Unit 1: Foundations

Starting Your Academic Journey

Learning Objectives

By the end of this unit, you will be able to:

1. Recognize differences between academic and everyday English.
2. Listen to short lectures and take effective notes.
3. Understand and use essential academic and technical vocabulary.
4. Write a clear, structured 150-word self-introduction with academic goals.
5. Speak about your background and goals in an academic context.

Part A – WARM-UP

Activity 1: Discussion

- Why do you think English is important for engineers?
- How might your English skills affect your career opportunities?
- Do you feel more confident in speaking, listening, reading, or writing English? Why?

💡 *Tip for Students:* In engineering, English is not just a subject; it is a **tool for innovation, communication, and professional growth**.

Activity 2: Everyday vs. Academic English

Read the following phrases. Decide if they are **Everyday English** (informal) or **Academic English** (formal, professional).

1. "What's up?"
2. "Could you clarify this concept, please?"

3. “I’m gonna fix it later.”
4. “The experiment demonstrates the principle of fluid dynamics.”

☞ Write **E** for Everyday and **A** for Academic.

◆ Activity 3: Pair Work

Work with a partner. Rewrite the following sentences in **more academic English**:

a) “I wanna check the thing again.”

.....

b) “This stuff is cool.”

.....

c) “I don’t get it.”

.....

d) “Let’s do this project fast.”

.....

Part B – READING

🕮 Reading Passage: *Why Engineers Need English*

Read the passage below carefully. Then answer the questions that follow.

In today’s globalized world, **English has become the universal language of science and technology**. Engineers in every discipline—civil, mechanical, electrical, or computer—are expected to **read, write, and communicate in English**. Research papers, technical manuals, and international conferences all use English as their main medium.

One of the key reasons English is so important for engineers is **teamwork**. Modern engineering projects often involve **collaboration across borders**. A bridge might be designed in Egypt, tested in Germany, and constructed in South America. Without English, effective communication between these teams would be impossible.

Another important use of English in engineering is **technical writing**. Engineers must write reports, proposals, and project documentation. These texts need to be clear, precise, and professional. Poor communication in a report can lead to **costly mistakes** in a project.

Finally, English allows engineers to stay **up-to-date with global innovations**. The majority of research articles, patents, and technical websites are written in English. An engineer who can read these resources will always have a competitive advantage.

In short, English is not just a subject in the classroom. For engineers, it is a **professional tool** that opens doors to knowledge, collaboration, and innovation.

Task 1 – Comprehension Questions

Answer the questions in full sentences.

1. List three reasons why English is important for engineers.

   .....

2. How does English support teamwork in engineering projects?

   .....

3. True/False: Engineers only need English for reading textbooks.

   .....

4. Why is clarity important in technical writing?

   .....

5. What is one benefit of reading English research articles?

   .....

Task 2 – Vocabulary in Context

Find the words in the passage that mean:

1. Working together with others → _____
2. Official suggestion or plan → _____
3. Benefit or strong point → _____
4. Very important → _____
5. To make something clear and easy to understand → _____

Task 3 – True or False

Decide if the following statements are True (T) or False (F). Correct the false ones.

1. Engineers only use English inside the classroom. (___)
2. Reports and proposals must be written in a clear and professional way. (___)
3. Without English, international projects may fail. (___)
4. Engineers can succeed globally without learning English. (___)

Task 4 – Critical Thinking

- In your opinion, what would happen if engineers from different countries could not communicate in English?
- Can you think of another language that might be useful for engineers? Why?
- How can you start preparing yourself to use English professionally in engineering?

Part C – VOCABULARY

🎯 Learning Goals

- Build knowledge of **engineering-related vocabulary**.
- Learn the difference between **general academic words** and **technical terms**.
- Practice using new words in context.

🔹 Section 1 – Academic Vocabulary for Engineers

These words are common in academic and professional engineering texts.

Word	Meaning	Example Sentence
Analyze	To examine carefully	Engineers analyze data before making decisions.
Concept	An idea or principle	The concept of renewable energy is very important today.
Method	A way of doing something	The scientist used a new method to test the material.
Process	A series of steps	The process of building a bridge requires planning.
Research	The study of a subject in detail	Research in robotics is growing quickly.
Data	Facts or information collected	The data shows that the machine works efficiently.
Design	To plan or create something	Engineers design machines to solve real-world problems.
Structure	The arrangement of parts in something	The structure of the bridge must be strong and stable.
System	A group of connected parts working together	The transport system in the city is being upgraded.
Function	The purpose or role of something	The main function of the sensor is to detect movement.
Efficiency	The ability to work well with little waste	Solar panels improve energy efficiency in buildings.
Innovation	A new idea, method, or invention	Innovation drives progress in modern engineering.
Technology	Tools, machines, and methods used to solve problems	Advances in technology have changed communication.

Word	Meaning	Example Sentence
Simulation	A model or imitation of a process	The flight simulation helps pilots practice safely.
Prototype	The first model of a product	The team built a prototype before mass production.
Reliability	The quality of being dependable	Engineers test machines for reliability under stress.
Component	A part of a larger whole	The engine has many small components.
Maintenance	The act of keeping equipment in good condition	Regular maintenance prevents machine breakdowns.
Safety	Protection from danger or risk	Safety standards are important in construction projects.
Load	The amount of weight or force something can carry	The bridge was tested under heavy load conditions.
Material	The substance used to make things	Steel is a common material in construction.
Measurement	The act of finding size, amount, or degree	Accurate measurement is essential in design.
Calculation	The use of mathematics to find a result	The calculation shows how much energy is needed.
Force	A push or pull on an object	Engineers study the force acting on structures.
Energy	The ability to do work	Renewable energy reduces environmental impact.
Capacity	The maximum amount something can hold	The battery has a high storage capacity.
Flow	Movement of liquid, gas, or electricity	The flow of water is controlled by valves.
Voltage	Electrical potential difference	High voltage is dangerous without insulation.
Current	The movement of electric charge	The current flows through the wire.
Resistance	Opposition to electric current	The resistor increases the circuit's resistance.
Circuit	A closed path for electricity	The light bulb is connected to a simple circuit.
Algorithm	A step-by-step procedure for solving a problem	The algorithm sorts the data efficiently.
Database	Organized collection of data	Engineers store information in a database.
Network	A group of connected systems	The computer network allows fast communication.

Word	Meaning	Example Sentence
Software	Computer programs	Engineers develop software for automation.
Hardware	Physical parts of a computer	Hardware must be compatible with software.
Model	A simplified representation of reality	The model helps predict structural behavior.
Equation	A mathematical statement	Engineers solve equations to design safely.
Variable	A changing factor in an experiment	Temperature is a key variable in the test.
Parameter	A limit or condition in a system	The design must fit within certain parameters.
Algorithm	Step-by-step instructions	The sorting algorithm improves performance.
Optimization	Making something as effective as possible	Engineers optimize designs to save cost.
Accuracy	Correctness of a measurement	Accuracy is critical in scientific experiments.
Precision	Exactness and repeatability	The instrument measures with high precision.
Tolerance	The allowed variation in measurement	Machines are built with very small tolerances.
Stress	Force applied per unit area	Engineers calculate stress in materials.
Strain	Deformation caused by stress	The strain increases under heavy load.
Pressure	Force per unit area	Pressure inside the tank must be controlled.
Temperature	Measure of heat	Sensors monitor temperature during the process.
Heat	Form of energy	Heat transfer occurs in engines.
Cooling	Removing heat	The cooling system prevents overheating.
Power	The rate of doing work	The motor produces high power.
Speed	How fast something moves	The car reached high speed on the track.
Velocity	Speed in a given direction	The rocket's velocity increased steadily.
Acceleration	Change in velocity over time	Acceleration was measured in the test.
Friction	Resistance between surfaces	Friction slows down moving objects.
Gravity	The force pulling objects to Earth	Gravity affects all structures.
Strength	The ability to resist force	Steel has high tensile strength.
Hardness	Resistance to being scratched	Diamonds have maximum hardness.
Elasticity	Ability to return to original shape	Rubber has high elasticity.

Word	Meaning	Example Sentence
Ductility	Ability to be stretched into a wire	Copper shows good ductility.
Conductivity	Ability to carry electricity or heat	Silver has the best conductivity.
Insulation	Preventing heat or electricity transfer	Plastic is used for electrical insulation.
Magnetism	Force of attraction of magnets	Magnetism is used in electric motors.
Frequency	Number of cycles per second	The signal has a high frequency.
Wave	A repeating disturbance	Sound travels as a wave.
Signal	Information transmitted as a wave or code	The antenna sends a radio signal.
Noise	Unwanted disturbance in data or sound	Engineers filter noise from signals.
Control	The ability to regulate a system	Automatic control improves safety.
Automation	Use of machines to operate without humans	Automation reduces labor costs.
Robotics	Use of robots in engineering	Robotics helps in manufacturing cars.
Programming	Writing instructions for a computer	Programming is essential for software engineers.
Code	Instructions in a programming language	The engineer wrote a code for the robot.
Debugging	Finding and fixing errors in code	Debugging is part of software development.
Encryption	Protecting data by coding it	Encryption keeps communication secure.
Storage	Saving data or materials	Cloud storage is used for large files.
Transmission	Sending signals or power	Fiber optics allow fast data transmission.
Infrastructure	Basic physical systems	Roads and bridges are part of infrastructure.
Foundation	The base of a structure	The building needs a deep foundation.
Construction	The act of building	Construction of the dam took years.
Manufacturing	Making products in factories	Manufacturing uses advanced machines.
Assembly	Putting parts together	Assembly lines speed up production.
Welding	Joining metal parts with heat	Welding is common in shipbuilding.
Drilling	Making holes in materials	Drilling is used in oil extraction.
Mining	Extracting materials from Earth	Mining provides raw materials.
Refining	Making raw materials pure	Oil refining produces fuel.
Sustainability	Meeting needs without harming the future	Sustainability is a key goal in engineering.
Pollution	Harmful substances in the environment	Factories must reduce pollution.
Recycling	Reusing materials	Recycling saves resources.
Renewable	Can be replaced naturally	Wind is a renewable energy source.

Word	Meaning	Example Sentence
Non-renewable	Cannot be replaced quickly	Coal is a non-renewable resource.
Emission	Release of gas or radiation	Car emissions affect the environment.
Climate	Weather conditions over time	Engineers design systems for different climates.
Risk	Chance of danger or loss	Engineers calculate risk before building.
Cost	The amount of money required	The project cost exceeded expectations.
Budget	A plan for spending money	The budget includes material expenses.
Project	A planned engineering task	The project took five years to finish.
Deadline	The final date for completion	Engineers must meet the deadline.
Quality	Standard of how good something is	Quality control ensures safety.
Standard	An agreed level of requirement	Machines must follow safety standards.
Specification	Detailed description of requirements	The engineer followed the design specifications.
Regulation	Official rule or law	The factory follows environmental regulations.
Patent	Legal right for an invention	The company received a patent for its design.
Ethics	Moral principles in work	Engineers must follow professional ethics.
Circuit	A closed path for electricity	The circuit was designed to control the motor.
Load	The weight or force a structure carries	The bridge can carry a load of 20 tons.
Prototype	The first model of a product	The company built a prototype of the new engine.
Structure	Something that is built	The structure must be strong and safe.
Mechanism	A system of parts working together	The clock has a complex mechanism.
System	A group of connected parts	The computer system was upgraded.

◆ Section 3 – Exercises

A. Match the Words with Their Meanings

Match each word to the correct meaning.

Word	Meaning
1. Prototype	a) Detailed study of a subject

2. Analyze — b) Weight carried by something
3. Load — c) A closed path for electricity
4. Research — d) A first model of something
5. Circuit — e) An idea or principle
6. Concept — f) To examine carefully

B. Fill in the Blanks

Complete the sentences with the correct word.

1. Engineers must _____ the problem before they solve it.
2. The company is doing _____ on renewable energy.
3. A bridge must carry a heavy _____ safely.
4. The scientist explained the _____ of artificial intelligence.
5. The technician tested the electrical _____.
6. The factory produced the first _____ of the new car.

C. Word Formation

Fill in the correct form of the word in brackets.

1. The _____ (analyze) of the results showed a big improvement.
2. Engineers must always think about the _____ (safe) of structures.
3. The company will _____ (develop) a new system.
4. The project was successful because of good _____ (plan).

Part D – GRAMMAR

🎯 Learning Goals

- Review **sentence structure** (simple, compound, complex).

- Practice the **Present Simple & Present Continuous** in academic/engineering contexts.
- Learn to describe facts, processes, and ongoing actions.

Section 1 – Sentence Structure Review

1. **Simple Sentence** → One idea, one clause.
    - Example: *The engine runs efficiently.*
2. **Compound Sentence** → Two ideas joined with *and, but, or, so*.
    - Example: *The bridge is strong, and it can carry heavy loads.*
3. **Complex Sentence** → One main clause + one dependent clause.
    - Example: *The students took notes because the lecture was important.*

☞ **Engineering Tip:** In technical writing, clear **simple and compound sentences** are often better than very long sentences.

Section 2 – Present Simple

We use **Present Simple** to talk about:

- **Facts:** *Water boils at 100°C.*
- **General truths:** *Electricity flows through a circuit.*
- **Regular actions:** *Engineers test prototypes every week.*

Section 3 – Present Continuous

We use **Present Continuous** to talk about:

- **Actions happening now:** *The professor is explaining the concept.*
- **Temporary situations:** *The students are working on a project.*

- **Trends:** *The company is developing new technology.*

Section 4 – Grammar in Engineering Contexts

Compare:

- *The machine works well.* (general fact – Present Simple)
- *The machine is working well today.* (temporary condition – Present Continuous)
- *Researchers analyze data.* (regular action)
- *Researchers are analyzing new data right now.* (happening now)

Section 5 – Exercises

A. Identify the Sentence Type

Label each as **Simple (S)**, **Compound (C)**, or **Complex (CX)**.

1. The computer system crashed.
2. The material is strong, but it is very expensive.
3. Engineers study hard because their subjects are difficult.
4. I read books, and I also write reports.
5. The robot stopped working when the battery died.

B. Fill in the Correct Verb Form

Use **Present Simple** or **Present Continuous**.

1. The lecturer _____ (explain) the concept of circuits now.
2. The machine usually _____ (stop) after two hours.
3. We _____ (test) the prototype this week.

4. Students always _____ (take) notes in class.
5. The company _____ (develop) new energy systems at the moment.

C. Rewrite the Sentences in Academic English

1. "The thing is working good." → _____
2. "We always do this stuff fast." → _____
3. "The guy is checking the thing now." → _____

Part E – WRITING

🎯 Learning Goals

- Learn how to organize a short academic text.
- Write a clear **self-introduction** with personal and academic details.
- Use correct grammar, vocabulary, and paragraph structure.

🔹 Section 1 – Model Reading: A Student Introduction

Read the following introduction written by an engineering student.

Sample Text (≈150 words):

My name is Ahmed Khaled. I am a first-year student in the Faculty of Engineering. I chose to study mechanical engineering because I am interested in machines and how they work. Since I was young, I have enjoyed fixing bicycles, computers, and other devices.

My academic goal is to become a skilled engineer who can design sustainable machines. I believe renewable energy is the future, and I would like to contribute to this field. At the university, I hope to improve my English skills, especially in technical writing and presentation.

In addition to my studies, I enjoy playing football and reading books about technology. These hobbies help me relax and also give me new ideas. I am excited about learning from my professors and classmates, and I want to build a strong academic and professional future.

Section 2 – Structure of an Academic Self-Introduction

1. **Opening** → Name, background, why you study engineering.
2. **Academic Goals** → What you want to achieve at university.
3. **Future Plans** → Your career or research interests.
4. **Personal Touch** → Hobbies, interests, unique skills.
5. **Closing** → Positive note about your motivation.

Section 3 – Language Focus

- Use **Present Simple** for facts: *I study civil engineering.*
- Use **Present Continuous** for ongoing study: *I am learning technical English.*
- Use linking words: *first, also, in addition, because, therefore, however, finally.*
- Avoid contractions (write *I am* not *I'm*) in academic texts.

◆ Section 4 – Guided Writing

Step 1 – Brainstorming (Fill in the table):

Topic	My Notes
Name & background	_____
Why engineering?	_____
Academic goals	_____
Future plans	_____
Hobbies/interests	_____

Step 2 – Organize Ideas:

Write 1–2 sentences for each part of the structure.

Step 3 – Drafting:

Write your first version (120–150 words).

◆ Section 5 – Exercises

A. Sentence Building

Combine the ideas into complete sentences.

1. My name / Omar / from Cairo.
2. I / choose / study / civil engineering / interested in buildings.
3. My academic goal / improve / English writing skills.
4. In the future / I want / design smart cities.
5. My hobbies / reading books / swimming.

B. Connectors Practice

Fill in the blanks with: **because, also, in addition, however, finally.**

1. I chose electrical engineering _____ I enjoy working with circuits.
2. I want to improve my speaking skills. _____, I will join the English club.
3. I like studying hard. _____, I need time for sports.
4. I am interested in computers. _____, I am curious about renewable energy.
5. _____, I hope to become a professional engineer.

C. Writing Task

Write a **150-word self-introduction** following the structure.

Part F – SPEAKING

🎯 Learning Goals

- Introduce yourself clearly in an academic context.

- Ask and answer questions about background, goals, and interests.
- Practice pronunciation and fluency.

Section 1 – Model Dialogue

Read the conversation between two first-year engineering students.

Student A (Sara): Hello, my name is Sara Mahmoud. I'm a first-year civil engineering student. What about you?

Student B (Ali): Nice to meet you, Sara. My name is Ali Hassan, and I'm studying electrical engineering.

Sara: Great! Why did you choose electrical engineering?

Ali: Because I'm interested in renewable energy and smart systems. And you?

Sara: I chose civil engineering because I want to design sustainable buildings.

Ali: That's interesting! What are your goals this year?

Sara: I want to improve my technical English and learn how to write research reports.

Ali: Me too. Let's practice English together.

Section 2 – Useful Phrases for Academic Introductions

- **Introducing Yourself:**
  - My name is … / I am …
  - I am a first-year student in … engineering.
  - I come from … / I live in …
- **Talking about Goals:**
  - My academic goal is …

- I would like to …
- In the future, I hope to …

- **Showing Interest:**
  - That sounds interesting.
  - I see. / I understand.
  - Could you tell me more about …?

Section 3 – Pronunciation Focus

Practice saying these pairs aloud. Pay attention to stress and clarity.

- engineer / engineering
- research / researcher
- system / systematic
- project / projection
- design / designer

☞ *Tip:* Stress usually falls on the first syllable in **nouns** (*PROject*), and on the second syllable in **verbs** (*proJECT*).

Section 4 – Exercises

A. Pair Work: Introduce Yourself

Take turns with a partner. Introduce yourself using:

1. Name & background
2. Field of engineering
3. Academic goal

4. Future plan
5. One hobby or interest

B. Role-Play: Networking at University

Imagine you meet a new classmate at the engineering library. Use the dialogue model to introduce yourself and ask about their goals.

C. Pronunciation Drill

Repeat the following sentences after your teacher:

1. I am studying *mechanical engineering*.
2. The *project* is very important.
3. My academic *goal* is to do good *research*.
4. The *system* is working correctly.
5. I want to *design* a new prototype.

◈ Section 5 – Self-Evaluation Checklist

Check (✔) if you can:

- ☐ Introduce myself in academic English.
- ☐ Ask about another student's goals.
- ☐ Use polite and formal expressions.
- ☐ Pronounce key academic words clearly.

Part G – LISTENING

🎯 Learning Goals

- Understand the main idea and details of a short academic lecture.
- Take effective notes while listening.
- Summarize information in your own words.

🔹 Section 1 – Pre-Listening Discussion

1. How do you usually take notes in class? Do you write full sentences or keywords?
2. Why is note-taking important for engineering students?
3. Which is more difficult for you: listening for the main idea or for details?

🔹 Section 2 – Lecture Transcript (≈200 words)

Title: Why Engineers Need English

Good morning, everyone. Today, I will explain why English is important for engineers. First, English is the global language of science and technology. Most research papers, technical manuals, and engineering software are written in English.

Second, English is necessary for communication. Engineers often work in international teams. For example, a civil engineer in Egypt may cooperate with architects in Germany or Japan. English helps them share ideas clearly.

Third, English is essential for career development. Many international companies require engineers who can write reports, deliver presentations, and attend conferences in English. Without good English skills, some opportunities may be lost.

Finally, English is not only useful for work. It also opens the door to new knowledge. Engineers can watch online lectures, join global discussions, and learn about the latest innovations. For these reasons, English is a key skill for every engineering student.

Section 3 – While-Listening Tasks

A. Note-Taking Practice

Listen to the lecture and take notes in keywords, not full sentences. Use the table below:

Main Idea	Notes
English is global	_____
English for teamwork	_____
English for careers	_____
English for knowledge	_____

B. Comprehension Questions

Answer in full sentences.

1. Why is English the global language of science and technology?

   .....

2. How does English help engineers in teamwork?

   .....

3. What do international companies expect from engineers?

   .....

4. What kind of knowledge can engineers access through English?

   .....

C. True or False

1. Most engineering research papers are written in English.
2. Engineers usually work only in local teams.
3. English is important only for work, not for learning.
4. Engineers can attend conferences in English.

◈ Section 4 – Post-Listening Task

Summarizing Exercise

Write a short summary (4–5 sentences) of the lecture in your own words.

Part H – UNIT REVIEW & REFLECTION

🎯 Learning Goals

- Revise all skills from Unit 1 (reading, vocabulary, grammar, writing, speaking, listening).
- Check understanding through review exercises.
- Reflect on personal progress and set goals for Unit 2.

◈ Section 1 – Review Exercises

A. Vocabulary Check

Choose the correct word from the box to complete the sentences.

Words: analyze – research – circuit – load – concept – prototype

1. The company built the first _____ of the new car.
2. Students must _____ the data carefully before writing reports.
3. A bridge must carry a heavy _____ safely.
4. English is important in engineering because it is the language of scientific _____.
5. The _____ of renewable energy is becoming very popular.
6. The electrician tested the _____ in the laboratory.

B. Grammar Review

Fill in the blanks with the correct form of the verb.

1. Engineers usually _____ (design) structures that are safe.
2. The lecturer _____ (explain) the concept right now.
3. The machine _____ (stop) automatically after one hour.
4. The students _____ (work) on their self-introductions this week.

C. Reading Review

Read the short passage and answer the questions.

Passage:

Engineering is one of the most important fields in the modern world. Engineers solve problems and improve our lives. For example, civil engineers build safe roads and bridges, while electrical engineers design modern communication systems. Mechanical engineers create machines that make work easier. All of these engineers must study hard, and they must also learn to work in teams.

Questions:

1. What do engineers do in general?
2. What do civil engineers build?
3. Why are teamwork skills important for engineers?

D. Writing Review

Write a **short paragraph (70–80 words)**:

- Topic: *Why I want to be an engineer*

- Include at least **two academic goals** and **one hobby**.

E. Speaking Review (Pair Work)

- With a partner, take turns asking and answering:
    1. What is your name and field of study?
    2. Why did you choose engineering?
    3. What are your goals this semester?
    4. What is one hobby you enjoy?

F. Listening Review

Listen again to the **mini-lecture on English for Engineers** (Part G).

- Write **3 key ideas** you remember without looking at your notes.
- Share with a partner.

Section 2 – Reflection

Complete the self-assessment checklist.

Skill	Yes	A little	Not yet
I can introduce myself in academic English.	[ ]	[ ]	[ ]
I can take notes while listening to a lecture.	[ ]	[ ]	[ ]
I know 10 new academic/technical words.	[ ]	[ ]	[ ]
I can write a 150-word self-introduction.	[ ]	[ ]	[ ]
I can use Present Simple and Present Continuous correctly.	[ ]	[ ]	[

Unit 2: Communication Skills for Engineers

Building Effective Academic & Professional Communication

🎯 Learning Objectives

By the end of this unit, students will be able to:

1. Identify features of clear academic communication.

2. Use polite expressions for classroom and professional interaction.
3. Expand vocabulary related to teamwork and presentations.
4. Practice Present Perfect tense in academic contexts.
5. Write a short professional email to a professor.
6. Give a short spoken presentation about a simple engineering topic.
7. Listen to a short seminar discussion and take notes effectively.

Part A – Warm-Up: Everyday vs. Professional Communication

1. Introduction

Engineers often use **different styles of communication** depending on the situation. At home or with friends, we may speak casually, but in classrooms, meetings, or workplaces, we need clear, polite, and professional English. This warm-up will help you notice the differences and practice switching between the two styles.

2. Discussion Questions

Work in pairs or small groups. Discuss the following:

1. How do you greet your best friend? How do you greet your professor?
2. Do you use the same words with your classmates and with your manager? Why or why not?
3. What problems might happen if an engineer speaks too casually in a professional meeting?

3. Activity: Compare the Styles

Read the two conversations. Which one is **everyday casual** and which is **professional**?

Dialogue 1 (Casual)

- Student A: “Hey, what’s up? Did you get that thing done?”
- Student B: “Yeah, almost. I’ll finish it later.”

Dialogue 2 (Professional)

- Student A: “Good morning. Have you completed the report?”
- Student B: “Yes, I have nearly finished. I will send it to you this afternoon.”

☞ **Task:** Underline the polite and formal expressions in Dialogue 2.

4. Role-Play Practice

Work in pairs. Practice saying each dialogue aloud. Notice how your tone and choice of words change. Then create your own short role-play for:

- Talking to a classmate about a homework problem.
- Talking to your professor about submitting the homework late.

5. Quick Vocabulary Focus

Match the casual expressions with their professional equivalents:

Casual Expression	Professional Expression
“What’s up?”	a) “That’s absolutely fine.”
“Gimme a sec.”	b) “See you soon.”
“No problem.”	c) “Good morning, how are you?”

Casual Expression	Professional Expression
“Yeah, sure.”	d) “Certainly.”
“Later.”	e) “Could you give me a moment, please?”

☞ **Task:** Write the correct letters (a–e) next to each casual expression.

6. Reflection

Think about your own English. Do you usually use casual expressions, professional expressions, or a mix of both? Write 3 sentences you often say, and rewrite them in a more professional style.

Part B – Reading: Email Communication in Engineering

1. Pre-Reading Discussion

Discuss in pairs or small groups:

1. Do you usually write emails in English? To whom?
2. What mistakes do students often make in emails to professors or companies?
3. Why is email considered a professional communication tool?

2. Reading Text

Read the following short article carefully.

📄 Article: Writing Professional Emails as an Engineer

In the modern workplace, email is one of the most common ways engineers communicate. Unlike text messages or social media posts, emails require a clear structure and a professional

tone. A well-written email helps to build trust, avoid misunderstandings, and present you as a reliable engineer.

A professional email usually includes four parts. The first part is the **greeting**, where you politely address the reader (for example: *Dear Professor Ahmed*). The second part is the **introduction and purpose**, where you explain why you are writing. The third part is the **main message**, which should be clear, brief, and organized into short paragraphs. Finally, the fourth part is the **closing**, where you thank the reader and sign off with your name (for example: *Sincerely, Mariam Hassan*).

Engineers must remember that email is not only about sharing information, but also about showing respect and professionalism. Careless spelling, informal words, or missing details can make a negative impression. On the other hand, polite and precise emails help engineers succeed in academic and professional contexts.

3. Vocabulary Focus

Match the words from the article with their definitions:

Word	Definition
reliable	(a) To say something in a polite and kind way
greeting	(b) A person or thing you can depend on
purpose	(c) The reason for doing something
impression	(d) An effect or feeling left on someone
polite	(e) The way you say “hello” or start communication

☞ **Task:** Write the correct letters (a–e) next to each word.

4. Comprehension Questions

Answer the questions in complete sentences.

1. Why is email important for engineers?

   .....

2. What are the four main parts of a professional email?

   .....

3. What can happen if you write an email carelessly?

   .....

4. How does a well-written email help an engineer?

   .....

5. Skill Practice: Rewrite the Email

Below is an example of a poorly written student email to a professor. Rewrite it in a **professional style**.

Bad Example:

hi prof,

i cant come to class tmrw coz i have stuff. can u send notes? thx.

Good Example (Rewrite here):

……

……

Part C – Vocabulary & Technical Terms

1. Introduction

In engineering, precise vocabulary is essential. The same word may have a different meaning in everyday life and in a technical context. In this section, you will learn useful vocabulary for **professional and technical communication**.

2. Everyday vs. Technical Meaning

Match the everyday word with its technical meaning in engineering.

Everyday Word	Everyday Meaning	Technical Meaning in Engineering
stress	Feeling worried or nervous	The force applied per unit area on a material
load	Things you carry or transport	The weight or force supported by a structure
current	Happening now	The flow of electric charge through a circuit
power	Energy or control	The rate of doing work, measured in watts
circuit	A complete journey or path	A closed path through which electricity flows

☞ **Task 1:** Fill in the blanks using the correct technical meaning:

1. The bridge was designed to carry a maximum _____ of 10,000 kg.
2. High _____ in the material can cause cracks.
3. The engineer measured the electric _____ with a device.
4. A short _____ can damage the entire system.
5. Solar panels generate _____ from sunlight.

3. Word Formation

Many engineering words are formed by adding **prefixes** and **suffixes**.

- **Prefix examples:** *inter-* (between), *auto-* (self), *micro-* (small).
- **Suffix examples:** *-tion* (process), *-er* (person), *-ment* (result).

◆ **Prefixes in Engineering**

Prefix	Meaning	Example Word	Explanation
inter-	between, among	**interface**	point where two systems meet
intra-	within	**intramural**	within walls or boundaries
trans-	across, beyond	**transmitter**	device that sends signals across distance
auto-	self	**autopilot**	self-controlling system
bio-	life	**biomaterial**	material derived from living organisms
micro-	small	**microchip**	small integrated circuit
nano-	billionth (10^{-9})	**nanotechnology**	technology at nanometer scale
macro-	large, long	**macroeconomics**	large-scale system
multi-	many	**multimeter**	device measuring many electrical properties
poly-	many	**polymer**	substance made of many units
uni-	one	**unidirectional**	moving in one direction
bi-	two	**bipolar**	having two poles
tri-	three	**tricycle**	vehicle with three wheels
quadri-	four	**quadrilateral**	four-sided figure
re-	again, back	**reactivate**	make active again
pre-	before	**preheat**	heat beforehand
post-	after	**postprocess**	processing after main process
sub-	under, below	**submarine**	vessel under the sea
super-	above, beyond	**superconductor**	material with zero resistance
ultra-	beyond, extreme	**ultrasound**	sound beyond human hearing
hyper-	over, excessive	**hyperspeed**	extremely high speed
hypo-	under, less	**hypodermic**	under the skin
co- / com- / con-	together, with	**coordinate**	work together in order
de-	reverse, remove	**deactivate**	turn off, make inactive
dis-	opposite, apart	**disconnect**	break a connection
ex-	out of, from	**export**	send out

Prefix	Meaning	Example Word	Explanation
en- / em-	cause to, put into	**empower**	give power to
pro-	forward, in favor of	**progress**	move forward
anti-	against	**antivirus**	against computer viruses
contra-	opposite	**contradict**	say the opposite
tele-	far, distant	**telecommunication**	communication over distance
geo-	earth	**geothermal**	heat from the earth
thermo-	heat	**thermodynamics**	study of heat and energy
hydro-	water	**hydropower**	energy from water
electro-	electricity	**electromagnetism**	electricity + magnetism
aero-	air	**aerodynamics**	science of air movement
chrono-	time	**chronometer**	device measuring time
circum-	around	**circumference**	distance around a circle

- **Suffixes in Engineering**

Suffix	Meaning	Example Word	Explanation
-tion	process, action	**automation**	process of making automatic
-sion	state, action	**expansion**	act of expanding
-ion	act, process	**conduction**	process of conducting heat/electricity
-ment	result, state	**measurement**	result of measuring
-ness	state, quality	**hardness**	quality of being hard
-ity	state, condition	**stability**	condition of being stable
-er	person, agent	**engineer**	person who engineers
-or	person, thing	**generator**	device that generates
-ist	person who does	**scientist**	person who studies science
-ian	specialist	**technician**	specialist in technical work
-ant	agent, thing	**coolant**	substance that cools
-ate	to make, act	**activate**	to make active
-ify	to make, cause	**solidify**	to make solid
-ize	to make, become	**stabilize**	to make stable
-al	relating to	**structural**	relating to structure
-ic	relating to	**magnetic**	relating to magnetism
-ical	pertaining to	**mechanical**	pertaining to mechanics
-ous	full of	**hazardous**	full of danger
-ive	having quality of	**conductive**	having ability to conduct
-able / -ible	capable of being	**reliable**	able to be relied on
-less	without	**wireless**	without wires

Suffix	Meaning	Example Word	Explanation
-graph	instrument for writing/recording	**seismograph**	instrument recording earthquakes
-meter	measuring device	**thermometer**	device measuring temperature
-scope	instrument for viewing	**microscope**	instrument to view small things
-logy	study of	**geology**	study of earth
-nomy	system of rules/laws	**astronomy**	science of celestial laws
-phile	lover of	**technophile**	person who loves technology
-phobia	fear of	**technophobia**	fear of technology

☞ **Task 2:** Complete the table.

Base Word	With Prefix	With Suffix	Meaning
operate	cooperate	operation	Work together / the process of operating
connect	……	connection	……
manage	……	management	……
control	……	controller	……
design	……	designer	……

4. Collocations in Engineering

Engineers often use words together in fixed combinations called **collocations**.

☞ **Task 3:** Match the words in Column A with their common collocations in Column B.

Column A	Column B
conduct	(a) experiment
write	(b) a report

Column A	Column B
give	(c) a presentation
perform	(d) calculations
analyze	(e) data

5. Speaking Practice

Work in pairs. Choose one of the collocations above and create a short role-play. Example:

- A student asks their classmate: *"Have you finished writing the report for our lab experiment?"*
- .....
- .....
- .....
- .....

Part D – Grammar Focus: Formal vs. Informal Structures

1. Introduction

Grammar is not only about correct sentences. In academic and professional communication, grammar helps us **choose the right level of formality**. The same idea can be expressed in a casual or in a formal/professional way.

2. Comparing Formal and Informal Grammar

Look at the following examples:

Informal Expression	Formal/Professional Expression
"I can't come coz I'm busy."	"I am unable to attend because I am busy."
"Can you give me the notes?"	"Could you please provide me with the notes?"
"I'll send it later."	"I will submit it this afternoon."
"Yeah, no problem."	"Certainly, that will not be a problem."
"Gonna finish the report soon."	"I am going to finish the report shortly."

☞ **Observation:** Formal structures often use:

- **Full forms** (cannot vs. can't, will not vs. won't).
- **Polite modal verbs** (could, would).
- **Complete sentences** without slang or contractions.

3. Practice A: Identify Formality

Decide whether the following sentences are **informal (I)** or **formal (F)**:

1. "Sorry, I can't meet you tomorrow."
2. "I regret that I am unable to attend the meeting tomorrow."
3. "Could you send me the report, please?"
4. "Gimme a sec, I'll do it."
5. "We will analyze the data next week."

4. Practice B: Transform Informal into Formal

Rewrite the following informal sentences in a **formal/professional** way.

1. "Hey prof, I can't come today."
2. "Can u check my report?"
3. "I'm gonna need more time to finish the project."
4. "Yeah, sure, no worries."
5. "I'll send it to u later."

5. Grammar Focus: Modal Verbs in Professional Communication

Politeness in professional English often uses **modal verbs**.

- **Can** → less formal: *"Can you send me the file?"*
- **Could** → more formal: *"Could you send me the file, please?"*
- **May** → very formal: *"May I request the file from you?"*
- **Would** → polite request: *"Would you be able to send me the file?"*

☞ **Task:** Rewrite these sentences using a more formal modal verb:

1. Can I ask you a question?
2. Can you explain this formula?
3. Can I borrow your notes?

6. Writing Practice

Write two short versions of the same message:

1. One **informal** (to a friend).
2. One **formal** (to a professor or manager).

Topic: Asking for help with a project.

7. Reflection

Think of a real situation in which you sent an email, text, or message in English. Was it formal or informal? Did you choose the correct level of grammar? How could you improve it? Write 5–6 sentences.

Part E – Writing Practice: Professional Emails

1. Introduction

Writing professional emails is one of the most important skills for engineering students. Clear and polite emails help you communicate with professors, colleagues, and future employers. In this section, you will learn the **structure of a professional email** and practice writing your own.

2. Structure of a Professional Email

A well-written email usually has **four parts**:

1. **Greeting** → "Dear Professor Ali," / "Dear Sir or Madam,"
2. **Introduction & Purpose** → "I am writing to ask about …"
3. **Main Message** → Clear, short, polite information (2–3 sentences)
4. **Closing & Signature** → "Thank you for your time. Sincerely, Ahmed Khaled"

3. Example Email (Good Model)

Subject: Request for Lecture Notes

Dear Professor Ahmed,

I hope this email finds you well. I am writing to inform you that I was unable to attend class yesterday due to illness. Could you kindly share the lecture notes or let me know how I can obtain them?

Thank you very much for your support.

Sincerely,

Mariam Hassan

4. Bad vs. Good Email

Compare the two emails. What is wrong with the first one?

Bad Example:

hi prof,

i was sick. plz send me notes. thx.

Good Example:

Dear Professor,

I was unable to attend class yesterday due to illness. Could you please advise me on how I can access the notes?

Thank you for your help.

Best regards,

Sara

☞ **Task 1:** Underline the errors in the "Bad Example" and explain why they are inappropriate.

5. Practice A: Complete the Email

Fill in the blanks to complete this email:

Dear Professor,

I am writing to _____ you about the project deadline. Could you please _____ if we can submit it next Monday instead of Friday?

Thank you for your _____.

Best regards,

Omar

6. Practice B: Write Your Own Email

Write an email (80–100 words) to your professor:

- Situation: You need an extension for your lab report.
- Include all four parts (greeting, introduction, main message, closing).

7. Peer Review

Exchange your email with a classmate. Check:

- Is the tone polite?
- Are all four parts included?
- Is the grammar and spelling correct?

8. Reflection

Think about how email writing differs from messaging apps (WhatsApp, Messenger, etc.). Why is formality important in professional contexts? Write 4–5 sentences.

Part F – Speaking & Listening: Presentations & Role-Plays

1. Introduction

Engineers often need to **speak clearly and confidently** in professional situations—such as giving a presentation, reporting project results, or discussing technical problems. In this section, you will practice **listening to professional speech** and **speaking in formal contexts**.

2. Listening Activity: Mini-Presentation

Listen to the following short talk (teacher reads aloud in class).

Transcript:

"Good morning, everyone. Today I will briefly explain our group's project. Our aim was to design a lightweight bridge using recycled materials. First, we researched existing designs. Next, we created a 3D model and tested it under different loads. Finally, we presented our results. We found that recycled steel and plastic can reduce costs by 20%. Thank you."

☞ **Task 1:** Answer the questions:

1. What was the project about?
2. What were the three steps of the project?
3. What was the final result?

3. Speaking Practice: Mini-Presentation

Prepare a short **2-minute presentation** about one of the following topics:

- Your favorite subject in engineering.
- A recent project or experiment you did.
- How teamwork helps engineers solve problems.

Structure your talk:

1. Greeting → "Good morning…"
2. Purpose → "Today I will talk about …"
3. Main points (2–3 ideas)
4. Conclusion → "Thank you for listening."

4. Role-Play 1: Formal vs. Informal

Work in pairs. Role-play the situation in **both casual and professional styles**.

Situation: You missed a lab session and need your friend/professor to explain the experiment.

- **Casual version** → "Hey, I missed lab. What happened?"
- **Professional version** → "Good afternoon, Professor. Unfortunately, I was absent from the lab yesterday. Could you please let me know how I can catch up?"

☞ **Task 2:** Perform both versions with your partner. Discuss which one is more suitable in an academic setting.

5. Role-Play 2: Meeting Discussion

Work in groups of three. Imagine you are engineers discussing a problem: *The project is delayed because some materials arrived late.*

- Student A = Team Leader (formal role)
- Student B = Engineer reporting the problem
- Student C = Engineer suggesting a solution

Example Expressions:

- "The main issue we are facing is …"
- "Could we try another supplier?"

- “I suggest extending the deadline by one week.”

6. Pronunciation Focus: Politeness Markers

Practice saying these polite phrases clearly:

- “Could you please repeat that?”
- “Would you mind explaining this point again?”
- “I would appreciate your advice.”
- “Thank you for your time.”

👉 **Task 3:** Repeat after your teacher, then practice with a partner.

7. Reflection

Think about your speaking style in English. Do you usually sound casual, formal, or somewhere in between? Write 3–4 sentences about how you can improve your **professional speaking skills**.

Part G – Unit Review & Answer Key

🔎 1. Review Checklist

Before moving on, check if you can do the following:

✔ Distinguish between casual and professional communication.

✔ Read and understand a short article about email communication.

✔ Use technical terms correctly in sentences.

✔ Write polite, well-structured emails.

✔ Transform informal grammar into formal grammar.

✓ Give a short professional presentation.

✓ Role-play formal discussions in engineering contexts.

If you can do all these, you are ready for the next unit!

📝 2. Review Activities

Activity 1: Spot the Mistakes

Read the email below. Rewrite it in a **professional style**.

hi sir,

i was busy n cudnt finish project. plz gimme 2 more days. thx.

Activity 2: Vocabulary Quiz

Fill in the blanks with the correct words: **load, stress, circuit, current, power**.

1. The _____ in this material is too high and may cause failure.
2. The bridge can carry a heavy _____.
3. The electric _____ is measured in amperes.
4. The company generates solar _____.
5. A short _____ can damage the entire system.

Activity 3: Grammar Transformation

Rewrite these sentences in **formal English**:

1. “I can’t come coz I’m busy.”
2. “Gimme the report later.”
3. “Yeah, I’ll do it tmrw.”

Activity 4: Speaking Task

With a partner, prepare a **1-minute professional conversation**:

- Situation: You need to request extra time for a project.
- Use at least 2 polite modal verbs (*could, would, may*).

Activity 5: Writing Task

Write a short **professional email (80–100 words)**:

- Topic: Ask your professor about missing a class due to illness.
- Include greeting, purpose, message, and closing.

Unit 3: Technical Reading & Research Skills

Unit Goals (Weeks 5–6):

By the end of this unit, students will be able to:

- Read and understand short **technical texts** related to engineering.
- Use **reading strategies** (skimming, scanning, detailed reading).

- Recognize and use **signal words** (first, however, therefore, as a result).
- Summarize technical information in their own words.
- Practice grammar: **Passive Voice in Technical Writing**.
- Develop skills in writing **short summaries and abstracts**.
- Engage in speaking activities about research topics.

Part A – Warm-Up: How Do Engineers Read?

1. Introduction

Reading in engineering is not the same as reading a storybook. Engineers read **for information**, to solve problems, or to learn about new technology. Before we start, let's think about how we read different kinds of texts.

2. Discussion Questions

1. What do you usually read in your daily life (news, social media, books, etc.)?
2. Do you read technical materials (manuals, reports, scientific articles)? How is it different?
3. Why is reading an important skill for engineering students?

3. Activity: Two Styles of Reading

Read the two short texts below. Which one requires **skimming** (quick overview) and which one requires **detailed reading**?

Text A (from a newspaper):

"Electric cars are becoming more popular worldwide. Governments are supporting them to reduce pollution."

Text B (from an engineering manual):

"To connect the motor, first attach the red wire to terminal A. Then, secure the black wire to terminal B. Check that all screws are tight before starting."

☞ **Task 1:** Write "Skimming" or "Detailed Reading" next to each text.

4. Quick Reading Challenge

Read the following short paragraph in **30 seconds**. Then cover it and answer the question.

Paragraph:

"Solar panels convert sunlight into electricity through photovoltaic cells. They work best when placed in direct sunlight and at an angle that maximizes exposure. Engineers test different materials to improve efficiency."

☞ **Question:** What do engineers test to improve solar panel efficiency?

5. Reflection

Think about your own reading habits. Do you read quickly for general ideas or slowly for details? How can you improve your **technical reading skills**? Write 3–4 sentences.

Part B – Reading

- Reading Passage

The Role of Materials in Engineering

Engineers design and build products that solve real-world problems. One of the most important decisions an engineer makes is selecting the right material. Materials such as steel, aluminum, concrete, and plastics are used in construction, transportation, and manufacturing. Each material has specific properties that make it suitable for a particular purpose.

For example, steel is strong and durable, so it is often used in bridges and skyscrapers. Aluminum is lightweight and resistant to corrosion, which makes it popular in aircraft design. Concrete is inexpensive and widely available, so it is common in building foundations. Plastics are flexible and can be molded into many shapes, making them useful in electronics and household products.

When engineers choose a material, they must consider cost, strength, durability, safety, and environmental impact. Selecting the wrong material can cause serious problems, such as product failure or even accidents. Therefore, material selection is a critical step in the engineering design process.

Vocabulary Focus

Match the words with their meanings:

1. **Durable**
2. **Corrosion**
3. **Foundation**
4. **Flexible**
5. **Impact**

a. Base of a structure

b. The effect or influence of something

c. Able to bend without breaking

d. Lasting for a long time without damage

e. Slow destruction caused by chemical reaction (often rust)

Comprehension Questions

1. What is one of the most important decisions engineers must make?
2. Why is steel used in bridges?
3. What makes aluminum useful in aircraft design?
4. Why is plastic considered flexible?
5. What can happen if engineers choose the wrong material?

Critical Thinking

- Do you think cost or safety is more important when choosing a material? Why?
- Can you give an example of a material commonly used in your daily life? What are its properties?

Reading Skills Practice: Identifying Main Ideas

Look at the sentences below. Decide if they express the **main idea (M)** or a **supporting detail (S)**.

1. Engineers must select the right material for their designs.
2. Steel is used in bridges because it is strong.
3. Aluminum is resistant to corrosion.
4. Choosing the wrong material may cause accidents.

5. Engineers also consider cost and environmental impact.

Part C – Vocabulary & Language Development

1. Grammar Focus: The Passive Voice

Engineers often use the **passive voice** in reports and technical writing because:

- The action is more important than the person doing it.
- It makes the text more formal and objective.

Structure

☞ be + past participle (+ by …)

Examples:

- *Active:* Engineers build bridges.
- *Passive:* Bridges **are built** by engineers.
- *Active:* The team designed the experiment.
- *Passive:* The experiment **was designed** by the team.

Usage in Engineering Contexts

- *The bridge was constructed in 2010.*
- *The new system is tested every week.*
- *Safety rules must be followed at all times.*

📝 Practice 1 – Change to Passive Voice

Rewrite the sentences in the passive voice.

1. Engineers use steel to build skyscrapers.
2. The team will test the new machine tomorrow.

3. Students designed a robot for the competition.
4. People recycle plastics for environmental reasons.
5. Technicians must follow safety instructions.

2. Vocabulary in Context

Key Engineering Verbs in Passive Voice

- design → *was designed*
- test → *was tested*
- build → *is built*
- develop → *was developed*
- install → *is installed*

Fill in the blanks with the correct passive form:

1. The new engine _____ (design) by a team of young engineers.
2. A modern highway _____ (build) in the city last year.
3. Solar panels _____ (install) on the roof to reduce energy costs.
4. The safety system _____ (test) before the factory opened.
5. A new app _____ (develop) to monitor electricity usage.

3. Linking Words in Academic Writing

Linking words help connect ideas logically.

Category	Linking Words / Phrases	Punctuation Rules	Example Sentence
Addition	moreover, furthermore, in addition, also, besides	Usually followed by a **comma** when starting a sentence. When used in mid-sentence, often set	*The method is simple; moreover, it is effective.*

Category	Linking Words / Phrases	Punctuation Rules	Example Sentence
		off with **commas**.	
Contrast	however, on the other hand, nevertheless, nonetheless, conversely, instead	When at the beginning, use a **comma** after. When inside a sentence, surround with **commas**. Often preceded by a **semicolon** if joining two clauses.	*The design is costly; however, it ensures safety.*
Comparison (Similarity)	similarly, likewise, in the same way	Comma after if at sentence start. Often joins two related sentences.	*The bridge was built quickly; similarly, the tunnel was completed on time.*
Cause / Effect	therefore, thus, hence, consequently, accordingly, as a result	Preceded by a **semicolon** if linking clauses. Comma usually follows.	*The system failed; therefore, a backup was activated.*
Reason (Cause)	because, since, due to, owing to, as	Do **not** use a comma if the clause follows the main clause. Use a comma if the reason clause comes first.	*The project stopped because funding ended.* / *Because funding ended, the project stopped.*
Sequence / Order	first, firstly, next, then, after that, finally, lastly, subsequently	Use a **comma** after the linking word when it starts a sentence.	*First, the materials were tested. Then, the prototype was built.*
Clarification / Emphasis	in fact, indeed, in other words, that is to say, to put it another way, especially, particularly	Usually set off with **commas**.	*The results were clear; in fact, they confirmed the hypothesis.*
Example / Illustration	for example, for instance, such as, namely, specifically, in particular, to illustrate	Use a **comma** after *for example* or *for instance*. *Such as* usually has **no comma before it** unless it is non-restrictive.	*Many materials, for example, steel and aluminum, were tested.*
Conclusion / Summary	in conclusion, to sum up, in summary, overall, in brief, in short, all in all	Comma follows when at the start. Can also appear mid-sentence, set off with commas.	*In conclusion, the experiment was successful.*
Condition / Hypothesis	if, unless, provided that, as long as, in case, on condition that, whether or not	If clause comes first, use a **comma** before the main clause. If it comes second, **no comma**.	*If the sensor fails, the system will shut down.* / *The system will shut down if the sensor fails.*

📝 Practice 2 – Insert Linking Words

Choose the correct linking word for each blank.

1. Concrete is inexpensive; _____, it is widely used in construction.
2. Steel is strong. _____, it is heavy and expensive.
3. The test was repeated twice. _____, the results were more reliable.
4. _____, the team prepared the materials. Then, they started the experiment.

---

4. Short Writing Task

Task: Rewrite the following short report using the **passive voice** and **linking words**.

Active Version:

"Engineers designed a new bridge. They used steel and concrete. They finished it in 2020. People use the bridge every day. It connects two cities. It reduces travel time."

Model Passive + Linking Version:

*A new bridge **was designed** by engineers. Steel and concrete **were used** in its construction. It **was finished** in 2020. The bridge **is used** every day. It connects two cities; **as a result**, it reduces travel time.*

Part D – Writing Skills

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1. Paragraph Writing in Engineering

An **academic paragraph** should have:

1. **Topic Sentence** – introduces the main idea.
2. **Supporting Details** – explanations, facts, or examples.
3. **Concluding Sentence** – summarizes or links to the next idea.

Example Paragraph

Concrete is one of the most important materials in engineering. It is inexpensive, durable, and widely available. Engineers use it in building foundations, roads, and bridges. In addition, concrete can resist heavy loads and weather conditions. For these reasons, it is considered a fundamental material in construction projects.

📝 Practice 1 – Identify Parts of a Paragraph

Underline the **topic sentence**, circle the **supporting details**, and box the **concluding sentence** in the example above.

🔹 2. Writing Cohesive Sentences

Use **linking words** to connect ideas:

- *Aluminum is lightweight. Therefore, it is used in aircraft design.*
- *Steel is strong; however, it is heavy.*

Practice 2 – Combine Sentences

1. Engineers tested the new robot. The results were positive.
2. The machine is expensive. It is very efficient.
3. Solar panels produce energy. They reduce electricity bills.

🔹 3. Short Report Structure

Engineering reports usually include:

- **Title**
- **Introduction** (purpose)

- **Method** (what was done)
- **Results** (findings)
- **Conclusion** (what it means)

Example: Mini-Report

Title: Testing the Strength of Concrete

Introduction:

This report describes an experiment to test the strength of concrete.

Method:

Concrete samples were prepared and tested under pressure.

Results:

The samples resisted up to 50 MPa of pressure.

Conclusion:

Concrete shows strong resistance, and it is suitable for construction projects requiring durability.

Practice 3 – Reorder Sentences

Put the sentences below into the correct report order:

a. The purpose of this report is to evaluate a new solar panel.

b. The solar panel produced 20% more energy than traditional panels.

c. A new solar panel was tested under laboratory conditions.

d. The results show the solar panel is efficient and environmentally friendly.

e. Report on Solar Panel Efficiency.

4. Writing Task

Task: Write a short report (120–150 words) on one of the following:

- A material commonly used in construction (e.g., steel, concrete, glass).
- A machine or device you studied in your engineering class.

Guidelines:

- Use **passive voice** (e.g., *The experiment was conducted…*).
- Use **linking words** (e.g., *therefore, however, as a result*).
- Organize into **Introduction, Method, Results, Conclusion**.

Part E – Speaking & Listening

1. Speaking: Discussing Materials

Activity 1 – Pair Work

Discuss these questions with a partner:

1. Which material is most important in engineering: steel, concrete, aluminum, or plastic? Why?
2. Can you give an example of an engineering project in your country that uses these materials?
3. How does cost influence the choice of material?

Activity 2 – Mini-Presentation

Prepare a **1-minute talk** on one material of your choice. Include:

- Properties
- Common uses

- Advantages and disadvantages

Tip: Use linking words for fluency (*first, next, in addition, however, therefore*).

2. Listening: Engineering Reports

Listening Transcript (Teacher Reads Aloud / Audio Provided):

"This report describes the testing of a new type of lightweight concrete. The samples were prepared in the laboratory. Then, they were tested for strength and durability. The results showed that the concrete resisted high pressure but absorbed more water than traditional concrete. Therefore, it is suitable for walls but not for foundations."

Listening Comprehension Questions

1. What material was tested?
2. Where were the samples prepared?
3. What two properties were tested?
4. What was the result of the test?
5. Why is the material not suitable for foundations?

3. Role-Play Activity

Scenario: You are engineers in a team meeting. You must decide which material to use for a new bridge: **steel** or **aluminum**.

- Student A: Argue for **steel** (strong, durable, widely available).
- Student B: Argue for **aluminum** (lightweight, corrosion-resistant, modern).

Task: Have a short debate (2–3 minutes). Use expressions like:

- *In my opinion…*
- *The advantage of … is…*
- *However, we must also consider…*
- *Therefore, I think the best choice is…*

4. Pronunciation Focus: Stress in Technical Words

Practice saying these words with correct stress. The stressed syllable is in **bold**.

- en**gi**neer
- con**crete**
- a**lum**inum
- e**lec**trical
- com**pu**ter

☞ Students repeat after the teacher, then practice in pairs.

5. Speaking Task – Report Summary

Work in pairs. Read the short mini-report below and summarize it orally in your own words.

Mini-Report:

"A new bridge was tested for safety. The test included checking the strength of the steel and the stability of the structure. The results showed the bridge is safe for use. It will open to the public next month."

Part F – Review & Consolidation

1. Unit Summary

In this unit, you learned how to:

- Read and analyze short technical texts.
- Identify main ideas and supporting details.
- Use the **passive voice** in academic and technical writing.
- Connect ideas with **linking words** (however, therefore, as a result…).
- Write short **paragraphs** and **mini-reports**.
- Discuss and summarize engineering information in speaking tasks.

2. Review Vocabulary Quiz

Match the words with their definitions:

1. **Durable**
2. **Corrosion**
3. **Foundation**
4. **Flexible**
5. **Efficient**

a. Base of a building or structure

b. Works well with little waste of time/energy

c. Able to bend without breaking

d. Long-lasting, not easily damaged

e. Slow damage caused by chemical reaction

3. Grammar Review – Passive Voice

Rewrite the sentences in passive voice:

1. Engineers tested the new software yesterday.
2. The company will build a new research lab.
3. Students prepared a presentation on robotics.

4. Mixed Skills Exercise

Read the short text and complete the tasks.

Text:

"A new water filter was designed to improve drinking water quality. It was tested in a laboratory and in several households. The results showed the filter removed 90% of harmful substances. As a result, it is recommended for use in rural areas."

Tasks:

a. Identify the main idea.

b. Find 2 supporting details.

c. Rewrite the conclusion using your own words.

5. Final Project Task

Task: Write a short technical report (150–180 words) about **a machine, device, or material** from your engineering field.

Guidelines:

- Use **passive voice** (e.g., *The system was tested…*).
- Use at least **three linking words**.

- Organize your report into **Introduction, Method, Results, Conclusion**.
- Be clear and concise.

6. Self-Reflection

Answer the following:

1. Which skill from this unit do you feel most confident about?
2. Which skill do you need to practice more (reading, writing, speaking, or grammar)?
3. How will you use these skills in your engineering studies?

Unit 4: Presentations & Technical Communication

Unit Objectives

By the end of this unit, students will be able to:

- Prepare and deliver short technical presentations.
- Use academic and technical vocabulary for describing processes, charts, and data.

- Organize presentations with clear introductions, bodies, and conclusions.
- Improve pronunciation, intonation, and body language in speaking.
- Write effective presentation notes and visual aids.

Part A – Warm-Up & Introduction

Discussion Questions

1. Have you ever given a presentation before? How did you feel?
2. What makes a presentation interesting or boring?
3. Do you prefer speaking freely or reading from notes? Why?

Mini-Reading: *"Why Engineers Need Presentation Skills"*

Engineers often present their work to classmates, teachers, or colleagues. Good presentation skills help them explain complex ideas clearly. Engineers also present project results to managers or clients. Strong communication makes technical information easy to understand, which increases the chance of success.

Quick Check

1. Who do engineers present their work to?
2. Why are presentation skills important?

Vocabulary Preview

Match the words with their meanings:

1. Audience

2. Visual aid
3. Confidence
4. Body language
5. Project

a. Pictures, slides, or charts used in a presentation

b. The group of people listening

c. Physical movements that show feelings

d. Trust in yourself

e. A planned piece of work or study

🎧 Part B – Listening & Speaking Practice

1. Model Mini-Presentation (Transcript)

Topic: *Solar Energy in Modern Engineering*

"Good morning everyone. Today, I will talk about solar energy in engineering. First, I will explain why solar energy is important. Then, I will describe how solar panels work. Finally, I will discuss some advantages and challenges.

Solar energy is important because it is clean and renewable. Unlike oil or coal, it does not produce harmful gases. Solar panels work by converting sunlight into electricity. They are usually installed on rooftops or open land.

One advantage of solar energy is that it reduces electricity bills. Another benefit is that it helps protect the environment. However, solar panels are expensive, and they only work when there is sunlight.

In conclusion, solar energy is a promising solution for the future, but we need to find ways to make it cheaper and more efficient. Thank you for listening."

2. Listening Comprehension Questions

1. What three points does the speaker cover?
2. Why is solar energy important?
3. How do solar panels work?
4. What are two advantages of solar energy?
5. What is one challenge of using solar panels?

3. Presentation Language Focus

Useful expressions for presentations:

- **Opening:** *Good morning… Today I will talk about…*
- **Sequencing:** *First… Then… Next… Finally…*
- **Adding information:** *In addition… Another point is…*
- **Contrast:** *However… On the other hand…*
- **Concluding:** *In conclusion… To sum up… Thank you for listening.*

4. Speaking Practice – Pair Activity

Choose one of the topics and prepare a **1-minute mini-presentation** with your partner. Use the expressions above.

Topics:

1. A famous bridge or building in your country

2. A machine or device you studied in class
3. The role of computers in engineering

☞ Deliver your mini-presentation to your partner. Your partner should ask **one question** at the end.

5. Pronunciation & Intonation Practice

Read the following sentences aloud. Stress the words in **bold** and use rising/falling intonation.

1. *Good **morning** everyone.*
2. *Today I will talk about **solar energy**.*
3. *First, I will explain **how it works**.*
4. *However, it is **very expensive**.*
5. *In conclusion, thank you for **listening**.*

Part C – Reading

Reading Focus: Understanding Technical Articles

Engineers often need to read **technical texts** such as manuals, reports, or research summaries.

Reading requires:

- Identifying **main ideas**.
- Recognizing **technical vocabulary** in context.
- Summarizing **key information** clearly.

1. Pre-Reading Discussion

Discuss with a partner or write short answers:

1. What technical texts have you read in English before (manuals, reports, research)?
2. Why is it important for engineers to read in English?
3. What strategies can help you understand difficult texts?

2. Reading Passage

Title: Communication in Engineering Projects

Effective communication is essential in all engineering projects. Large projects often involve engineers from different countries and disciplines. If communication fails, the whole project may suffer delays or errors.

One important skill is the ability to write clear technical reports. Reports must be objective, precise, and easy to follow. Engineers often use diagrams, tables, and figures to support their explanations. In addition, reports are usually written in the passive voice, because the focus is on the process, not the person.

Another key aspect is teamwork communication. Engineers must share ideas, solve problems together, and coordinate their tasks. This requires not only technical knowledge but also soft skills such as active listening and giving constructive feedback.

Finally, communication with the public is also important. Engineers need to explain complex technical information in simple language so that non-specialists can understand. Good communication therefore connects technical expertise with real-world application.

3. Comprehension Questions

Answer the questions in complete sentences.

1. Why is communication important in engineering projects?

.....

2. What are two features of good technical reports?

.....

3. Why is the passive voice often used in engineering writing?

.....

4. Besides technical skills, what soft skills are important for engineers?

.....

5. Why do engineers need to explain information to the public?

.....

4. Vocabulary in Context

Match the words with their meanings:

Word	Meaning
objective	a) to make something easier to understand
precise	b) not influenced by personal feelings
figures	c) accurate and exact
coordinate	d) numbers, charts, or diagrams used in reports
simplify	e) to organize or manage different tasks

5. Practice – Sentence Completion

Fill in the blanks with the correct vocabulary word.

1. The engineer gave an _____ explanation, based only on facts.
2. Instructions must be _____ so that no mistakes happen.

3. The report included several tables and _____ to support the data.
4. The project manager will _____ the work of the different teams.
5. Complex theories should be _____ when speaking to the public.

6. Post-Reading Task – Summarizing

Write a short summary (60–80 words) of the text "Communication in Engineering Projects."

- Use your own words.
- Include the **three main areas of communication** mentioned in the passage.

Reading Text 1 – Engineers and Communication

Engineers are often seen as problem-solvers and builders of technology. However, communication is just as important as technical skill.

In every engineering field, professionals need to write reports, explain designs, give presentations, and collaborate with international teams. A bridge design or a new machine can only be successful if others understand how it works.

Technical communication is different from everyday conversation. It requires precision, clarity, and the use of specific vocabulary. For example, an engineer will not simply say *"the system is broken."* Instead, they may write *"the circuit failed due to overheating in the transformer."*

Good communication also saves time and money. A poorly written instruction manual may cause mistakes in using equipment, leading to delays or even accidents. On the other hand, clear diagrams and step-by-step explanations allow users to operate machines safely and efficiently.

In conclusion, engineers communicate not only with machines but also with people. **Strong communication skills are as essential as technical knowledge for success in engineering.**

Comprehension Check

Task A – True or False

Read the text and mark T (True) or F (False).

1. Engineers only need technical skills, not communication skills.
2. Technical communication requires accuracy and clarity.
3. Poor communication can lead to accidents.
4. Engineers communicate only with machines.

Task B – Short Answer

Answer in complete sentences.

1. Why is communication important in engineering?
2. How is technical communication different from casual conversation?
3. What problems can result from unclear instructions?

Task C – Vocabulary in Context

Find words in the text with these meanings:

1. Working together with others (para. 1) → _____
2. Exactness, correctness (para. 2) → _____
3. Delay or interruption of progress (para. 3) → _____
4. Essential, very important (para. 4) → _____

Reading Text 2 – Case Study: The Tacoma Narrows Bridge

In 1940, engineers built the Tacoma Narrows Bridge in Washington State, USA. The bridge was very flexible and elegant. However, only four months after opening, it collapsed due to strong winds.

A later investigation showed that **the design did not properly communicate the risks of wind forces**. Engineers used complex calculations but failed to explain the potential dangers clearly to decision-makers. As a result, the bridge became unstable and unsafe.

The Tacoma Narrows disaster is now taught in engineering schools as an example of how poor communication can lead to failure. Engineers learned that **explaining risks in simple, understandable language is as important as the technical design itself.**

Comprehension Check

Task D – Multiple Choice

1. When was the Tacoma Narrows Bridge built?

   a) 1920

   b) 1940

   c) 1960

   d) 1980

2. Why did the bridge collapse?

   a) Earthquake

   b) Strong winds

   c) Heavy traffic

   d) Fire

3. What was the main communication problem?

   a) Engineers used simple explanations.

   b) Engineers failed to explain risks clearly.

   c) The public ignored instructions.

   d) Builders used the wrong materials.

Task E – Critical Thinking

1. What lesson can engineers learn from the Tacoma Narrows Bridge collapse?
2. In your opinion, how can engineers communicate risks more clearly today?

Part D – Grammar Focus

Grammar Focus: The Passive Voice in Technical Writing

Engineers often need to describe **processes, experiments, and designs** in an **objective way**.

Instead of saying *"We tested the material,"* technical writing often prefers the passive form:

"The material was tested."

This focuses on the **process** or **result**, not the person.

1. Forming the Passive

The passive is formed with:

Subject + be (in correct tense) + past participle (V3).

Examples in engineering contexts:

- Present simple: *Steel is used in construction.*
- Past simple: *The bridge was designed in 2018.*
- Present continuous: *New sensors are being installed.*

- Present perfect: *The device has been tested successfully.*

2. Why Use the Passive in Engineering?

- To emphasize **processes** rather than people.
- To make reports more **formal and objective**.
- To describe steps in experiments and procedures.

3. Passive vs. Active

Active Sentence	**Passive Sentence**	**Why Passive?**
The engineers built the dam.	The dam was built (by engineers).	Focus on the dam, not the engineers.
We tested the material.	The material was tested.	Emphasis on the test, not "we."
The team will design the bridge.	The bridge will be designed.	Highlights the project outcome.

4. Practice A – Identify

Underline the passive verbs in the sentences below:

1. The machine was repaired yesterday.
2. New software is being developed for the system.
3. The laboratory assistant prepared the samples.
4. The results have been checked twice.

5. Practice B – Rewrite

Rewrite the active sentences in passive form.

1. The engineers measured the voltage.
2. The company will produce 1000 microchips.
3. They are installing new turbines.
4. We have completed the design.

6. Practice C – Fill in the blanks

Complete the sentences with the correct passive form:

1. The test _____ (carry out) in controlled conditions.
2. New materials _____ (develop) every year.
3. The circuit diagram _____ (not complete) yet.
4. Instructions _____ (give) before the experiment starts.

7. Grammar in Use – Mini Writing Task

Write 5 sentences describing a **technical process** in passive voice.

Example: *The data was collected by the sensors.*

Part G – Writing Task: Lab Report / Process Description

Writing Focus: Lab Reports & Process Descriptions

In engineering, students are often required to write **lab reports** and **process descriptions**. These should be **clear, precise, and objective**.

A good lab report or process description includes:

1. **Title** – What was tested or described.
2. **Introduction/Purpose** – Why the experiment or process is important.
3. **Materials/Equipment** – What tools were used.
4. **Procedure/Process** – How the test or process was carried out (usually in **passive voice**).
5. **Results/Observations** – What was found.
6. **Conclusion** – The outcome or significance.

1. Model Example (Process Description)

Title: Water Filtration Process

Introduction: This process shows how clean water is obtained from natural sources.

Materials: Filter tank, gravel, sand, activated carbon, pipes.

Procedure:

1. Water is collected from the source.
2. Large particles are removed through sedimentation.
3. The water is passed through layers of gravel and sand.
4. Activated carbon is used to remove impurities.
5. Finally, the clean water is stored in tanks.

Conclusion: The process ensures safe and clean water for use.

2. Key Writing Features

- Use **passive voice**: *"The sample was heated,"* not *"We heated the sample."*
- Use **sequence words**: *first, then, next, after that, finally.*
- Keep language **concise and factual**.

3. Practice A – Reordering

Put the steps of this process in the correct order:

Process: *Producing Electricity from Wind Turbines*

a. Electricity is transferred to the grid.

b. Blades are turned by the wind.

c. The generator converts mechanical energy into electrical energy.

d. The rotor spins a shaft inside the generator.

4. Practice B – Fill in the Gaps

Complete the process description with the correct passive forms:

Title: Making Concrete

1. Cement, sand, and gravel _____ (mix) together.
2. Water _____ (add).
3. The mixture _____ (pour) into molds.
4. The blocks _____ (leave) to dry and harden.

5. Practice C – Mini Writing Task

Write a short **lab report (100–120 words)** on one of these topics:

- Measuring the resistance of a wire.
- Testing the strength of materials.
- Simple water purification.

Use **passive voice** and include **at least 5 steps**.

Exercises

A. Vocabulary Practice

1. Matching

Match the technical communication terms with their meanings:

a) Precision

b) Collaborate

c) Diagram

d) Instruction

e) Efficiency

1. Work together with others.
2. Clear drawing showing how something works.
3. The quality of being exact and correct.
4. A step-by-step guide to do something.
5. Achieving results without waste of time/energy.

2. Fill in the blanks

Use the words *accuracy, report, device, process, essential* to complete the sentences.

1. Engineers must write a detailed _____ after finishing an experiment.
2. The mobile phone is an electronic _____.
3. Safety is _____ in all engineering projects.
4. The new water filter improves the cleaning _____.
5. The calculation must be done with great _____.

B. Reading Comprehension

Text: (From Part B – Engineers and Communication)

Task 1 – True or False

1. Engineers only communicate with machines.
2. Poor communication can cause accidents.
3. Technical communication is the same as everyday conversation.
4. Clear diagrams can save time.

Task 2 – Short Answer

1. Why do engineers need strong communication skills?
2. Give one example of a technical communication difference from normal speech.
3. How can poor communication waste money?

C. Grammar Focus – Passive Voice

1. Rewrite into passive

1. The engineers tested the new bridge.
2. The company will build a new factory.
3. We are designing the new software.
4. They have completed the project.

2. Fill in the blanks

1. The material _____ (test) yesterday.
2. The instructions _____ (give) before the experiment started.
3. New systems _____ (develop) every year.

4. The machine _____ (repair) last week.

D. Listening Practice

(Teacher provides audio, or read aloud)

Script (short version):

"During engineering projects, communication is key. Engineers must explain technical details clearly. They often use reports, diagrams, and presentations. If instructions are not precise, mistakes can occur. Good communication ensures safety, efficiency, and success."

Task – Complete the notes

1. Engineers must explain _____ clearly.
2. They use reports, _____, and _____.
3. If instructions are not precise, _____ can occur.
4. Good communication ensures _____ and _____.

E. Writing Practice

Task – Short Lab Report (100–120 words)

Write a report on *Testing the Strength of Materials*. Include:

- Title
- Purpose
- Materials
- Procedure (5 steps in passive voice)
- Conclusion

F. Speaking Practice (Pair/Group Work)

Role-Play 1:

Student A = Engineer explaining a new machine.

Student B = Manager asking for a simple explanation.

Role-Play 2:

Work in pairs. Describe the process of *making electricity from wind turbines*. Use sequence words: *first, then, after that, finally.*

Part H – Review & Self-Assessment Project

1. Review Quiz

A. Vocabulary

Fill in the blanks with the correct word: *efficiency, collaborate, essential, precision, instruction.*

1. Engineers must work together and _____ on complex projects.
2. Safety is _____ in any design.
3. The diagram must be drawn with great _____.
4. Good communication improves project _____.
5. Clear _____ help users operate machines correctly.

B. Grammar – Passive Voice

Rewrite the sentences in the passive:

1. The engineers built the dam.
2. They will test the new engine tomorrow.

3. The company is installing new software.

C. Reading – Quick Check

Read this short passage:

"In many engineering failures, the problem is not the design itself but the lack of communication. Engineers must explain risks clearly to managers and the public. Simple language and clear diagrams are essential to avoid misunderstanding."

Questions:

1. What is often the real cause of engineering failures?
2. Who should engineers explain risks to?
3. Which two tools are important to avoid misunderstanding?

2. Self-Assessment Checklist

Tick (✔) what you can now do after Unit 3:

Skill	Yes	No	Need Practice
I can use engineering vocabulary accurately.			
I can identify main ideas in a technical text.			
I can write a short lab report in passive voice.			
I can describe a process clearly, step by step.			
I can explain risks and technical details in simple English.			

3. Unit Project – Group Presentation

Task: In groups of 3–4, prepare a short presentation (5–7 minutes) on a **real engineering process or system**. Examples:

- How a solar panel generates electricity
- How clean water is produced in a filtration system
- How traffic lights work

Instructions:

1. Use **at least 5 passive voice sentences**.
2. Include a **diagram** to explain the process.
3. Use **sequence words** (first, then, after that, finally).
4. Each member must speak for at least 1 minute.
5. End with a short **Q&A session** with classmates.

4. Reflection Journal (Homework)

Write a **150–200 word reflection** answering these questions:

- What was the most useful skill you learned in Unit 3?
- Which part was most difficult? Why?
- How can you improve your communication skills in English for engineering?

Unit 5 – Critical Thinking & Problem Solving

Part A – Introduction

Critical thinking and problem solving are central to engineering. Engineers often face **complex problems** that require logical analysis, evaluation of evidence, and effective communication of solutions. In this unit, you will learn how to:

- Analyze engineering case studies.
- Evaluate arguments and identify strong vs. weak reasoning.
- Use persuasive communication in technical contexts.
- Write a persuasive **engineering memo** proposing a solution.

Part B – Reading: Case Study Analysis

Reading Text – The Bridge Design Dilemma

A city government planned to build a new bridge to reduce traffic congestion. Two engineering proposals were submitted:

1. **Proposal A:** A suspension bridge – faster to construct but more expensive.
2. **Proposal B:** A truss bridge – cheaper but requires more maintenance.

The debate focused on cost, safety, durability, and public opinion. Proposal A supporters argued that long-term safety and reduced maintenance would save money. Proposal B supporters claimed that the lower initial cost was more practical for the city's budget.

Finally, the city council chose Proposal A after engineers presented strong evidence of long-term economic benefits and safety.

Comprehension Questions

Task 1 – True or False

1. Proposal A was more expensive but safer.
2. Proposal B required less maintenance.
3. The city chose Proposal B.
4. Engineers influenced the final decision with evidence.

Task 2 – Short Answer

1. What were the two options for the bridge design?
2. Why did supporters prefer Proposal A?
3. Why did others argue for Proposal B?
4. What was the main reason the council chose Proposal A?

Part C – Vocabulary: Argument & Persuasion

1. Key Words

- Claim
- Evidence
- Counterargument
- Persuasion
- Feasible
- Justify
- Evaluate
- Conclusion

2. Practice A – Matching

Match the word to its meaning:

a) Claim

b) Evidence

c) Counterargument

d) Feasible

e) Justify

1. Support or proof for a statement.
2. A statement or opinion presented as true.
3. An opposing point of view.
4. To give reasons for a decision.
5. Possible and practical.

3. Practice B – Fill in the blanks

Use the words *claim, evidence, feasible, justify, counterargument.*

1. The engineer made the _____ that Proposal A was safer.
2. Strong _____ was presented about long-term cost savings.
3. Some argued that the plan was not _____ within the budget.
4. The team had to _____ their design choices in the report.
5. The opposition presented a clear _____ to the proposal.

Part D – Grammar Focus: Argument Language

Engineers use **specific grammar structures** when presenting arguments:

1. **Cause–Effect**

- Because / since / due to / as a result.

  *Example: The bridge collapsed **because** the design ignored wind effects.*

2. **Concessions**

Connector	Part of Speech / Form	Grammar Rule	Typical Position	Formality	Example
although	Subordinating conjunction	Followed by a **clause** (subject + verb)	Beginning or middle of a sentence	Formal/neutral	*Although the project was expensive, it was approved.*
even though	Subordinating conjunction	Stronger emphasis than *although*. Followed by a **clause**	Beginning or middle	Formal/neutral	*Even though the bridge was costly, it was built.*
though	Subordinating conjunction / adverb	Same as *although*, but more **informal**. Can also appear at the **end of a sentence**	Beginning, middle, or end	Neutral/informal	*The machine is old. It works well, though.*
whereas	Subordinating conjunction	Used to contrast two **facts/clauses**	Usually in the middle, between two clauses	Formal	*Proposal A was expensive, whereas Proposal B was cheaper.*
while	Subordinating conjunction	Can mean **contrast** (like *whereas*) or **time**. Needs context	Beginning or middle	Neutral	*While the design is simple, it is effective.*
despite	Preposition	Followed by a **noun, pronoun, or -ing form** (not a full clause)	Beginning or middle	Formal/neutral	*Despite the high cost, the system was installed.*
in spite of	Prepositional phrase	Same as *despite*, but slightly longer. Followed by a **noun, pronoun, or -ing form**	Beginning or middle	Formal/neutral	*In spite of the rain, construction continued.*

3. **Persuasive Modality**

- must, should, need to, have to.

  *Example: Engineers **must** consider safety before cost.*

Practice A – Identify

Underline the cause-effect connectors in:

1. The project was delayed because the materials arrived late.
2. The bridge was successful since engineers considered wind resistance.
3. The experiment failed because the temperature was too high.
4. The machine stopped working as a result of poor maintenance.
5. The system crashed due to a power outage.
6. The tunnel collapsed because the soil was unstable.
7. The building was evacuated since smoke was detected.
8. The test was repeated because the results were unclear.
9. The bridge design was modified as a result of safety concerns.
10. The team succeeded because they worked together.
11. The delay happened owing to heavy rain.
12. The structure failed since the foundation was weak.
13. The road was closed because of flooding.
14. The experiment was canceled due to lack of funding.
15. The machine overheated as a result of continuous use.
16. The test results were unreliable because the sample size was small.
17. The flight was postponed owing to strong winds.

18. The meeting was rescheduled since the manager was absent.
19. The model was adjusted because of calculation errors.
20. The system improved as a result of the new software.

Practice B – Rewrite

Use concessive connectors:

(**although, even though, though, whereas, while, despite, in spite of**).

1. Proposal A was expensive. It was chosen.

   → .....

2. Proposal B was cheaper. It was not selected.

   → .....

3. The machine is old. It still works well.

   → .....

4. The design is simple. It is very effective.

   → .....

5. The software has some bugs. It is widely used.

   → .....

6. The project was risky. Investors supported it.

   → .....

7. The bridge is long. It is safe.

   → .....

8. The cost was high. The project continued.

   → .....

9. The team lacked experience. They finished on time.

   → .....

10. The weather was bad. Construction went ahead.

    → .....

11. The system is complex. It is reliable.

    → .....

12. The road is narrow. It carries heavy traffic.

    → .....

13. The material is light. It is very strong.

    → .....

14. The deadline was short. The team met it.

    → .....

15. The software is expensive. Companies buy it.

    → .....

16. The foundation is weak. The building is still standing.

    → .....

17. The design is unusual. It won an award.

    → .....

18. The machine requires much energy. It saves time.

    → .....

19. The proposal lacked detail. It was accepted.

    → .....

20. The engineer is young. She is very skilled.

    → .....

Part E – Speaking: Debate Practice

Role-Play Debate

Divide into two groups:

- **Group A:** Support Proposal A (suspension bridge).
- **Group B:** Support Proposal B (truss bridge).

Rules:

1. Each side presents **two claims with evidence**.
2. Each side responds with a **counterargument**.
3. Each student must speak for at least 1 minute.

✓ **Model Debate Phrases**

- *Our claim is that…*
- *The evidence shows…*
- *However, the counterargument is…*
- *Although some may argue…, we believe…*

Part F – Writing: Persuasive Memo

Task: Write a **persuasive memo (200–250 words)** recommending one engineering solution.

Structure of a Memo:

- **To/From/Date/Subject**
- **Introduction** – State the problem.

- **Argument 1** – Give claim and evidence.
- **Argument 2** – Address a counterargument.
- **Conclusion** – Recommend solution clearly.

Model Excerpt:

To: City Council

From: Engineering Department

Subject: Recommendation for Bridge Design

After reviewing both proposals, we strongly recommend Proposal A. Although the initial cost is higher, long-term maintenance will be reduced. Studies show a 40% decrease in repair costs over 30 years. In addition, Proposal A ensures greater safety in high winds, protecting public lives.

We therefore urge the council to adopt Proposal A as the most sustainable and responsible choice.

Writing Prompt:

Write a memo recommending either:

- A renewable energy system (solar vs. wind), OR
- A new public transport system (subway vs. elevated train).

Part G – Critical Thinking Challenge

Problem-Solving Scenario:

A university plans to build a new research lab. The options are:

- Build quickly with lower-cost materials.
- Spend more and use sustainable, eco-friendly materials.

Questions for group discussion:

1. What are the short-term and long-term benefits of each option?

   .....

   .....

   .....

2. How would you persuade the university to choose your preferred solution?

   .....

   .....

   .....

3. What evidence would you present to support your case?

   .....

   .....

   .....

Part H – Exercises Review

1. Vocabulary Quiz

Fill in the blanks with: claim, evidence, counterargument, feasible, justify.

1. The scientist presented strong _____ for his theory.
2. Her main _____ was that renewable energy is cost-effective.
3. The opposition gave a strong _____.
4. The project is not _____ without government funding.
5. The engineer had to _____ his choice of materials.

2. Grammar Practice

Correct the sentences:

1. Although Proposal B is cheaper, but it requires maintenance.
2. The bridge collapsed due it strong winds.

Sample Tests

Sample Test 1

Part A – Vocabulary & Grammar (10 pts)

1. Complete the sentence with the correct word:

   a) Engineers must check the _____ (safety / safely) of the machine.

   b) The system failed _____ it overheated. (because / although)

   c) A prototype is _____. (a first model / a final design)

   d) *Reliability* means _____. (being dependable / being expensive)

2. True / False

   a) *Although* introduces a reason. (____)

3. b) ***Due to*** is followed by a noun phrase. **(____)**

4. c) *Moreover* shows addition. (____)

Part B – Reading Comprehension (10 pts)

Read the passage and answer the questions:

Engineers play an important role in solving global problems. For example, renewable energy engineers design systems that reduce dependence on fossil fuels. Civil engineers build strong structures that resist earthquakes. Computer engineers develop software for faster communication. Although each branch is different, they all share a goal: improving human life.

1. What is the main idea of the passage?
2. Name two examples of engineering contributions.
3. Why do civil engineers design earthquake-resistant structures?
4. True/False: All engineers have the same tasks.

Part C – Writing (10 pts)

Write a **formal email** (80–100 words) to your professor requesting information about your project deadline.

Part D – Speaking (5 pts, optional)

Give a **1-minute presentation** about your favorite invention and why it is important.

Sample Test 2

Part A – Vocabulary & Grammar

1. Complete:

   a) The bridge collapsed _____ poor design. (because of / although)

   b) A circuit is _____. (a path for electricity / a construction tool)

   c) *Efficiency* means _____. (working well without waste / being slow)

2. True / False

   a) *In spite of* is followed by a clause. ()

   b) *Whereas* shows contrast. ()

   c) *Because* introduces a cause. (____)

Part B – Reading Comprehension

Passage:

Robotics is transforming industries. Robots are used in car manufacturing, medicine, and even space exploration. They can work faster than humans and reduce the risk of accidents. However, some people worry that robots will replace human jobs.

Questions:

1. Where are robots used? (Give two examples.)
2. What is one advantage of robots?
3. What is one disadvantage mentioned?
4. True/False: Robots always replace humans.

Part C – Writing

Write a **paragraph (100 words)** explaining how teamwork is important in engineering projects.

Part D – Speaking

Explain in simple terms how Wi-Fi works.

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