

Unit 1 The Basics of Engineering

Lead-in

- a) Make a list of main branches of engineering. Compare your list with other students. Then read the text and check how many of the branches listed are mentioned.
- b) Complete the gaps in the text with one of the words from the list:

encompass deals about concerned uses

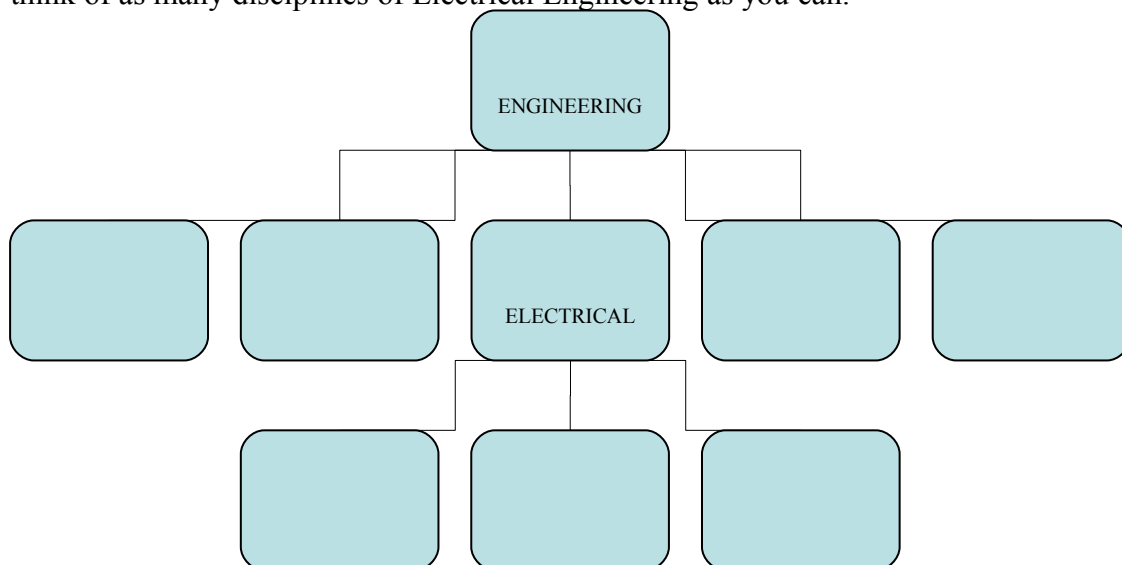
Engineering consists of five main branches.

Civil engineering is 1) **with** the design and construction of roads, railways, water supply systems, bridges and buildings. Chemical engineering 2) **with** the application of chemistry, physics, biology, etc. with mathematics and economics in the process of converting raw materials or chemicals into more useful or valuable forms. Electrical engineering is a very broad area that may 3) the design and study of various electrical and electronic systems, such as electrical circuits, generators, motors, electromagnetic and electromechanical devices, electronic devices, electronic circuits, optical fibres, optoelectronic devices, computer systems, telecommunications and electronics. Electronics engineering is a discipline which 4) the scientific knowledge of the behaviour and effects of electrons to develop components, devices, systems, or equipment (as in electron tubes, transistors, integrated circuits, and printed circuit boards) that uses electricity as part of its driving force. Mechanical engineering is 5) the design and manufacture of physical or mechanical systems, such as power and energy systems, aerospace and aircraft products, weapon systems, transportation products engines, compressors, powertrains, kinematic chains, vacuum technology, and vibration isolation equipment.

Historically, naval engineering and mining engineering were major branches. Modern fields sometimes included as major branches are industrial, aerospace, medical, architectural, and nuclear engineering.

Adapted from <http://en.wikipedia.org/wiki/Engineering>

Task 1 Complete the first part of the diagram using the information from the text and then think of as many disciplines of Electrical Engineering as you can.



Task 2 Decide which areas of electrical engineering are depicted in the pictures.

Energy and power, Marine engineering, Civil engineering, Aeronautics, Telecommunications, Medical engineering



Task 3 Listening

Listen to these short extracts. To which branch of engineering do these engineers belong?

1.
2.
3.
4.
5.
6.
7.

Recording from "Oxford English for Electrical and Mechanical Engineering"

Language study *deals/is concerned with*

What is the link between column **A** and column **B**?

A	B
mechanical	machines
electrical	electricity

Column **A** lists a branch of engineering or a type of engineer. Column **B** lists things they are concerned with. We can show the link between them in a number of ways:

- 1 *Mechanical engineering **deals with** machines.*
- 2 *Mechanical engineers **deal with** machines.*
- 3 *Mechanical engineering **is concerned with** machines.*
- 4 *Mechanical engineers **are concerned with** machines.*
- 5 *Machines **are the concern of** mechanical engineers.*

Adapted from "Oxford English for Electrical and Mechanical Engineering"

Task 4 Make sentences by matching names from column **A** with appropriate items from column **B**.

- | | |
|--------------------------|--|
| 1 electricity generation | a roads, dams, buildings |
| 2 marine | b application of electricity & electronics |
| 3 civil | c power stations |
| 4 electrical | d air conditioning |
| 5 heating | e vessels, oil rigs |

Task 5 Complete the gaps with letters to make a list of properties of materials.

1. b _ _ ttle (e.g. polyester resin) – kruchy
2. chemical- _ _ si _ ta _ t (e.g. epoxy resin) – odporny chemicznie
3. con _ _ ctive (e.g. aluminium) – przewodzący
4. _ _ rro _ _ on-resistant (e.g. brass) – odporny na korozję
5. _ u _ ti _ e (e.g. steel) – plastyczny
6. d _ r _ bl _ – trwały
7. _ _ rd – twardy
8. h _ _ t-resistant – termoodporny
9. m _ ll _ _ bl _ (e.g. copper) – ciągliwy
10. sc _ _ _ ch-resistant – odporny na zarysowania
11. s _ _ t – miękki
12. sti _ _ – sztywny
13. _ _ ugh – mocny, wytrzymały
14. _ _ _ r-resistant (e.g. nylon) – odporny na zużycie/ ścieranie

Task 6

Check whether you know how to pronounce the following symbols.

Mathematical symbols

	Symb ol	Example	Meaning
1.	.	9.7263	
2.	+	$R_1 + R_2$	
3.	-	$V - V_1$	
4.	\pm	$\pm 3m$	
5.	=	$R = R_1 + R_2$	
6.	\neq	$V \neq V_1 + V_2$	
7.	\approx	$I \approx 28mA$	
8.	\times	$f \times 120$	

9.	no sign betwee n two quantiti es	$E = IR$	
10.	one quantit y over another	$\frac{I}{R}$	
11.	\div	$36 \div 5 = 7.2$	
12.	α	$I \propto V$	
13.	:	11:1	
14.	%	25%	
15.	$^\circ$	20 $^\circ$ C	
16.	$\sqrt{\quad}$	$\sqrt{6}$	

17.	²	R^2	
18.	³	X^3	
19.	⁴	10^4	
20.	⁻⁸	10^{-8}	
21.	>	>10dB	
22.	<	<25mA	
23.	\geq	$\geq 8W$	
24.	\leq	$\leq 15W$	

url characters

	Symb ol	Meaning	Example
25.	/		http://www.sciencemag.org/journals
26.	\		
27.	.		
28.	:		www.electrical-source.com
29.	-		
30.			
31.	(wi-fi)	/ 'wai. fa/	

Adapted from "Oxford English for Careers Technology"