Syllabus

PLATO Course Principles of Engineering and Technology, Semester B

Course Overview

This one-semester course is intended to help you familiarize yourself with the process of engineering design and examine manufacturing technologies and processes. This course has seventeen lessons organized into four units. Each unit has a Unit Activity and each lesson contains one or more Lesson Activities.

This course will cover the concepts in engineering design, manufacturing processes and materials, communication skills, and team and resource management.

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

This course will help you meet the following goals:

- Explain the design process.
- Examine methods for evaluating problems and generating creative solutions.
- Compare energy sources and explain the principles of electrical power generation and transmission.
- Analyze various manufacturing processes and materials.
- Examine the applications of different types of engineering control systems.
- Analyze safety systems and demonstrate safe working habits.
- Identify some important employability characteristics.
- Demonstrate good communication skills.

- Demonstrate time, task, and resource management.
- Discuss the importance of teamwork and demonstrate team management skills.

Prerequisite Skills

Principles of Engineering and Technology Semester B 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

Principles of Engineering and Technology Semester B 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 instructor may modify the schedule to meet the specific needs of your class.

Unit 1: Engineering Design

Summary

In this unit, you will examine the process of engineering design and apply the principles of ideation and decision-making strategies in engineering design. You will explain the importance of creativity and resourcefulness in the workplace. You will describe the fundamental steps of analyzing and finding solutions to a problem.

Day	**Activity/***Objective*	Type
1 day: 1	**Syllabus and Plato Student Orientation** *Review the Plato Student Orientation and Course Syllabus at the beginning of this course.*	Course Orientation
4 days: 2–5	**The Engineering Design Process** *Describe and analyze the stages of the engineering design process and identify the constraints in design.*	Lesson
4 days: 6–9	**Creative Resourcefulness** *Demonstrate creativity and resourcefulness by contributing new ideas and working with initiative.*	Lesson
3 days: 10–12	**Critical Thinking and Problem Solving** *Demonstrate critical-thinking and problem-solving skills by analyzing and resolving problems that arise in completing assigned tasks.*	Lesson
1 day: 13	**Space Jumble**	Game
4 days: 14–17	**Unit Activity/Threaded Discussion—Unit 1**	Activity
1 day: 18	**Post-test—Unit 1**	Assessment

Unit 2: Manufacturing and Safety

Summary

In this unit, you will compare energy sources and describe the principles of electrical power generation and transmission. You will analyze the properties of different types of engineering materials. You will describe manufacturing processes and examine industrial automation concepts. You will identify the components of various control systems and discuss their applications. You will analyze safety systems and demonstrate safe working habits.

Day	**Activity/***Objective*	Type
4 days: 19–22	**Energy Sources** *Compare energy sources and describe power generation systems.*	Lesson
4 days: 23–26	**Properties of Materials** *Identify the major types of engineering materials and analyze their properties.*	Lesson
4 days: 27–30	**Manufacturing Processes and Automation** *Analyze manufacturing processes and describe industrial automation concepts.*	Lesson
4 days: 31–34	**Control Systems** *Describe the types of engineering control systems and explain their applications.*	Lesson
4 days: 35–38	**Safety in Engineering** *Demonstrate safe working habits and examine safety systems in engineering.*	Lesson
1 day: 39	**Thwack-A-Mole**	Game
4 days: 40–43	**Unit Activity/Threaded Discussion—Unit 2**	Activity
1 day: 44	**Post-test—Unit 2**	Assessment

Unit 3: Communication

Summary

In this unit, you will describe appropriate workplace etiquette. You will apply effective reading and writing strategies. You will demonstrate effective speaking and listening skills. You will analyze the use of various telecommunication devices and services. You will discuss strategies for providing improved customer satisfaction.

Day	**Activity/***Objective*	Type
4 days: 45–48	**Self-Representation** *Demonstrate positive self-representation skills by dressing appropriately and using language and manners suitable for the workplace.*	Lesson
3 days: 49–51	**Reading and Writing** *Demonstrate effective reading and writing skills by reading and interpreting workplace documents and writing clearly.*	Lesson
3 days: 52–54	**Speaking and Listening** *Demonstrate effective speaking and listening skills by communicating effectively with customers and employees and following directions.*	Lesson
4 days: 55–58	**Telecommunications** *Demonstrate proficiency with telecommunications by selecting and using appropriate devices, services, and applications.*	Lesson
4 days: 59–62	**Customer Service** *Demonstrate customer service skills by identifying and addressing the needs of all customers and providing helpful, courteous, and knowledgeable service.*	Lesson
1 day: 63	**Para Jumble**	Game
4 days: 64–67	**Unit Activity/Threaded Discussion—Unit 3**	Activity
1 day: 68	**Post-test—Unit 3**	Assessment

Unit 4: Team Management

Summary

In this unit, you will explain how to prioritize tasks to meet timelines and demonstrate resource management skills. You will identify leadership qualities required to build an effective team. You will examine strategies to resolve workplace conflicts and demonstrate diversity awareness.

Day	**Activity/***Objective*	Type
4 days: 69–72	**Time, Task, and Resource Management** *Demonstrate time, task, and resource management skills by organizing and implementing a productive plan of work.*	Lesson
4 days: 73–76	**Teamwork** *Demonstrate teamwork skills by contributing to the success of the team, assisting others, and requesting help when needed.*	Lesson
3 days: 77–79	**Diversity Awareness** *Demonstrate diversity awareness by working well with all customers and coworkers.*	Lesson
3 days: 80–82	**Conflict Resolution** *Demonstrate conflict-resolution skills by negotiating diplomatic solutions to avoid interpersonal and workplace issues.*	Lesson
1 day: 83	**Space Jumble**	Game
4 days: 84–87	**Unit Activity/Threaded Discussion—Unit 4**	Activity
1 day: 88	**Post-test—Unit 4**	Assessment
1 day: 89	**Semester Review**	
1 day: 90	**End-of-Semester Test**	Assessment