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**IONELA IONIȚIU**

**English for Electrical and  
Mechanical Engineering**  
**Student's Book**



**EDITURA UNIVERSITARĂ**  
**București**

I have come to understand that concentrating on more realistic situations and contexts enhances the realism of my teaching materials and methodologies. My lectures cater to intermediate and upper-intermediate students who possess a foundational understanding of English grammar. Consequently, the thematic focus is on enhancing their abilities in reading, writing, speaking, and listening/viewing, which are essential for effective communication within their academic disciplines. In essence, these lectures aim to deepen their comprehension of technical English, facilitate discussions on familiar topics, elucidate key engineering concepts and principles, enable interactions with peers and engineers globally, and ultimately promote greater fluency and precision across various technical domains.

Students receive engaging and thought-provoking lectures on diverse subjects, alongside assignments and exercises in English tailored for Electrical and Mechanical Engineering, fostering substantial discussions throughout. This technical course employs a communicative methodology, integrating the latest innovative techniques with creative new components designed to enhance both teaching and learning experiences.

Each chapter utilizes authentic materials and vocabulary pertinent to numerous mechanical engineering professions, providing students with comprehensive guidance that thoroughly immerses them in the four key language skills: speaking, reading, listening/ viewing, and writing.

**The author**

## Table of contents

<b>Introduction .....</b>	<b>5</b>
<b>Chapter 1. Basic hand tools.....</b>	<b>9</b>
<b>Chapter 2. Electrical tools and equipment .....</b>	<b>21</b>
<b>Chapter 3. Electrical safety signs and symbols .....</b>	<b>33</b>
<b>Chapter 4. Mechanical engineering materials.....</b>	<b>43</b>
<b>Chapter 5. Types of cars.....</b>	<b>56</b>
<b>Chapter 6. Parts of a car: exterior and interior .....</b>	<b>69</b>
<b>Chapter 7. Internal vs external combustion engines.....</b>	<b>81</b>
<b>Chapter 8. Auto systems: electrical and ignition systems .....</b>	<b>92</b>
<b>Chapter 9. Fuel and lubrication systems.....</b>	<b>103</b>
<b>Chapter 10. Exhaust, cooling, and braking systems</b>	<b>113</b>
<b>Chapter 11. Steering, suspension, and transmission.....</b>	<b>124</b>
<b>Chapter 12. Thermal engines versus electric motors.....</b>	<b>135</b>

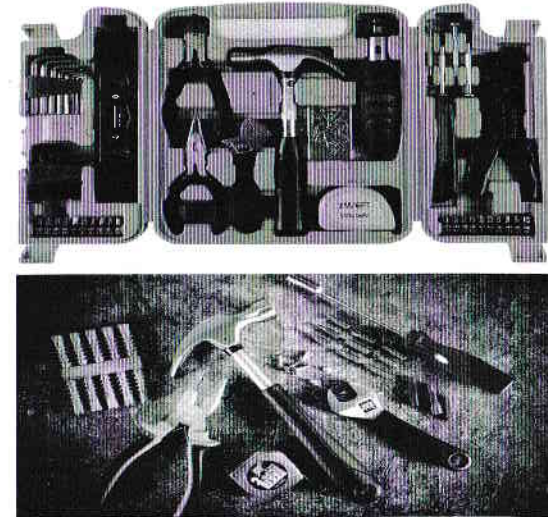
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Chapter 13. Engine problems.....	146
Chapter 14. Basic Electricity.....	160
Chapter 15. Renewable sources of energy .....	172
Chapter 16. Using electric energy.....	182
References .....	193

## Chapter 1

### Basic hand tools

**Task 1. Pair work activity (5 minutes).** Look at the pictures below and try to identify/list as many hand tools as possible. Compare your lists and then check your answers using the following online glossaries: <https://www.macmillandictionary.com/thesaurus-category/british/general-hand-tools> or <https://www.eslbuzz.com/tools-and-equipment-vocabulary-150-items-illustrated/> :



(Source: <https://www.google.com/search?source=univ&tbm=isch&q=hand+tools+pictures&sa=X&ved=2ahUKFwiw097yiZXRhAhXRFxcKHfn9BUAQsAR6BAgKEAE&biw=1366&bih=657#imgrc=wEb7qVZB8PmcVM&imgdii=SZ632eIQNIwp2M>)

**Task 2.** Before reading the passage, discuss these questions:

- a. What tool can be used to cut wires?
- b. What tools would mechanical engineers use to fix a car or a flat tire?
- c. How many types of screwdrivers and wrenches do you know?

**Task 3. Reading activities**

**3.1. Skim through the text to fulfill the following tasks:**

After having spent the past 14 years working on several houses in some form or fashion, I have filled my tool belt with a collection of tools and gadgets that I consider to be, not only essential, but almost universal to any project.

Admittedly, some tools are specific to a particular job, such as a taping tool for applying a joint compound or a paintbrush. However, I have found that I consistently use a small battery of tools in just about every job that I work on. Whether I am hanging drywall, framing a wall, installing ceramic tile, or changing electrical fixtures, I always seem to need the same basic set of tools. I am able to grab my well-worn tool belt and not have to think about what tools that I might need, other than power tools or any specialty tool.

I suspect that my most used tool is my tape measure. The old adage of “measure twice, cut once” is very sound advice. I keep a 25-foot tape measure on my tool belt at all times, and I always make sure that I have at least one pencil

for marking the measurements. In order to sharpen the pencil and also to cut a plethora of other items, I have a utility knife with a retractable blade. I make sure to keep a supply of new razor blades in the handle of the utility knife.

The most important thing to keep in a tool belt is a pair of safety goggles. These have the obvious use of keeping dangerous particles out of your eyes while cutting or performing demo work, but they can also be worn while painting to keep specs of paint from splattering into your eyes. If you have ever painted anything above your head, you’ll have a greater appreciation for wearing goggles to keep paint from falling into your eyes.

Old-fashioned hand-operated screwdrivers are essential. Don’t get me wrong, I love my cordless drill. I am rarely without it. However, some things require an actual screwdriver, and the precision that it provides. For example, a hand-operated screwdriver is the better choice for attaching electrical wiring to a new plug or switch. You might install a new junction box using a screw gun or even screw the switch into the box with it, but there are some things that just cannot be done with a screw gun because the work is too tedious. I keep a medium-sized flat blade and a Phillips head screwdriver on hand at all times. I also have a Phillips head extension bit in my tool belt for use with my cordless drill.

As the old saying goes, “necessity is the mother of invention,” and I have found a dozen uses for roof flashing and sheet metal. I have discovered that I frequently have a need for a pair of Lineman’s pliers and a pair of aviation cutters, which are nothing but a glorified pair of tin-snips albeit with a finer cutting surface. I don’t use them too

often, but when I do need them, they are worth their weight in gold. One of the many uses for Lineman's pliers is to cut off old nails that are difficult to pull out or to fix misdirected nails from a nail gun.

I love nail guns, especially the cordless models manufactured by Paslode, but as with a cordless drill versus a screwdriver, some things require a hammer. Therefore, I carry two different kinds. My favorite, by far, is a framing hammer. This is one of my most used tools. It's not only great for driving nails, but with an extra-long, leverage-providing neck and claws that are almost perpendicular to the handle, it is the best demolition tool that I have found. I like to use it as a pry bar and then use a finish hammer to knock the claws of the framing hammer between whatever I am trying to separate. It works wonders for removing trimwork of all sorts.

The final tool that I have is a voltage tester. For most applications, I like the pen model that simply beeps and glows red when it is in contact with electricity. I find it easier to use than the model that has red and black wires.

I can use the pen model with one hand. The other version requires one hand for the red wire and one hand for the black wire, and then a third hand to hold the box that shows the voltage scale.

In addition to this collection of tools, I have a small supply of drywall screws and assorted nails. Most of these are the result of throwing extra ones into one of the pouches on the tool belt when I don't want to put them back in their proper container. I found that I often need one or two of these, and it's much easier to dig in the bottom of a pocket than to climb down a ladder to get just one nail.

After reading all this one may think that I have a tool belt the size of a steamer trunk. However, I have used the same inexpensive tool belt that is designed in a carpenter's apron style for the past fourteen years. Some people prefer the new, nylon tool bags that are similar to a toolbox but that are open on the top for easy access. I've been told, and it seems to make sense, that a hard-sided tool bag of this type is the best choice because it won't be constantly closing while you're using it. The soft-sided models collapse on themselves, hindering the retrieval of the tools.

Regardless of how you carry your gear, having the right tools often makes the difference between doing a mediocre job and doing a professional job.

(Adapted from

<https://extremehowto.com/hand-tools-for-every-job/>)

### **3.1.1. Mark the following statements as True (T) or False (F):**

- a. The tool belt is provided with a customary utility knife with no retractable blades.
- b. When the work required is tedious, he uses a cordless drill.
- c. He wears goggles whenever he paints above his head.
- d. His belt is equipped with two different types of hammers.
- e. The Lineman's pliers are used to cut off old and misdirected nails.
- f. He prefers to put back all the drywall screws and assorted nails in their proper containers.

### 3.1.2. Answer the following questions;

- a. Why is his tool belt equipped with a tape measure and a utility knife?
- b. Why does he prefer a screwdriver instead of a cordless drill?
- c. What kind of voltage tester is he using?
- d. What is the difference between a framing hammer and a finish hammer?
- e. Why are tool belts so important?
- f. What would your tool belt look like? What other tools would you like to add?

### 3.2. Read the text below and complete the following tasks:

A mechanic is only as good as the tools he's working with. After all, making tools for solving complex problems was the tactic that gave humans an evolutionary advantage. Mechanics especially need a comprehensive inventory of tools at their disposal because of the wide range of automotive issues that can *arise*. (1).....

#### Ratchet sets

These might end up being your most-used tools in an entire set. While the actual "ratchet" part of a ratchet set was originally the key feature, now they're fairly common, and needing these tools for nuts and bolts on your vehicle is practically a guarantee for every project. A good ratchet set can include not just regular sockets, but also Philips head,

hex keys, and Allen keys that will give you the ability to take apart anything you need.

#### Screwdrivers

A humble yet crucial tool in your mechanic's arsenal is the screwdriver. (2)..... Different tool sets can come with various types of screwdrivers and features like *ergonomic* handles, magnetic types, universal screwdrivers, and specialty screwdrivers.

#### Pliers and wire cutters

There is an endless supply of electrical problems you can have in your car or even just extra features that need to be wired in. A good set of wire cutters can make your job much easier and save precious time off of electrical work inside your vehicle. Pliers are not only good for wiring but can also be incredibly useful when you least expect it.

#### OBD2 sensors

An OBD2 sensor can make all the difference when you're trying to diagnose your vehicle. These *devices* are a mechanic's secret weapon, and it can be yours as well. An OBD2 sensor can read the check engine light in your car and tell you what is throwing the code. (3).....

#### Specialty tools

There are plenty of unusual tools that are required for automotive work. Your headlights can be adjusted with a headlight adjustment tool or a headlamp spring tool. Did you know car batteries have their own special tool? A battery carrier has large jaws that are made to *slide* into the tightest spaces and have a handle on top so you can easily

carry out a car battery. Spark plug pliers are specialty pliers that are padded at the end so you don't damage your spark plugs when trying to remove them. There is also a vehicle-specific fork tool that is made to slide under the clips that hold your vehicle's interior together.

### Other Considerations

**Pneumatic and Automatic Tools:** Air-powered and electric tools can make your job a lot easier. Many of the types of tools mentioned above have powered versions that might be better equipped for certain tasks. The most important part is if you're going to use both hand tools and automatic tools, (4).....

**Variety:** Working on cars requires many different types of tools. Finding a toolset that covers all your bases is going to make your life easier when working on your vehicle.

**Case:** One of the best features that a tool set can come with is a case or toolbox. A high-quality toolbox can keep your tools safe, make it easy to store them, and save you the *hassle* of finding a place to put them.

(Adapted from

<https://www.thedrive.com/reviews/29188/best-hand-tools>)

**3.2.1. Four sentences/ groups of words have been removed from the text. Select the appropriate sentence/ group of words for each gap in the text. There is one extra sentence/ group of words which you do not need to use.**

- a. Not only do we need them for the plethora of screws you'll find in a car, but screwdrivers can also be a versatile asset when you're working on a big project.

- b. then buying sockets and other attachments that are safe for both can save you money in the long run.
- c. Consider investing in the appropriate protective gear as well as tools because working safe can keep you from fatigue, injury, and other harm that is typical of automotive work.
- d. This saves plenty of time trying to figure out your problem.
- c. To help make your job easier, we've narrowed down the best hand tool sets for mechanics.

**3.2.2. Explain the underlined words. Do not translate them.**

**3.2.3. Sum up the text in about 50 words.**

### 4. Vocabulary

**4.1. Match the words or phrases in column A with their definition in column B:**

1. tape measure	a. a larger and heavier, straighter claw tool suitable for framing works.
2. utility knife	b. an electrical device used for checking circuits.
3. cordless drill	c. a spring-loaded mechanism that exposes the blade only while a slider or button is held
4. framing hammer	d. tool used to drive nails into wood or some other kind of material.

5. voltage tester	e. an electrical appliance working without connection to a main supply or central unit.
6. retractable blade	f. a length of the tape or thin flexible metal, marked at intervals for measuring.
7. nail gun	g. a knife with a small sharp blade, often retractable, designed to cut wood, cardboard, and other materials.

**4.2. Write a word that has a similar meaning to the underlined part:**

a. This tool is used whenever you need to cut tape, cord, cardboard, or other packaging material. = u \_\_\_\_\_ y k \_\_\_\_\_ e

b. A tool used to drive nails into a wooden surface, to shape metal, or to crush/ smash something. = h \_\_\_\_\_ r

c. A tool used to tighten or loosen screws that has a cross-shaped tip. = P \_\_\_\_\_ ps s \_\_\_\_\_ e \_\_\_\_\_ er.

d. This tool combination allows you to turn a nut or a bolt without repositioning the tool on the fastener — as it happens with a wrench when there isn't enough room to turn it in a full circle. = s \_\_\_\_\_ t w \_\_\_\_\_ h

e. A tool with a fine-toothed saw, originally and mainly made for cutting metal. = ha \_\_\_\_\_ a w

**4.3. Pair work activity – role play. Imagine you are a tool supervisor. Talk to your partner about what tools are needed to fix a car. (10 lines)**

**5. Group work activity – brainstorming. Translate into English:**

Trusa cu scule te ajută să repara diverse lucruri sau să faci intervenții minore: poți bate cuie cu ciocanul pentru a monta un tablou, poți fixa șuruburi cu ajutorul șurubelnițelor, să tăiați sârma cu patentul, să montați o piesă de mobilier sau să măsurați o suprafață.

Trusă scule 25 buc 239352

Greutate set 3.5 Kg

**Conținut**

4x șurubelniță (-) 5, 6, (+) 5, 6

1x ciocan cu coadă fibră 300 g

1x bandă izolatoare

1x cheie franceză 200 mm

1x clește combinat 180 mm

1x cutter

x1 metru cu bandă oțel retractabil 3 m

9x chei hexagonale (imbus) 1,5-2-3-4-5-5,5-6-8-10 mm

4x pile 200 mm (lată, semirotondă, dreptunghiulară, rotundă)

1x clește cu nas lung 150 mm

(Adapted from

<https://www.dedeman.ro/ro/truse-cu-scule/c/290>)

**6. Listening/ viewing. Watch the video and try to perform the tasks:**

<https://www.youtube.com/watch?v=4o0tqF0jDdo>

**6.1. After viewing the material, mark the following statements as true (T) or false (F):**

a. You can use a hammer and a punch to strike with and make a dimple.