Engineering.
- Describe information technology skills required to use computers and software/programs effectively.
- Explain the evolution of manufacturing and describe various manufacturing processes, systems, and concepts.
- Describe different materials used in manufacturing and their applications.
- Explain different manufacturing processes and describe their use of various tools, equipment, machines, and materials.
- Describe the evolution of measuring instruments and types of precision instruments.
- Apply basic mathematical formulae used in manufacturing and analyze engineering drawings.

- Explain computer-aided design and manufacturing.
- Explain and compare mass, lean, and agile production.
- Describe how to set goals and manage time and resources effectively.
- Explain the importance of critical-thinking and problem-solving skills and describe the fundamental steps in analyzing and resolving problems.
- Explain the importance of creativity and resourcefulness and describe various methods for evaluating problems and generating creative solutions.

## Prerequisite Skills

PLATO Course Principles of Manufacturing, Semester A has the following prerequisites:

- basic math knowledge
- ability to visualize and apply creativity and innovation
- familiarity with the writing process and following guidelines
- basic computer skills
- ability to structure and process information

## General Skills

To participate in this course, you should be able to do the following:

- Perform basic operations on a computer.
- Perform online research using various search engines and library databases.
- Communicate through email and participate in discussion boards.

*For a complete list of general skills that are required for participation in online courses, refer to the Prerequisites section of the Plato Student Orientation document, found at the beginning of this course.*

## Credit Value

PLATO Course Principles of Manufacturing, Semester A is a 0.5-credit course.

## Course Materials

- notebook
- computer with Internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft Excel or equivalent
- Microsoft PowerPoint or equivalent

## Course Pacing Guide

This course description and pacing guide is intended to help you stay on schedule with your work. Note that your course teacher may modify the schedule to meet the specific needs of your class.

## Course Components and Grading Rubric

The table gives a breakdown of the weight for each component in the course. Weight represents the percentage of the total score coming from each activity.

Course Components	Count	Weight
<b>Pretest.</b> <i>Pretests are optional assessments, typically designed for credit recovery use. If a student shows mastery of a lesson's objective, the student may be automatically exempted from that lesson in the upcoming unit. Typically, teachers do not choose to employ exemptive pretests for first-time credit courses. Pretests are not included as a component of the student's final grade.</i>	3	0%
<b>Module.</b> <i>Each module in this course contains an interactive tutorial and an associated mastery test. Tutorials may include one or more Lesson Activities that constitute tasks associated with the tutorial. The module score comes from a student's score on the mastery test.</i>	12	20%
<b>Discussion.</b> <i>Online discussions allow for higher-order thinking about terminal objectives. An online threaded discussion mirrors the educational experience of a classroom discussion. Teachers can initiate a discussion by asking a complex, open-ended question. Students can engage in the discussion by responding both to the question and to the thoughts of others. Each unit in a course has one predefined discussion topic; teachers may add more discussion topics.</i>	3	20%
<b>Unit Activity.</b> <i>Unit Activities are at the end a unit and constitute one or more small tasks. Their purpose is to deepen understanding of key unit concepts and tie them together. Each Unit Activity includes a simple rubric. The teacher versions include both a rubric and modeled sample answers. Unit Activities are teacher graded.</i>	3	20%
<b>Posttest.</b> <i>The posttest appears at the end of the unit and mirrors the pretest in structure, content, and complexity.</i>	3	20%
<b>End of Semester Test.</b> <i>The end of semester test (EOS) appears at the end of the course. Students are delivered a few items from every tutorial in the course in order to assess the major course objectives.</i>	1	20%
<b>Total</b>	<b>25</b>	<b>100%</b>

\*Teachers may manually adjust these weights if desired, per district grading requirements.

## Unit 1: Engineering and Manufacturing

### Summary

In this unit, you'll describe the evolution of technology and advancements in the field of engineering. You'll also describe information technology skills required to use computers and software/programs effectively. In addition, you'll explain the evolution of manufacturing and describe various manufacturing processes, systems, and concepts.

Day	Activity/Objective	Type
1 day: 1	<b>Syllabus and Plato Student Orientation</b> <i>Review the Plato Student Orientation and Course Syllabus at the beginning of this course.</i>	Course Orientation
5 days: 2–6	<b>Engineering and Technology</b> <i>Describe the evolution of technology and advancements in the field of Engineering.</i>	Lesson
5 days: 7–11	<b>Information Technology</b> <i>Describe information technology skills required to use computers and software/programs effectively.</i>	Lesson
5 days: 12–16	<b>Evolution of Manufacturing</b> <i>Explain the evolution of manufacturing and describe various manufacturing processes, systems, and concepts.</i>	Lesson
1 day: 17	<b>Space Jumble</b>	Game
5 days: 18–22	<b>Unit Activity/Threaded Discussion—Unit 1</b>	Activity
1 day: 23	<b>Post-test—Unit 1</b>	Assessment

## Unit 2: Manufacturing Processes and Engineering Drawings

### Summary

In this unit, you'll describe different materials used in manufacturing and their applications. You'll also explain different manufacturing processes and describe their use of various tools, equipment, machines, and materials. Then, you'll describe the evolution of measuring instruments and types of precision instruments. Finally, you'll apply basic mathematical formulae used in manufacturing and analyze engineering drawings.

Day	Activity/Objective	Type
6 days: 24–29	<b>Materials in Manufacturing</b> <i>Describe different materials used in manufacturing and their applications.</i>	Lesson
6 days: 30–35	<b>Manufacturing Processes</b> <i>Explain different manufacturing processes and describe their use of various tools, equipment, machines, and materials.</i>	Lesson
6 days: 36–41	<b>Measurement and Instrumentation</b> <i>Describe the evolution of measuring instruments and types of precision instruments.</i>	Lesson
6 days: 42–47	<b>Manufacturing Mathematics and Engineering Drawings</b> <i>Apply basic mathematical formulae used in manufacturing and analyze engineering drawings.</i>	Lesson
1 day: 48	<b>Thwack-A-Mole</b>	Game
6 days: 49–54	<b>Unit Activity/Threaded Discussion—Unit 2</b>	Activity
1 day: 55	<b>Post-test—Unit 2</b>	Assessment

## Unit 3: Computer-Aided Design and Production

### Summary

In this unit, you'll explain computer-aided design and manufacturing. You'll also explain and compare mass, lean, and agile production. Then, you'll describe how to set goals and manage time and resources effectively. In addition, you'll explain the importance of critical-thinking and problem-solving skills and describe the fundamental steps in analyzing and resolving problems. Finally, you'll explain the importance of creativity and resourcefulness and describe various methods for evaluating problems and generating creative solutions.

Day	Activity/Objective	Type
5 days: 56–60	<b>Computer-aided Design, Simulation, and Manufacturing</b> <i>Explain computer-aided design and manufacturing.</i>	Lesson

<b>Day</b>	<b>Activity/Objective</b>	<b>Type</b>
5 days: 61–65	<b>Mass, Lean, and Agile Production</b> <i>Explain and compare mass, lean, and agile production.</i>	Lesson
4 days: 66–69	<b>Time, Task, and Resource Management</b> <i>Describe how to set goals and manage time and resources effectively.</i>	Lesson
4 days: 70–73	<b>Critical Thinking and Problem Solving</b> <i>Explain the importance of critical-thinking and problem-solving skills and describe the fundamental steps in analyzing and resolving problems.</i>	Lesson
4 days: 74–77	<b>Creative Resourcefulness</b> <i>Explain the importance of creativity and resourcefulness and describe various methods for evaluating problems and generating creative solutions.</i>	Lesson
1 day: 78	<b>Para Jumble</b>	Game
5 days: 79–83	<b>Unit Activity/Threaded Discussion—Unit 3</b>	Activity
1 day: 84	<b>Post-test—Unit 3</b>	Assessment
4 days: 85–88	<b>Course Activity</b>	Activity
1 day: 89	<b>Semester Review</b>	
1 day: 90	<b>End-of-Semester Test</b>	Assessment

## Course Map

You will achieve course level objectives by completing each lesson’s instruction, assignments, and assessments. For a detailed look at how the materials meet these objectives, review the [course map for Semester A](#).