OPEN VOCATIONAL EDUCATION PROGRAMME

452/453

Diploma Course in

BASIC RURAL TECHNOLOGY

452 - Our Health

453 - Agriculture & Animal Husbandry

विद्यायनम् सर्वधनं प्रधानम्

NATIONAL INSTITUTE OF OPEN SCHOOLING

Open Vocational Education Programme

Course Code-452

Basic Rural Technology

1

OUR HEALTH

Course Coordinator

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Basic Rural Technology

OUR HEALTH

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FROM THE DESK OF CHAIRMAN .....

Dear Learner,

Welcome to the National Institute of Open Schooling!

By enroling with this institution, you have become a part of the family of the world's largest Open Schooling System. As a learner of the National Institute of Open Schooling's (NIOS) Vocational Programme, I am confident that you will enjoy studying and will benefit from this very unique School and method of training.

Before you begin reading your lessons and start your training, there are few words of advice that I would like to share with you. We, at the NIOS, are well aware that you are different from other learners. We realize that there are many of you who may have rich life experiences; you may have prior knowledge about trades and crafts that are part of your family's legacy; you may have a sharp business sense that will make you fine entrepreneur one day. Most importantly, you have the drive and motivation that has made you enrol with this institution, which believes in the spirit of freedom. Yes, we are aware that you have many positive aspects to your personality, which we respect and relate to them.

During the course of your study, NIOS will treat you as the manager of your own learning. This is why your course material has been developed keeping in mind the fact that there is no teacher to teach you. You are your own teacher. Of course, if you have a problem, we have provided for a teacher at your Accredited Vocational Institution (AVI). I would advise you that you should always be in touch with your AVI for collection of study material, examination schedules etc. You should also always attend the Personal Contact Programmes and practical / Training sessions held at your study centres. These will give you the necessary hands on training that is very essential to master a vocational course.

Studying for a vocational course is different from any other academic course. Here, while the marks obtained in the examination will indicate your grasp on your subject knowledge, your real achievement will be when you are able to apply your vocational skills in the market. I hope that this skill-based learning will help you perform your tasks better .This course of two year duration Diploma in basic Rural Technology has been developed in colloboration with Vigyan Ashram, Pune. It is a multi skilled programme, which will expose you to a variety of skills. We hope that you will find it useful. On behalf of NIOS, I wish you the very best for a bright and successful future.

Dr. S. S. Jena, Chairman,

National Institute of Open Schooling

FROM THE DESK OF DIRECTOR .....

Dear Learner,

In the fast expanding world of activities, learning new skills has become a necessity. Learning and re-learning has become essential for all. In such an environment, vocational education has assumed great importance. Vocational education, as a stream of education, promotes skill development, and training of youth and directs them towards meaningful employment.

In keeping with the needs of the Learners, NIOS conducts Vocational Education Programmes in many areas through distance mode. These programmes include Agriculture, Home Science, Engineering & Technology, Computer Science, Health & Paramedical. The Courses offered in these areas are aimed at providing self employment & wage employment opportunities for NIOS learners.

Vigyan Ashram under the leadership of late Dr.S.S.Kalbag, developed Rural Technology course for rural youth. Over the years, this course turned many youth into successful entrepreneurs. NIOS accrediated this course as Diploma in Basic Rural Technology and adopted it for further replication through AVI. This course will provide self-confidence to you and a new path to your future. You may be destined for starting a small enterprise and build your own future. This is multi-skilled programme, which will expose you to variety of skills. It includes Rural Engineering (Construction), Agriculture & Animal husbandry, Our Home Environment and Health sections. This will help in identifying learner's preference for future vocation. We are confident that this course will prove to be beneficial to you.

We wish you all the best in your future career.

Dr. K. P. Wasnik ,Director (VE),

National Institute of Open Schooling

DIPLOMA COURSE IN BASIC RURAL TECHNOLOGY

Course Curriculum

Introduction

About 90% of the children, who enroll in the primary school, do not cross the Senior Secondary (SSC) barrier. It is not that these children are unfit for education, in fact, they are the major work force for India. They start many small enterprises, do agriculture, works as skilled workforce and contribute substantially to the progress of India. They have probably dropped out because our book based education system did not suit them and the children lost interest in all education. Very often the very thought of schooling and examination frightens them.

The country is faced with a large proportion of school dropouts and a corresponding problem of unemployment and under-performance in the unorganized sector. In the present changing world scenario, this is a great handicap to progress of country. We, therefore, need a system by which the problem will be treated at the grass root level.

The main cause of this dropout problem is that our education system is almost entirely book based and a large section of the students, both during and after the schooling, find the education incomprehensible and irrelevant.

The multi-skill content of the Basic Rural Technology Course with hands-on experience stimulates the intellect by going through concrete operations and then abstracting the concepts. It uses the 'learning while doing' system and is closely linked to services in the community. At the same time by giving a variety of skills usable in every day life, they open the door of modern technology to the youth, allowing them to form their preferences and know their aptitudes, thus enabling them to choose a career. It also improves their self-image and gives them confidence and hope for the future. The level of training, though basic, empowers them to start their own enterprise after a short (less than a year) stint with another enterprise in the field.

The Diploma in Basic Rural Technology is the right course for such students. This course will give learners self-confidence and give a new path to their future. Learners may be destined for starting a small enterprise and build their own future.

This multi-skill program, will expose the learners to a variety of skills. Learners will work in Engineering-Construction, Energy-Environment, Agricultural and Animal husbandry and Health sectors. This will help in identifying Learners preferences for future vocation. This program is based on philosophy of "Learning while doing'. Students will get training by working in real life environment. They will also learn basic skills like drawing, costing and project planning in DBRT program during their training.

Objectives of the Course & Scope

Diploma in Basic Rural Technology, comprising of theory & practical component, is intended to *give learners self-confidence and a new path to their future. Learners may be destined for starting a small enterprise and build their own future. This is multi-skill programme, which will expose them to variety of skills. Learners will works in Engineering-Construction, Energy-Environment, Agricultural and Animal husbandry, home and health sections. This will help in identifying Learner's preference for future vocation.*

The programme is based on philosophy of "Learning while doing'. Students will get training by working in real life environment. Learner will also learn basic skills like Drawing, Costing and Project Planning in DBRT programme. The main objectives of this course are:

- To train the students using 'Learning while Doing' Philosophy.
- To train them for income generation through self-employment.
- To train students in multi-skills.
- To train students in different technologies and transfer these technologies to the society through them.
- To involve students in various rural development activities as a project work, thus integrating rural development and Education.
- To make available various services to the community at the modest cost and giving real life training to the students.

Eligibility Criteria

The admission for Diploma in Basic Rural Technology is open to those who fulfill the following Criteria:-

- Class 8th passed (Any one, who is willing to work with hands, handle machinery or play with animals or likes to grow plants, is well suited for this course. Learner should have passed the 8th standard school examination, so that learner can read and write fluently, do simple calculations.)

Job Opportunities

After passing through this course, the students can do apprenticeship in one of the areas of his interest and develop his career. Multiskilling helps in getting job in the following fields:-

1. Workshop in small scale industries / construction sites / Fabrication units.
2. Supervisor in agriculture and polyhouses / animal husbandry units such as poultry , dairy, goat farming etc.
3. In food processing industries.
4. Electric and Electronics workshops.

He can start his own enterprise after sufficient apprenticeship.

Duration of the Course

The duration of the course is two years. However, one can complete the course within five years of registration by appearing in any external examination as per rules of NIOS in force from time to time. The AVIs will be responsible for imparting training skills and competencies of a qualitative standard by adopting suitable training methods, strategies & systems.

Attachment of Trainees : Minimum 06 months attachment of trainee for internship.

Scheme of Study : 30% in Theory & 70% in Practical

Programme	Duration	Essential Contact Hrs. for Theory & Practical Training
Diploma in Basic Rural Technology	Two Years	600

Course Curriculum

The course curriculum comprises of four modules having both theory & practical components.

Subjects/Papers for First Year	Subjects/Papers for final Year
• Module - 1: Our Health	• Module – 3: Rural Engineering *((Material, Mechanics, Drawing & Costing)*
• Module – 2: Agriculture & Animal Husbandry	• Module – 4: Our Home Environment (Home Environment Basics of Electricity)

Out of four modules two are related to the living world and two to the non-living. Home- Environment (related to human society), and Agriculture (Plant and animal Kingdom) give the skills related to clothing, food and health of the society. Agriculture covers the skills needed for production and preservation of food of both plant and animal origin, including care of plants/crops, birds and cattle and their breeding. The Engineering (material-joining, shaping and otherwise fabricating into usable things, including housing) and Energy-Environment (application of electricity and maintenance of Diesel, petrol and other IC Engines, non-conventional principles). The content though it looks formidable, is easily worked through because of the 'learning while doing' method. Of course the mastery depends on the student putting hard work for practice, for which ample opportunities are given. The students are encouraged to take on contract jobs involving these skills for practice and reinforcement.

The study material will be provided in the form of self-instructional print material and the practical component/training shall be provided to each student at the study centres(AVI's).

Medium of Instruction

The medium of instruction is English.

Instructional System

- Self instructional printed material
- Visual support system

- Assignments
- Face to face counseling at AVIs/Study centres
- Practical/Training facilities at AVIs/Study centers
- On the job training, wherever applicable/required.

Scheme for Evaluation/Certification

There will be evaluation of both components, the theory as well as the practical separately. Internal assessment will also be taken into account while computing final result. The scheme of Assessment, Evaluation and Certification will be administrated through the guidelines designed by NIOS. NIOS will award the final certificate according to its rules and regulations.

Basic Rural Technology Training Prog.	**Theory**		**Practical**			
Paper	Max. Marks	Duration	Max. Marks In Practicals	Duration	Max. Marks in Project Work	Total
Paper – I Our Health	30	1 hr	50	2 hrs	20	100
Paper – II Agriculture & Animal Husbandry	30	1 hr	50	rs	20	100
Paper – III Rural Engineering (*(Material, Mechanics, Drawing & Costing)*	30	1 hr	50	2 hrs	20	100
Paper – IV Our Home Environment	30	1 hr	50	2 hrs	20	100
					Grand Total	400

MINIMUM PASSING CRITERIA

- In Theory, a trainee should secure 40% marks in each module/paper.
- In Practicals, a trainee, should secure 50% marks in each paper.
- In Internal Assignment, a trainee should secure 50% marks in each paper.

Procedure for Internal continuous Assessment

Practical / Training (Internal Assignments):

Assessment will be done by maintaining progress card of each candidate, indicating assessment of each Practical / experiments. (Total Marks = 80)

Course Fees:

A student will pay Rs.4000/- (Rs.500/- + Rs. 3,500/-) for the full course and will receive a set of printed material. In addition, the examination fee will be paid separately as per the NIOS rules.

Admission Procedure

Admission is done twice a year as per the dates notified by the NIOS. Application forms and Prospectus can be procured from either the NIOS or its Study Centrs (AVIs).

Criteria/Norms for Accreditation

The institutions having the following basic infrastructure may apply for accreditation:

(A) **Basic Infrastructure:**

1. Class Room: Classroom to accommodate 25 students (minimum area 225Sq. ft.) should have black board/white board, proper ventilation, adequate lighting, furniture, exhaust and ceiling fans etc.
2. One Lab: The Lab to accommodate 25 students (minimum area at least 20 ft. × 25 ft.) should have black board/white board, proper ventilation, adequate lighting, furniture, exhaust and ceiling fans etc.
3. One Workshop: The workshop to accommodate 25 students (minimum area at least 20 ft. × 25 ft.) should have black board/white board, proper ventilation, adequate lighting, furniture, exhaust and ceiling fans etc.
4. Agriculture land: Agriculture land for growing and cultivation the plants/crops.
5. Tools/ Environment: Details in this regard is available on our website.

Library: Library should have minimum 20 books/articles/magazines etc. related subject.

(B) Faculty & Supporting Staff

S.No.	Faculty & Supporting Staff	Educational/Professional Qualification	No.
1.	Coordinator	Graduate	01
2.	Instructor (part time)	Degree/Diploma in Nursing	01
3.	Instructor – Agriculture & Animal Husbandry	Degree/Diploma in Agriculture/Animal husbandry-DBRT with sufficient practical experience.	01
4.	Instructor – Engineering	Degree/Diploma in Engineering discipline – ITI-DBRT with sufficient practical experience.	01

5.	Instructor – Food lab.	Class 12th Pass – Home science or DBRT with practical experience in food processing	01
6.	Receptionist cum clerk	Relevant to job	01

Batch Size – Maximum 25 students in one batch.

Basic Rural Technology

1

OUR HEALTH

COURSE CONTENT

1

INTRODUCTION OF HUMAN BODY

1.1 INTRODUCTION

Man is the most intelligent and technologically advance living thing on earth. We have known about our gross body for centuries. Now, in this lesson we will understand how it looks from inside and how it performs its functions. The basic knowledge of structure, size, shape, location and functioning of various organs of the human body is provided by two important subjects-Human Anatomy and Physiology which one must study first to understand our body.

1.2 OBJECTIVES

After reading this lesson, you will be able to:

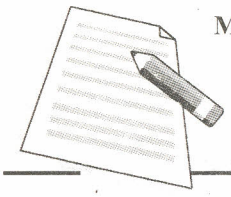
- Get the knowledge of structure and function of a healthy human body.
- Understand the meaning of Anatomy and Physiology.
- Know the important systems of human body.
- Explain the functions and contribution of each system.

1.3 ANATOMY AND PHYSIOLOGY

Now, let us find out what does 'Anatomy' and 'Physiology' mean.

Anatomy is the science which deals with the study of normal structure, shape, size and location of various parts of the body.

When the study relates to human body it is called human anatomy. For example, when we look at our body we can easily see that it has one face, two hands, two legs etc. and there is skin that completely covers the body. When we open or see inside our body, what do you observe?



Module-1

Notes

We can see that internally it is composed of various organs, blood, muscles, bones etc. In this way, in anatomy we can study various structures and composition of our body.

Physiology is the study of normal functions of various organs of the body i.e. how each and every part of the body and body as a whole, perform its function?

INTEXT QUESTIONS 1.1

1. Define Anatomy.

2. Define physiology.

1.4 INTRODUCTION TO THE BODY AS A WHOLE

Man is a multi-cellular organism. The smallest functional unit of the body is **cell**. The cells of the body are too small to be seen with the naked eye.

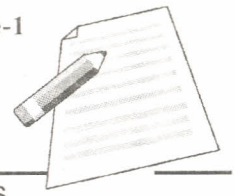
Groups of cells which have same physical characteristics tend to have similar functions. A large number of cells grouped together to perform same functions are called **tissues.**

An **organ** is a collection of various tissues to form a structure, to serve a specific function.

An **organ system** consists of various organs which coordinately perform a major function of the body.

Each system contributes to one or more vital functions of the body. However, because of specialization of cells, none of the systems can exist in isolation.

To summarize, in our body there are various systems which work in coordination to perform important functions. Each system is composed of different organs which work together for a particular system. Each organ is made up of various tissues and different tissues have number of cells, which is the smallest functional unit of the body.



Human Body – Organ system – Organs – Tissues – Cells

Do you know that there are nine different systems in our body?

The important systems of the human body are:

1. **Skeleton system**
2. **Muscular system**
3. **Digestive system**
4. **Respiratory system**
5. **Circulatory system**
6. **Excretory system**
7. **Endocrine system**
8. **Nervous system**
9. **Reproductive system**

INTEXT QUESTIONS 1.2

Answer in one word please:

1. The smallest functional unit of the body is: _____
2. The collection of various tissues is known as: _____
3. The total number of systems in our body are: _____

1.5 IMPORTANT SYSTEMS OF HUMAN BODY

(A) SKELETON SYSTEM

The skeleton system (also known as the Bony system) consists of bones and cartilage.

The skeleton is the framework of bones which are organized to form distinct parts such as skull, vertebral column, thoracic cage, hands and legs. The joints give the movements to the bones. Bones have great tensile strength, almost as high as that of cast iron.

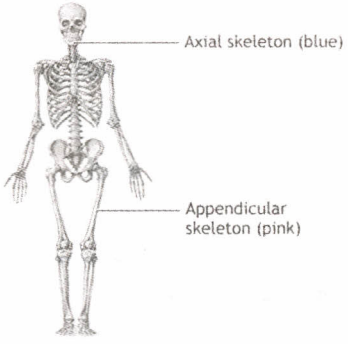


Fig. 1.1 Skeleton

Module-1

Notes

There are different types of bones in our body:

Long, short, flat and irregular bones.

The skeleton system consists of 206 bones in human.

Functions

The skeleton system performs following functions:

1. It gives framework to the body.
2. It gives shape and posture to the body.
3. The primary purpose of skeleton is to support the body.
4. It protects the soft and delicate organs like heart, lungs, brain etc.
5. It also permits necessary movements and locomotion.

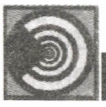
(B) THE MUSCULAR SYSTEM

There are a large number of muscles (about 500) that help in movement of our body. The muscles bring about movement and locomotion of various organs and parts of the body.

Functions

The main functions of muscles are:

1. They help in movement and locomotion of various organs and parts of the body.
2. They give shape to the body.
3. They provide protection to the internal organs of the body, for example- muscles of the abdomen form a strong muscular anterior wall of the abdominal cavity.
4. Muscles help in various important internal processes of the body like respiration, urination, circulation, changing facial expression etc.
5. Muscles store glycogen, which is used as energy during movements of the muscles.



INTEXT QUESTIONS 1.3

1. Fill in the blanks:

   a) The skeleton system consists of _____ and _____.

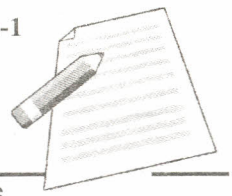
   b) There are _____ bones in our body.

   c) Muscles help in _____ and _____.

   d) Muscles store _____.

(C) THE DIGESTIVE SYSTEM

To do any kind of work, our body needs energy. This energy comes from the food that we eat. The process of digestion can be defined



as the breakdown of big and complex food particles into smaller and simpler form so that it is suitable for absorption. The food that we eat, has to be converted into simpler form through a series of changes which release its constituent nutrients i.e. proteins are converted into amino acids, carbohydrates into starch and fats into fatty acid. These changes occur with the help of enzymes, which are secreted into the alimentary canal by special glands.

Enzymes are chemical substances that causes, or speeds up a chemical change in other substances without itself being changed.

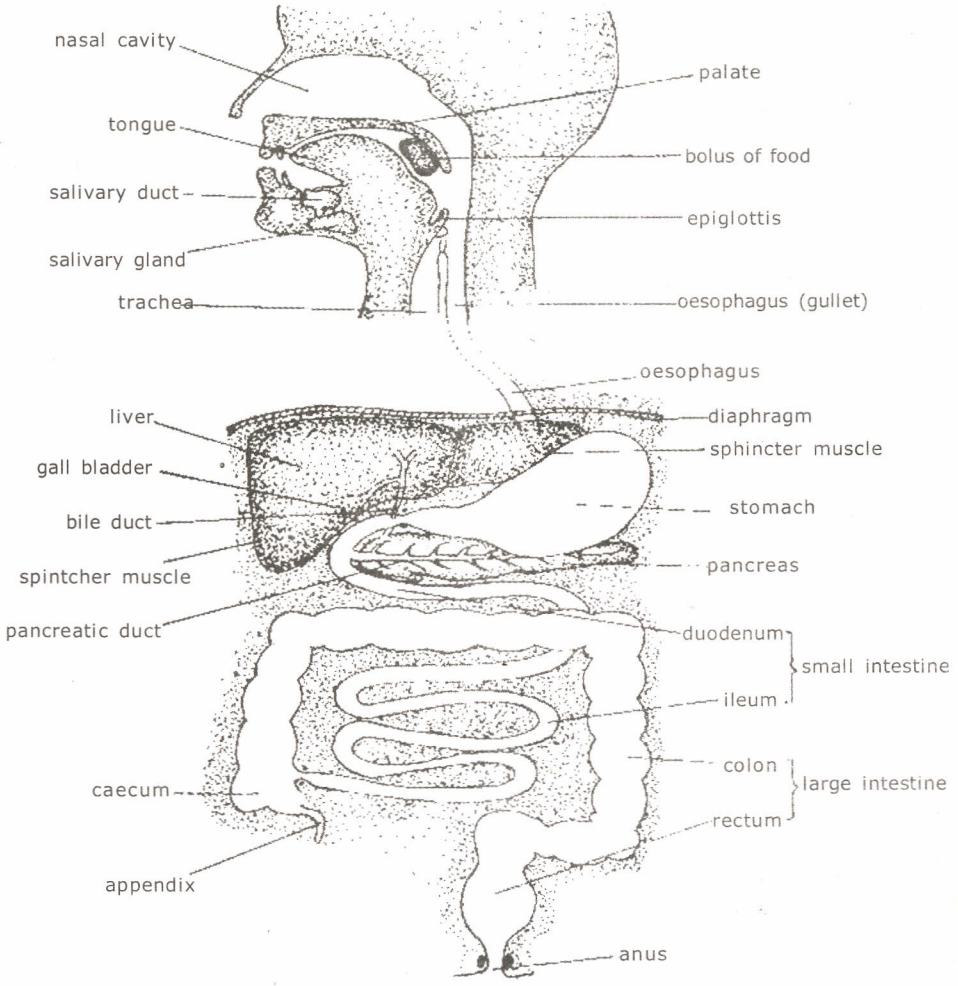


Fig.1.2 Organs of the digestive system

Organs of the digestive system:

Digestive system mainly consists of alimentary canal, which is a long tube like structure through which food passes. It begins at the mouth and terminates at the anus. Various organs of digestive system are:

Mouth (food is taken in by mouth)

↓

Notes

Oesophagus (or food pipe)

↓

Stomach

(Digestion of food takes place with the help of gastric juice which is Secreted from the stomach)

↓

Small intestine

(Further breakdown or digestion of food takes place with the help of bile and some enzymes)

↓

Large intestine

(The digested food particles are absorbed in the blood and some of the water and electrolytes are removed from the food)

↓

Rectum

(The solid waste material is temporarily stored here)

↓

Anus

(It is an opening from where waste materials are excreted out as faeces)

(D) THE RESPIRATORY SYSTEM

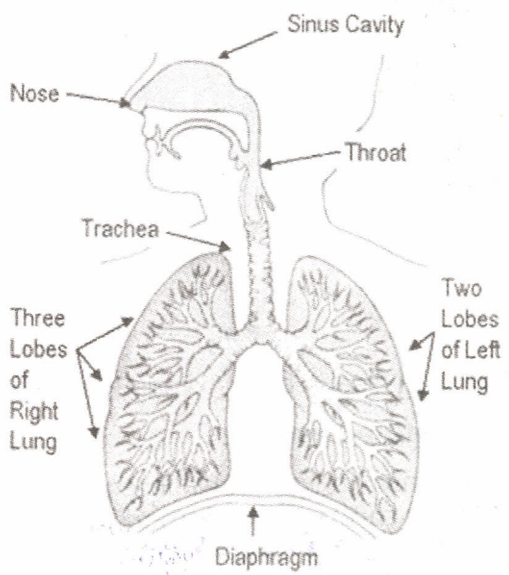
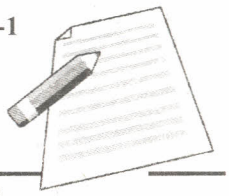


Fig. 1.3 Organs of the respiratory system



The respiratory system provides the route through which 'oxygen' – which is present in the atmosphere, enters inside the body and carbon dioxide isexcreted out from the body.

The exchange of gases between the blood and the lungs is called external respiration and that between the blood and the cells is known as internal respiration.

The organs of the respiratory system are:

Nose: It is the first of the respiratory organs and consists of a large irregular nasal cavity, divided into two equal parts (i.e. right and left nostril) by a septum.

Pharynx: It is a tube like structure that lies behind the nose and mouth.

Larynx: It is a small chamber situated in the region of neck. It is also known as 'voice box', since it helps in the production of sound.

Trachea: It is also known as windpipe and is a continuation of the larynx. It extends downward and divides or bifurcates into the right and left bronchi, one bronchus going to each lung.

Two bronchi: The two bronchi enter into right and left lungs of either side. Inside the lungs, they are further divided into many smaller bronchioles and finally into alveoli.

Two Lungs: There are two lungs, one lying on each side of the midline in the thoracic cavity. They are cone-shaped. Each lung is covered by a layer called 'pleura' which contains a fluid called pleural fluid.

Muscles of respiration i.e. the intercostals muscles and the diaphragm.

(E) THE CIRCULATORY SYSTEM

The circulatory or the blood circulatory system consists of the heart, which acts as a pump and the blood vessels through which the blood circulates. The main blood vessels are Arteries, veins and capillaries.

Arteries are the blood vessels that carry blood away from the heart.

Veins are the blood vessels that transport blood to the heart.

The smallest arterioles break up into a number of minute vessels called **capillaries.**

Heart

The heart is a cone-shaped hollow muscular organ. It is situated in the thoracic cavity in between the lungs, a little more to the left than the right. Interior of the heart is divided into a right and