WORK BOOK
COURSE 3

This work book was worked out on newly established requirements, embracing all aspects of study skills: reading, listening and speaking.

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PREFACE

The decree of the President of the Republic of Uzbekistan PD – 1875 as of 10 December 2012, “On Measures of further Improvement of teaching of foreign languages”, was the essence of the country’s reforms in the field of teaching foreign languages. Since the adoption of the system – generating decree all the work in this area has been intensified and major reforms in modernization of teaching foreign languages at all levels of continuous education have been started. According to the targets set by the government of the Republic, New state Educational Standards, based on international experience – CEFR were adopted.

This work book was worked out on newly established requirements, embracing all the aspects of study skills: reading, listening and speaking.

Work book for the third year students consists of 11 lessons and one unit review in each. It is assumed for approximately 54 hours. Each unit begins with motivation activity focused on a new topic, followed by

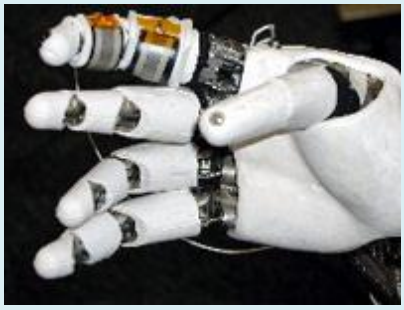
Grammar exercises, listening and speaking, reading and writing activities.

“English” for the third year students is B2 level students book designed to meet the communication needs of students, English for Specific Purposes and also for self education of the students.

After all, this student’s book was created by the group of the authors (teachers) in order to develop their level of knowledge in English. And we hope that students will find it useful for increasing their English language skills.

Lesson 1. Explaining how technology works.

How Robots Work

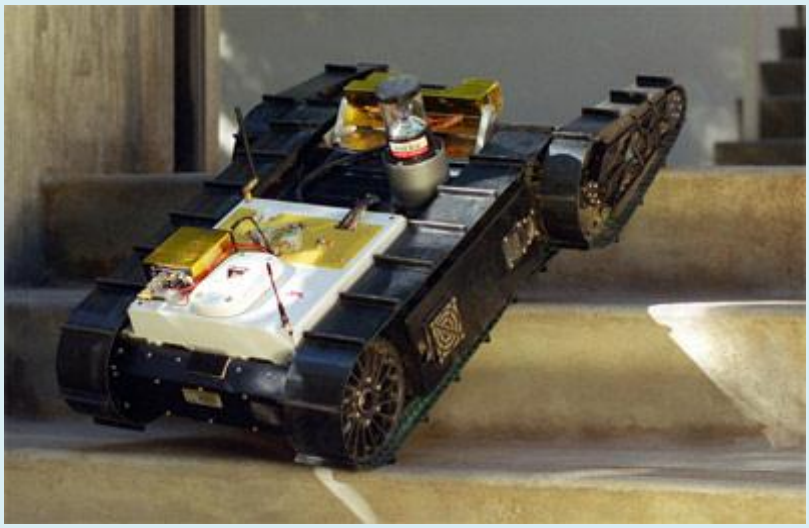


The vast majority of robots do have several qualities in common. First of all, almost all robots have a movable body. Some only have motorized wheels, and others have dozens of movable segments, typically made of metal or plastic. Like the bones in your body, the individual segments are connected together with **joints**.

Robots spin wheels and pivot jointed segments with some sort of **actuator**. Some robots use electric motors and solenoids as actuators; some use a hydraulic system; and some use a pneumatic system (a system driven by compressed gases). Robots may use all these actuator types.

A robot needs a power source to drive these actuators. Most robots either have a battery or they plug into the wall. Hydraulic robots also need a pump to pressurize the hydraulic fluid, and pneumatic robots need an air compressor or compressed air tanks.

The actuators are all wired to an **electrical circuit**. The circuit powers electrical motors and solenoids directly, and it activates the hydraulic system by manipulating electrical **valves**. The valves determine the pressurized fluid's path through the machine. To move a hydraulic leg, for example, the robot's controller would open the valve leading from the fluid pump to a **piston cylinder** attached to that leg. The pressurized fluid would extend the piston, swiveling the leg forward. Typically, in order to move their segments in two directions, robots use pistons that can push both ways.



The robot's computer controls everything attached to the circuit. To move the robot, the computer switches on all the necessary motors and valves. Most robots are **reprogrammable** -- to change the robot's behavior, you simply write a new program to its computer.

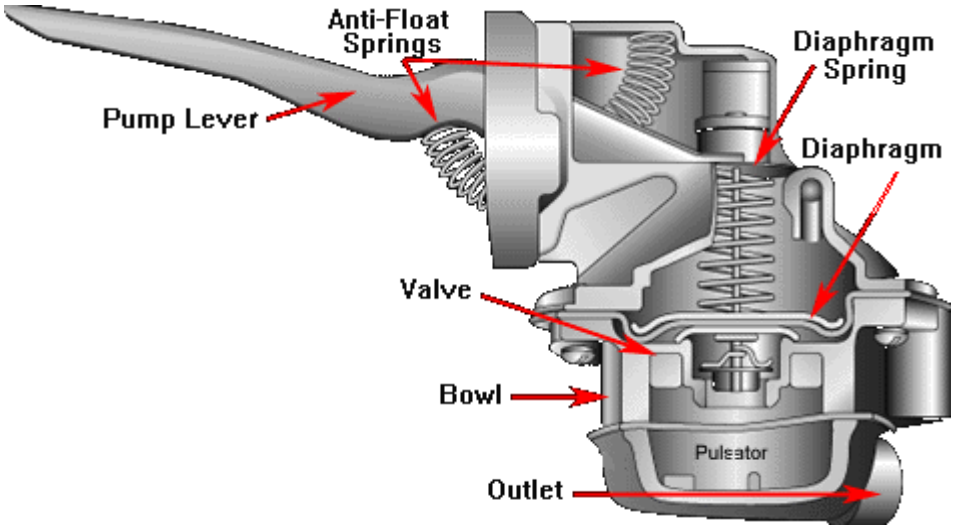
Not all robots have sensory systems, and few have the ability to see, hear, smell or taste. The most common robotic sense is the sense of movement -- the robot's ability to monitor its own motion. A standard design uses slotted wheels attached to the robot's

joints. An LED on one side of the wheel shines a beam of light through the slots to a light sensor on the other side of the wheel. When the robot moves a particular joint, the slotted wheel turns. The slots break the light beam as the wheel spins. The light sensor reads the pattern of the flashing light and transmits the data to the computer. The computer can tell exactly how far the joint has swiveled based on this pattern. This is the same basic system used in computer mice.

These are the basic nuts and bolts of robotics. Roboticists can combine these elements in an infinite number of ways to create robots of unlimited complexity. In the next section, we'll look at one of the most popular designs, the robotic arm.

Lesson 2. Emphasising technical advantages.

Benefits of a High Pressure Fuel Pump



There are several reasons why a **high pressure fuel pump** is preferred. Knowing what kind of the benefits will help you to get a better understanding of the type of fuel pump that will work best for you. You will need to do your homework and look around to make sure that you are getting the best around. The better of an understanding you have, the better off you and your vehicle will be.

1 - Fuel Efficiency

One of the best things about a high pressure fuel pump is the efficiency. You will find that you will be able to move a much higher volume of fuel much faster than before. This will help you to get the fuel that you need when and where you need it. Fuel efficiency is something that is going to help to benefit you in several ways. You will definitely feel the biggest benefit at the gas pump. You will find that you will need to fill up a lot less often. Being able to get a high pressure fuel pump will help to prevent you from having to fill up your tank so much.

2 - Safer

A high pressure fuel pump is much safer for your car as well as cheaper in the long run. Fuel pumps that have a higher pressure have it because more often than not, they are placed in the actual fuel tank. This will help to prevent any fires starting. Having the fuel pump installed in the fuel tank is the absolute safest place that you could put it on your car.

There is a lot of technology that goes with a high pressure fuel pump. This will help to keep you safer while in your car at all times. You will find that there is a

censor on a lot of these fuel pumps that will shut itself off if need be. This basically means that if you happen to be in a head on collision, the fuel pump will shut off. This means that there will be less chance of any gas leakage and that of course, is a great thing.

3 - Most Popular

Because there are so many benefits, you will find that there are a lot more high pressure fuel pumps than not. This means that they are becoming more and more easy to find. Of course, that does not mean that they are everywhere, there will be a lot that claim to be, but that doesn't necessary mean that they are. You will need to ask around and do your homework on them to make sure that you are getting a real high pressure fuel pump.

Just because they have all of these benefits, does not necessarily mean that they are very expensive. You will find that as time goes by, they are becoming more and more affordable. Because of their growing popularity, they are really going to be a necessity. Regardless of what you spend on one, you will be able to see every single penny back quickly and much more with what you will be saving at the gas pump each and every week.

Lesson 3. Describing specific materials.

TEXT

Automobile Production

I study at the college, at the automobile-construction department. When I graduate from the college I shall become a technician. All specialists in automobile industry dealing with manufacturing automobiles (cars or trucks) must know that the production of the automobile comprises the following phases:

-designing;
-working out the technology of manufacturing processes;
-laboratory tests;
-road tests;
-mass manufacturing (production).

Why is it necessary to know all these facts? It is important to know them, as before the automobile is put into mass production it should be properly designed and the car must meet up-to-date requirements. What are these requirements?

The automobile must have high efficiency, long service life, driving safety, ease of handling and maintenance, pleasant apperance. Also it must be comfortable and ecological. In order to obtain these qualities the specialists should develop up-to-date methods of designing cars using new types of resistant to corrosion light materials. Also it is important to know computer sciences because computers offer quick and optimal solutions of the problems. Besides they are used for better operation of mechanisms in cars.

Before the car is put into mass production the units of the car are subjected to tests in the Works laboratory and then the car undergoes a rigid quality control in road tests. Why are these tests required? What qualities are required of the automobile? They are needed because the modern automobile must be rapid in acceleration, have smooth acting clutch, silent gearbox, dependable braking and steering systems, dependable ignition system, low fuel consumption and be stable on the road.

The exercises to be done after reading the text

Exercise 1.

Find out the words according to:

а) the automobile production;

б) the functions of automobile. Write down their uzbek equivalents.

Exercise 2.

Find out the answers from the text above:

1.What department do you study at?

2.What will you become after graduating from the institute?

3.What should automobile specialists know?

4.What phases does the production of the automobile comprise?

5.What requirements must modern automobiles meet?

6.Why are automobile units and mechanisms subjected to laboratory and road tests?

7.What qualities are required of the automobile?

8.Why are the computers used in cars?

Exercise 3.

Fill up the gap using prepositions and translate into uzbek.

1.After graduating ... the institute I shall deal ... manufacturing cars.

2.The production ... the automobile comrises five phases.

3.Specialists ... automobile industry should develop up-to-date methods... designing cars.

4.In producing of automobiles new types ... resistant... corrosion light materials should be used.

5.All cars undergo a rigid quality control... tests.

6.The car is put... mass production after laboratory and road tests.

7.Technicians must know the technology... manufacturing proc - esses... cars.

Exercise 4.

Complete the sentences using the appropriate word combinations given below:

1. An automobile specialist deals with ....

a.working out technological processes;

b.constructing and manufacturing cars;

c.producing of a new resistant to corrosion light materials.

2. The production of the automobile comprises ....

a.designing and mass production;

b.manufacturing and tests;

c.designing and working out technological processes, laboratory and road tests and mass production.

3.The cars are subjected to tests in order....

a.to work out new technological processes;

b.to meet up-to-date requirements;

c.to shorten the time between designing and manufacturing.

4.The qualities required of the automobile are ....

a.high efficiency, long service life, driving safety and pleasant appearance;

b.smooth acting clutch, silent gearbox, dependable braking and steering systems;

c.new types of resistant to corrosion materials.

5. The car must have the following units:....

a.high efficiency, long service life, driving safety and pleasant appearance;

b.smooth-acting clutch, silent gearbox, dependable braking and steering systems;

c.new types of resistant to corrosion materials.

Lesson 4. Categorising materials.

Vocaulary:

Thermal - relating to or associated with heat
kinetic energy - the energy an object has due to its motion

subsequent - coming after or later
acceleration - an increase in speed
composite - a substance made up of a number of ingredients
dissipate - to disappear into the air
absorption - soaking up
ferrous - relating to or containing iron
susceptible to - easily affected by
polymer - plastic
non-metalic - containing no metal
ceramics - materials made by heating a nonmetallic mineral, at a high temperature
comprise - made of
hazardous - dangerous
waterproof - not permitting the passage of water
conductor - a substance which allows the passage of electricity
coated - covered with a layer
moisture - dampness; wetness
deceleration - slowing down; the opposite of acceleration
insulation - a protective coating used to prevent the transfer of heat or electricity

waterproof	A. an increase in speed
deceleration	B. not permitting the passage of water
insulation	C. slowing down; the opposite of acceleration
acceleration	D. a protective coating used to prevent the transfer of heat or electricity
composite	**E.** a substance made up of a number of ingredients

5 Multiple choice questions

1. easily affected by

- subsequent
- absorption

- susceptible to
- insulation

2. plastic

- polymer
- thermal
- moisture
- coated

3. covered with a layer

- polymer
- composite
- coated
- comprise

4. dampness; wetness

- coated
- comprise
- moisture
- polymer

5. materials made by heating a nonmetallic mineral, at a high temperature

- ferrous
- comprise
- coated
- ceramics

True/False statements

1. relating to or associated with heat → thermal

True False

2. soaking up → absorption

True False

3. dangerous → hazardous

True False

4. coming after or later → subsequent

True False

5. to disappear into the air → dissipate

True False

Lesson 5. Components and assemblies.

Working with vocabulary:

Bolt - a long narrow piece of mental that you slide across the inside of the door or window in order to lock it

Clip - a small mental or plastic object used for holding things together or in place

Sawing - a basic machining process in which chips are produced by a succession of small cutting edges, or teeth, arranged in a narrow line on a saw "blade"

Milling - basic machining process by which a surface is generated by progressive chip removal; uninterrupted cutting process wherein entering and leaving the cut subjects the tool to impact loading, cyclic heating, and cycle cutting forces

flame-cutting - using oxy fuel (oxygen + combustible and punching gas)

shearing - use of pressure on smooth-edged blades for guillotining

guillotining - make a straight cút by applying pressure to shear the material

kerf - is the width of the saw cut

Abrasive - has a hard, rough surface for cutting or grinding

Exersice 1. Multiple choice questions

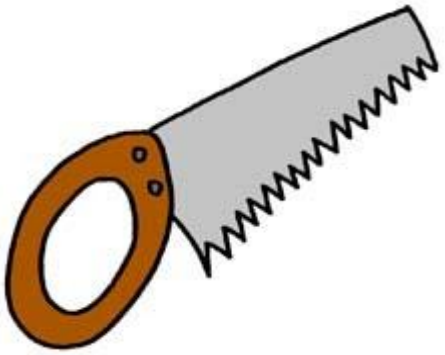
1. has a hard, rough surface for cutting or grinding

- bolt
- shearing
- sawing
- abrasive

2. make a straight cút by applying pressure to shear the material

- milling
- sawing
- shearing
- guillotining

3. a basic machining process in which chips are produced by a succession of small cutting edges, or teeth, arranged in a narrow line on a saw



"blade"

- shearing
- milling
- clip
- sawing

Exersice 2. True/False statements

1. is the width of the saw cut → clip

- True
- False

2. a small mental or plastic object used for holding things together or in place  → bolt

- True
- False

3. use of pressure on smooth-edged blades for guillotining → sawing

- True
- False

Lesson 6. Explaining and assessing manufacturing techniques.

Working with vocabulary:

Drilling - making a hole with a pointed power or hand tool using a drill bit
Milling - removing surface layers through multiple cutting wheel passes
flame-cutting - using oxygen and combustible gas to cut metal using flame
grinding - removing material using machine with an abrasive surface
guillotine - a press with a smooth blade used to cut sheet metal
toothed blade - a blade with a serrated edge
Kerf - the material removed during the sawing process
heat-affected zone - the area of an object that has been affected by heat during cutting with flame.
secondary operation - An additional process that needs to be performed before a job is finished
intricate - complex
distortion - twisted or pushed out of natural shape or position.
Abrasives - rough materials that scour or rub away a surface
Alter - change
Exert - to apply force or pressure
shear forces - forces that bend or tear the material by pressing different parts in opposite directions at the same time
acetylene - a combustible gas used in flame cutting
rough - not smooth
tough - difficult to work or cut
brittle - hard, but easily broken or snapped
intuitive - can be easily figured out without special training

Exercise 1. Matching questions

intuitive	**A.** the area of an object that has been affected by heat during cutting with flame.
Kerf	**B.** the material removed during the sawing process
heat-affected zone	**C.** removing surface layers through multiple cutting wheel passes
milling	**D.** removing material using machine with an abrasive surface
grinding	**E.** can be easily figured out without special training

Exercise 2. Multiple choice questions

1. a blade with a serrated edge

- toothed blade
- tough
- acetylene
- brittle

2. twisted or pushed out of natural shape or position.

- brittle
- intuitive
- guillotine
- distortion

3. complex

- brittle
- exert
- intricate
- intuitive

4. a combustible gas used in flame cutting

- acetylene
- alter
- brittle
- milling

5. not smooth

- tough
- alter
- rough
- Kerf

Exercise 3. True/False questions

1. forces that bend or tear the material by pressing different parts in opposite directions at the same time → abrasives

- True
- False

2. change → alter

- True
- False

3. to apply force or pressure → Kerf

- True
- False

4. rough materials that scour or rub away a surface → abrasives

- True
- False

5. hard, but easily broken or snapped → brittle

- True
- False

Check answers

Lesson 7. Explaining jointing and fixing techniques.

Working with vocabulary:

Bolt - A threaded pin or rod with a head at one end, designed to be inserted through holesand secured by a nut

Screw - A threaded pin or rod with a head at one end, which is narrower at the point and is designed to be inserted into a material by turning using a driving device

Rivet - A metal bolt or pin having a head on one end, inserted through aligned holes in the pieces to be joined and then hammered on the plain end so as to form a second head.

Clip - a mechanical device used to temporarily join two objects together

Weld - To join metals by applying heat, sometimes with pressure and sometimes with an intermediate or filler metal having a high melting point.

Adhesive - glue

Bond - to join objects together using adhesive or glue

Glue - A substance that join things together

Join - to put together

Connect - to join

Inevitable - it will happen

Work loose - to become loose over time due to vibration

Fixing - Joining objects together using a variety of means

Mechanical - involving mechanical joints

Non-mechanical - involving no mechanical joints

Disconnected - is not connected

Tightly - close together

Vibration - the act of vibrating

Flawed weld - damaged; defective; imperfect

Cost-effective - Economical; good value in relation to the price, or cost

Rival - the contestant you hope to defeat

flip side - on the other hand

Offset - Counteract, compensate for (verb); a counterbalance (noun)

Component - one part of a mechanical object

external factors - Environmental characteristics that can influence or have an effect on something

inadequate - not enough

Exercise 1. Matching questions

Bolt	**A.** a mechanical device used to temporarily join two objects together
Mechanical	**B.** close together
Clip	**C.** to join objects together using adhesive or glue

Bond	**D.** involving mechanical joints
Tightly	**E.** A threaded pin or rod with a head at one end, designed to be inserted through holesand secured by a nut

Exercise 2. Multiple choice questions

1. involving no mechanical joints

- Connect
- inadequate
- Mechanical
- Non-mechanical

2. is not connected

- Disconnected
- Connect
- component
- Screw

3. Environmental characteristics that can influence or have an effect on something

- inadequate
- Connect
- Vibration
- external factors

4. damaged; defective; imperfect

- flip side

- Glue
- Flawed weld
- Weld

5. it will happen

- Weld
- inadequate
- Rival
- inevitable

Exercise 3. True/False questions

1. the contestant you hope to defeat → Rival

True False

2. not enough → inevitable

True False

3. Economical; good value in relation to the price, or cost → Cost-effective

True False

4. A substance that join things together → Clip

True False

5. Joining objects together using a variety of means → Join

True False

Check an

Lesson 8. Engineering design.

Working with drawings

Working drawings provide dimensioned, graphical information that can be used; by a contractorto construct the works, or by suppliers to fabricate components of the works or to assemble or install components. They may include architectural drawings, structural drawings, civil drawings, mechanical drawings, electrical drawings, and so on.

Traditionally, working drawings consist of 2 dimensional orthogonal projections of the building or component they are describing, such as plans, sections and elevations. These may be drawn to scale by hand, or prepared using Computer Aided Design (CAD) software. However, increasingly, building information modelling (BIM) is being used to create 3 dimensional representations of buildings and their components for construction. This may be described as a virtual construction model (VCM) and can comprise a number of different models prepared by different members of the project team.

Working drawings may include title blocks, dimensions, notation and symbols. It is important that these are consistent with industry standards so that their precise meaning is clear and can be understood. Specification information can be included on working drawings or in a separate specification, but information should not be duplicated as this can become contradictory and may cause confusion.

TYPES OF DRAWINGS

A complete set of house plans usually contains floor plans, elevations, sections and "details" that together form a detailed picture of the entire house. There is often a separate page for each major trade, including a site plan, floor plans, foundation plan, electrical plan, plumbing plan, and framing plan. In general, each drawing is either an elevation , plan , or section view, as described below:

Floor plans: These are views looking straight down at the floor, showing precisely dimensioned rooms, closets, kitchens and baths, and the locations of doors, windows, stairs, and other interior elements (at left).

Wall sections cut through the building, showing foundation, framing, and insulation details. Click to enlarge.

Sections: These drawings show what you would see if you cut a slice through the building, revealing the inside of walls, floors, foundations, and other elements. Most common are elevation sections, cut vertically through the walls and floors. Sections are especially useful for carpenters trying to see how the framing and other elements fit together (at left).

Section detail of deck attachment to house. Click to enlarge.

Details: These are drawings of specific elements where the designer wants to provide more detailed information than can be seen in the larger drawings of the entire house. A larger scale may be used.

Lesson 9. Discussing dimensions and precision.

Listening. A floor design.

Speaking on the listening material.

Lesson 10. Describing design phrases and procedures.

Reading on the topic.

Writing on the reading material.

Lesson 11. Describing types of technical problem.

5 Ways Designers Solve Problems

Designers, by nature, are problem-solvers. Every project is a problem or challenge that involves helping other people understand something. Designers have to see through all the fog and clutter to create a solution.

This creative type of problem solving comes naturally in part, but some of the actions are learned. Have you ever stopped to think about how you work to solve problems? Here we will examine 10 ways that designers do just that with a collection of abstract images to inspire some of that problem-solving thinking.

1. Think About Users

Designers have to consider the audience for everything they do from the start of any project. This process involves considerations that impact the design – from color to type to imagery – and is something that can help you better communicate with users.

When thinking about audience and users there are a handful of questions that designers should ask? By thinking about how design will be received, it can be better planned.

How will this item work?
Do color choices create the right mood?
Is type both readable and easy to read?
What does the user feel when interacting with this design?
Does the design match the company/brand's image and persona?

2. Visualize How It Works

Picture yourself interacting with the final product. Whether it is a website, business card or label on a wine bottle, people will look at and often touch the design in some way. How does it work? What is the usefulness of the design?

Designers will often create a mockup version during the design process that mimics how these interactions will work to gauge the effectiveness of the overall design concept. This type of problem solving considers actual use and function first and aesthetics second.

3. Develop Multiple Solutions

The part of the process where designers can really have fun (or find immense frustration) is in the development of multiple solutions to a single problem. Think of the number of projects where you have designed something you thought the client would like, something you like and something that falls somewhere in the middle.

Every design project presents an opportunity to try a multitude of things. The end result may look like one of these early concepts, a hybrid of concepts or none of the above. This evolution and flexibility to evolve is a key trait of most design professionals.

4. Invite Participation

Collaboration is the key to success. Without input along the way, many designers would agree that many projects would not turn out in the same way.

But you need to invite that participation. Ask for help along the way. Gather feedback about ideas, color and type choices, imagery and function. (As a designer, I have always been used to constant feedback and collaboration in projects, so much that I am always a little surprised when others are not so accustomed to this type of workflow.)

5. Immerse Yourself In the Project

Think of all the times you have “locked yourself away” to work on a project and get it finished. It can be all-consuming, forcing you to think about it even when you are not working.

Even those of us who don’t go all in on a single project often find that it’s always on the brain. That thought process is happening all the time and often results in that “a-ha moment” when it all comes together and you feel the need to get to work immediately.

Good or bad, designers often have a difficult time separating from working projects. Any encounter or song lyric or conversation can result in the spark that helps to finish a job.