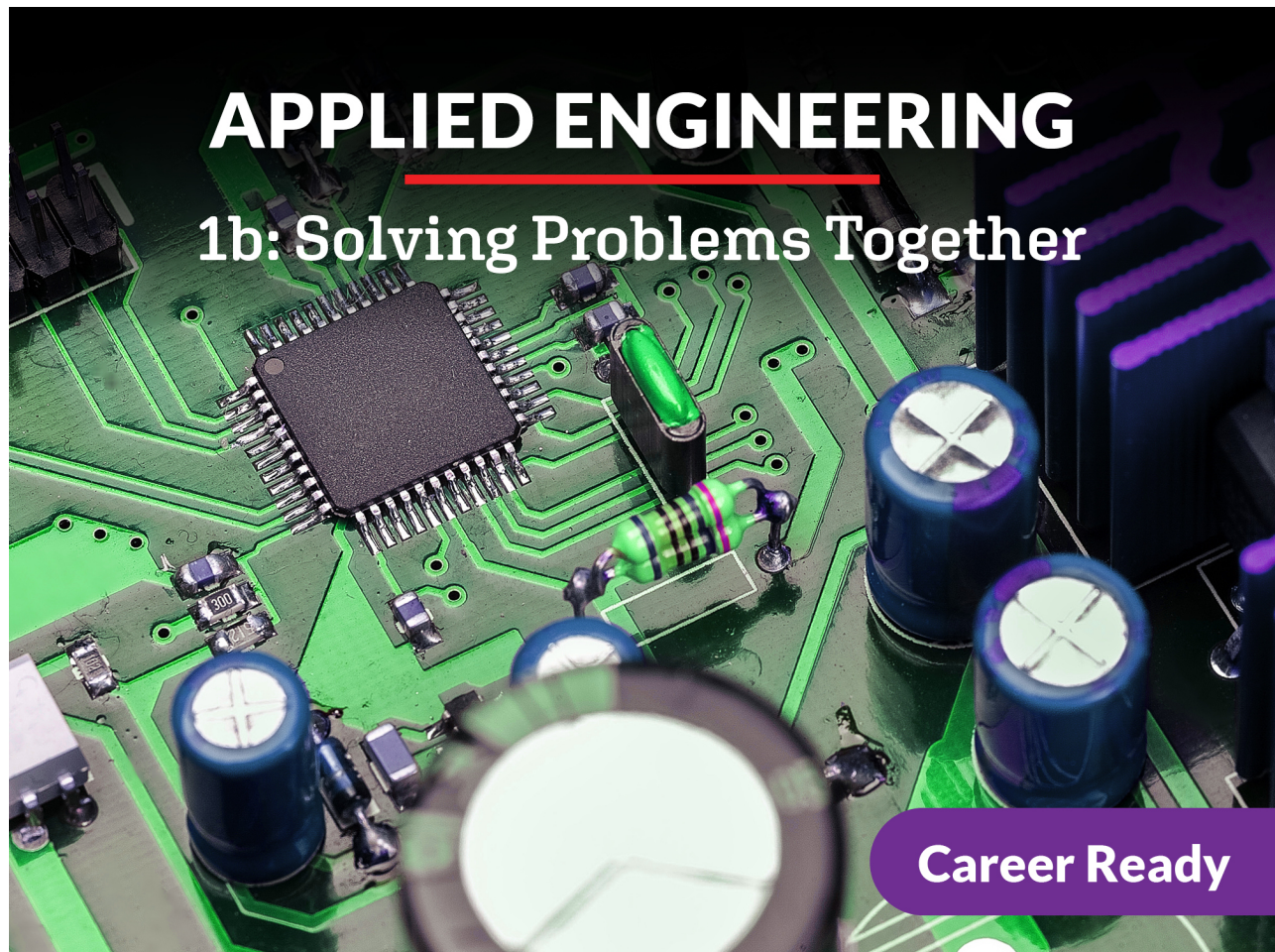


What you will learn in this course

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## **Applied Engineering 1b: Solving Problems Together**

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Do you like to invite solutions to solve problems? Applied engineering has advanced areas such as energy, transportation, health and genetics, alternative energy, food packaging, etc. Explore various inventions and solutions that have solved problems across industries. Examine how artificial intelligence and technology are making an impact on breakthroughs. Evaluate the range of robotic and STEM-related career options available for you to make a difference in lives with your contributions and innovations.

### **Unit 1: Think About It: Problem Solving in the Real World**

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Viktor Schaubberger was an Austrian philosopher and inventor, as well as a proponent of creating new technology by mimicking nature. In the 1990s, while looking for a sustainable way to protect a river's banks during flooding, Otmar Grober, a master river engineer in Austria, implemented some of Schaubberger's concepts by controlling the river's characteristics from the inside out by

adding boulders and reconfiguring the center of the river instead of building up the banks. This approach to solving problems from the inside out is just one of the approaches to thinking that can further our understanding of the relationship between a problem and its solution(s). We will also take a look at how technology can assist us in solving some of the most complex problems in history.

**What will you learn in this unit?**

- Describe how we use technology to solve problems
- Analyze how the development of technology affects various systems
- Differentiate types of thinking processes involved in problem-solving
- Outline the steps involved in marketing a product or implementing a solution

UNIT 1 Assignments	
Assignment	Type
Unit 1 Text Questions	Homework
Unit 1 Lab	Homework
Unit 1 Activity	Homework
Unit 1 Discussion 1	Discussion
Unit 1 Discussion 2	Discussion
Unit 1 Quiz	Quiz

**Unit 2: Working with the Team**

Whether you want to open a startup engineering firm or work for a certain corporation, there are similar roles you may play throughout. How will you manage your time and resources when completing tasks? What is your skill level and what strengths do you bring to your work? In 1885, Gottlieb Daimler and Wilhelm Maybach attached a small diesel engine to a wooden bicycle, producing the first true motorcycle. Speeding along at seven miles per hour, it led the way for today’s popular two-wheeled transportation. But what’s more important than that one invention was their teamwork. What types of skills did they have that complemented each other so well?

**What will you learn in this unit?**

- Critique the importance of ethical and professional behavior
- Draw conclusions about the importance of the characteristics of good leadership and teamwork
- Evaluate member roles of an engineering team
- Summarize the common key tasks for project managers

<b>UNIT 2 Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Unit 2 Text Questions	Homework
Unit 2 Lab	Homework
Unit 2 Activity	Homework
Unit 2 Discussion 1	Discussion
Unit 2 Discussion 2	Discussion
Unit 2 Quiz	Quiz

## Unit 3: Communicating Through the Process

Have you ever heard the saying Teamwork makes the dream work? Well, it's true! From the construction of the pyramids in ancient Egypt to the soaring skyscrapers of today, there's clear evidence that when people pull together, incredible products can result. Today's teams are unique; members can be on separate continents while working toward the same goal! And in some cases, team members aren't even human! How can so many participants stay on the same page when they all bring something different to the table? And how do you get everyone back on track when the process begins to break down? In this unit, we unlock the secrets to productivity using a single key: communication.

### What will you learn in this unit?

- Identify and implement conflict resolution techniques
- Communicate across time zones with people of various cultures
- Describe and demonstrate professional expectations
- Classify various methods of communication

## UNIT 3 Assignments

Assignment	Type
Unit 3 Text Questions	Homework
Unit 3 Lab	Homework
Unit 3 Activity	Homework
Unit 3 Discussion 1	Discussion
Unit 3 Discussion 2	Discussion
Unit 3 Quiz	Quiz

## Unit 4: STEM Careers in Action

In the near future, you will be looking toward a career that satisfies both your income and lifestyle—but how do you get there? What degree or certification do you need to work for a particular industry? In this unit, we'll do a cross-curricular study of science, technology, engineering, and math (STEM) and learn how it can be our vehicle to achieve that future career goal. We also discover how STEM industries utilize expert engineers and how you, as an engineer, can have a variety of career options in many sectors of industry.

### What will you learn in this unit?

- Make the connection of how STEM is integrated in our society
- Study the similarities and differences in various STEM industries
- List the advantages and disadvantages of alternative power sources
- Correlate emerging technologies with future careers

## UNIT 4 Assignments

Assignment	Type
Unit 4 Text Questions	Homework
Unit 4 Lab	Homework
Unit 4 Activity	Homework
Unit 4 Discussion 1	Discussion

Unit 4 Discussion 2	Discussion
Unit 4 Quiz	Quiz

## Applied Engineering 1b Midterm Exam

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from the **first** half of the course (Note: You will be able to open this exam only one time.)

<b>MIDTERM</b> Assignments	
Assignment	Type
Midterm Exam	Exam
Midterm Discussion	Discussion

## Unit 5: Spotlight: Technology and the Environment

How are you impacting the environment? Are you helping to enhance it or could you potentially be indirectly harming it? Whether traveling to school, enjoying our heating or air conditioning comforts, or grabbing something to eat via the grocery store or fast food our actions impact the environment. Does that mean we need to change how we operate in this world? Before making any drastic changes, let us first study the ways our technological lives affect our social and natural environments.

### What will you learn in this unit?

- Identify trade-offs that occur when developing new technology
- Draw conclusions about how technology affects the environment
- Describe how various engineering disciplines have helped to lessen our impact on the environment

<b>UNIT 5</b> Assignments	
Assignment	Type

Unit 5 Text Questions	Homework
Unit 5 Lab	Homework
Unit 5 Activity	Homework
Unit 5 Discussion 1	Discussion
Unit 5 Discussion 2	Discussion
Unit 5 Quiz	Quiz

## **Unit 6: Look Toward the Future: Developing New Technologies**

In your engineering journey, new challenges will always keep appearing. Our understanding of the natural world has helped develop new concepts that can be applied to solve our problems and needs. Sometime we have control and can drive that technology on our own terms, while at other times we are pressed for time and are pushed or compelled into making new discoveries.

Whether it's trying to make something smaller, faster, stronger, or generally more efficient, there are limits to everything—but sometimes we are able to go farther than we ever thought we could!

### **What will you learn in this unit?**

- Describe how and why technology progresses
- Identify technological trends and progress in various fields
- Summarize concerns and possibilities related to artificial intelligence
- Discuss the legality of intellectual property

<b>UNIT 6 Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Unit 6 Text Questions	Homework
Unit 6 Lab	Homework
Unit 6 Activity	Homework
Unit 6 Discussion 1	Discussion
Unit 6 Discussion 2	Discussion
Unit 6 Quiz	Quiz

## Unit 7: Contemporary Issues in Engineering

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We have arrived at many technological advances in our society that have created many solutions —yet we keep on having new problems. We’re now making the latest autonomous vehicles and package-carrying drones, but what issues will these cause in the future? We are living in a time when a futuristic world needs to make hard decisions today before it can carry on. We have to weigh the benefits of ideas that may help our society against the problems that they will ultimately create. Will they be worth it? And as someone who may choose a career in the field of technology, which side will you be on?

### What will you learn in this unit?

- Describe contemporary issues in our technology
- Identify sources of technological problems
- Determine interrelated problems among various technological fields
- Plan advocacy around contemporary societal issues

UNIT 7 Assignments	
Assignment	Type
Unit 7 Text Questions	Homework
Unit 7 Lab	Homework
Unit 7 Activity	Homework
Unit 7 Discussion 1	Discussion
Unit 7 Discussion 2	Discussion
Unit 7 Quiz	Quiz

## Unit 8: Spotlight on Robotics

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Humans have been fascinated by robotics for a long time. Being able to build and create them has presented us with incredible challenges and, in many cases, life-changing solutions. Robotic applications can be found in just about every field in industry, which provides many opportunities for your future career. As we come to a close in this final unit, now is the time to attempt to identify your aspirations and resources available to achieve those goals. One thing we have learned over thousands of years of human existence, from pyramids to planes, is that if you can dream it, you can do it!

## What will you learn in this unit?

- Identify how robotic systems play a role in our society
- Research various Career and Technical Student Organizations
- Identify potential competitions and tech challenges to take part in
- Connect robotics to future career goals

<b>UNIT 8 Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Unit 8 Text Questions	Homework
Unit 8 Lab	Homework
Unit 8 Activity	Homework
Unit 8 Discussion 1	Discussion
Unit 8 Discussion 2	Discussion
Unit 8 Quiz	Quiz

## Applied Engineering 1b Final Exam

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- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from the **second** half of the course (Note: You will be able to open this exam only one time.)

<b>FINAL Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Final Exam	Exam
Class Reflection Discussion	Discussion



