

**MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION , MUMBAI**

**TEACHING AND EXAMINATION SCHEME**

**COURSE NAME : DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY**

**COURSE CODE : ML**

**DURATION OF COURSE : SIX SEMESTERS/THREE YEARS**

**WITH EFFECT FROM 2009 - 10**

**SEMESTER : SIXTH**

**DURATION : (16 WEEKS)**

**FULL TIME / PART TIME: FULL TIME**

**SCHEME - C**

SR. NO.	SUBJECT TITLE	SUBJECT CODE	TEACHING SCHEME			EXAMINATION SCHEME											
			TH	TU	PR	PAPER HRS	TH		TEST	TOTAL		PR		OR		TW	
							Max	Min		Max	Min	Max	Min	Max	Min		
1	Medical Parasitology	9503	03	--	02	03	80	28	20	100	40	50@	20	--	---	--	--
2	Applied Biochemistry	9504	03	--	04	03	80	28	20	100	40	50@	20	--	--	--	--
3	Clinical Pathology	9505	04	--	04	03	80	28	20	100	40	50#	20	--	--	25@	10
4	Advance Hematology	9506	03	--	04	03	80	28	20	100	40	50@	20	--	--	--	--
5	Immunology	9507	03	--	02	03	80	28	20	100	40	50#	20	--	--	25@	10
6	Professional Practices - III	--	--	--	03	--	--	--	--	--	--	--	--	--	--	50@	20
<b>TOTAL</b>			<b>16</b>	<b>--</b>	<b>19</b>	<b>--</b>	<b>400</b>	<b>--</b>	<b>100</b>	<b>500</b>	<b>--</b>	<b>250</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>100</b>	<b>--</b>

**STUDENT CONTACT HOURS PER WEEK (FORMAL TEACHING) : 35 HRS.**

**THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.**

@ - INTERNAL ASSESSMENT, # - EXTERNAL ASSESSMENT.

**TOTAL MARKS – 850**

ABBREVIATIONS : TH – THEORY , TU – TUTORIAL , PR – PRACTICALS , OR –ORAL, TW – TERMWORk

**All Practical, Oral and Term Work assessment are to be done as per the prevailing norms for implementation and assessment.**

**COURSE NAME : DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY**

**COURSE CODE : ML**

**SEMESTER : SIXTH**

**SUBJECT TITLE : MEDICAL PARASITOLOGY**

**SUBJECT CODE : 9503**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	-	02	03	80	20	50@	-	-	150

**RATIONALE:**

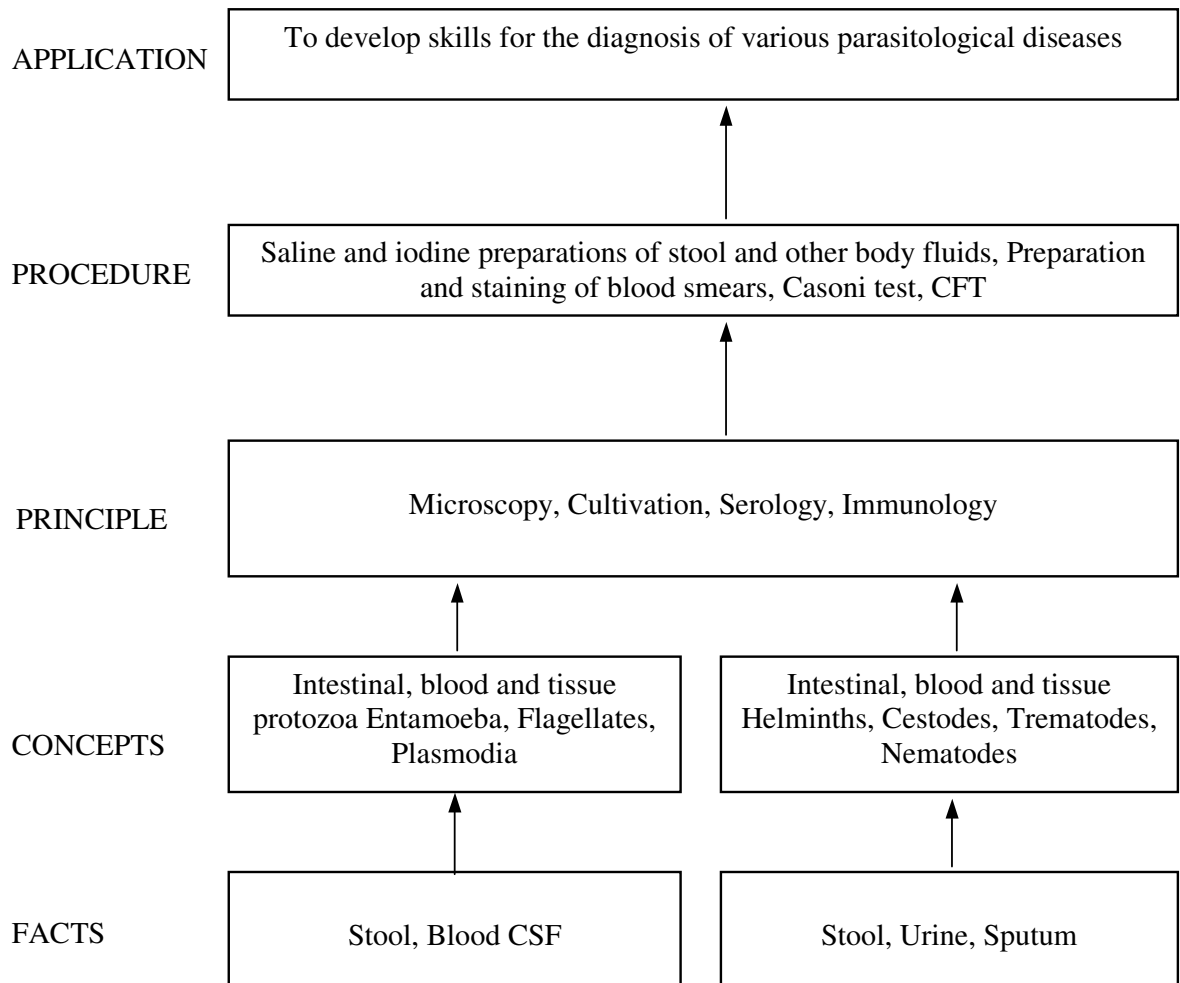
A knowledge of medical parasitology is essential to many branches of medicine as well as to all life sciences. Since the pathogenic parasites cause variety of Human diseases ranging from a protozoal amobiasis to fatal cerebral malaria, involving imp organs like intestine but also urogenital tract, liver muscle and other organs. Therefore a Technologist must have the thorough knowledge of various tests performed in the lab for diagnosis of various diseases so that he can help to physician to find out the cause of disease and also can help society to prevent spread of epidemics.

**OBJECTIVES:**

The student will be able to:

- 1) Use laboratory diagnosis procedures of common parasitological diseases.
- 2) Carry out routine pathological investigations.

**Learning Structure:**



**CONTENTS: THEORY**

<b>Chapter</b>	<b>Name of the topic</b>	<b>Marks</b>	<b>Hours</b>
<b>1</b>	<b>PROTOZOA - MORPHOLOGY, LIFE CYCLE, PATHOGENESIS AND LAB. DIAGNOSIS OF FOLLOWING PROTOZOA</b> 1.1 Intestinal - Entamoeba hystolytica and Entamoeba coli. 1.2 Intestinal and genital flagellates i) Giardia intestinalis ii) Trichomonas vaginalis. 1.3 Blood and tissue flagellates i) Leishmania donovanii ii) Trypanosoma cruzi 1.4 Plasmodium vivax, plasmodium falciparum.	<b>24</b>	<b>15</b>
<b>2</b>	<b>HELMINTHS TREMATODES - MORPHOLOGY, LIFE CYCLE, PATHOGENESIS AND LAB DIAGNOSIS OF</b> 2.1 Intestinal trematode fasciola hepatica. 2.2 Blood and tissue trematodes. i) Paragonimus westermani. ii) Schistosoma haematobium.	<b>16</b>	<b>09</b>
<b>3</b>	<b>HELMINTHS, CESTODES - MORPHOLOGY, LIFE CYCLE PATHOGENISITY AND LABORATORY DIAGNOSIS OF</b> 3.1 Taenia solium 3.2 Taenia saginata 3.3 Echinococcus granulosus 3.4 Hymenolepis nana	<b>16</b>	<b>09</b>
<b>4</b>	<b>HELMINTHS, NEMATODES - MORPHOLOGY, LIFE CYCLE, PATHOGENISITY AND LABORATORY DIAGNOSIS OF</b> <b>Intestinal Nematodes</b> 4.1 Ascaris Lumbricoidus 4.2 Ankylostoma duodenale 4.3 Enterobius Vermicularis 4.4 Trichuris trichiura 4.5 Strongyloides stercolaris <b>Blood and tissue nematodes</b> 4.5 Wuchereria bancrofti 4.6 Drancunculus medinensis	<b>24</b>	<b>15</b>
<b>Total</b>		<b>80</b>	<b>48</b>

## **Practical:**

### **Skills to be developed**

#### **1) Intellectual Skills**

- To know and understand the principles of immunological and serological tests for confirmation of laboratory diagnosis.
- Interpretation of test Results.

#### **2) Motor Skills**

- Identification and differentiation of stained and unstained preparation.
- Ability to record the distinguishing morphological features of pathogenic parasites.

### **List of Practical:**

1. Collection and handling of faecal specimen.
2. Gross examination of faecal specimen for parasites.
3. Concentration methods of stool for ova and cyst.
  - i) Formol ether
  - ii) Zinc sulphate floatation technique.
4. Preparation of stained and unstained slide for detection of larvae/ova or cyst of parasites.
5. Malarial parasite Detection
  - i) Preparation of thick Blood film field's stain. Examination of thick Blood film for detection of Malarial parasites.
  - ii) Preparation of thin Blood film. Leishman stain. Examination for Malarial parasites.
  - iii) Preparation of Thick and Thin Blood film on same slide and examination of slide after staining for detection of malarial parasites.
6. Demonstration of following parasites. Ova/cyst under microscope
  - a) Giardia Lamblia b) T. Vaginalis c) Roundworm d) Hookworm e) whipworm
  - f) Tapeworm g) Threadworm

## Learning Resources

### Books:

<b>Sr. No.</b>	<b>Title</b>	<b>Name of Author</b>	<b>Name of Publisher</b>	<b>Year of Publication</b>
01	Medical laboratory manual for tropical countries vol. I and II	Monica Cheesbrough	Bitterworth and co. (publisher) Ltd. Borough Green sevenoaks Kent	1985
02	A text book of microbiology	P. Chakraborti	New central book agency (p) Ltd. 8/1 Chitamony Das Lane Kolkata	1995 1 <sup>st</sup> Ed.
03	Medical lab technology vol. I and vol. IIs	Robert Cruikshamketall	Churchill Livingstone Edinburgh London and Newyork.	1998 12 <sup>th</sup> Ed.
04	Medical lab Technology	Dr Ramnik Sood	Jaypee Brothers, New Delhi	--

**COURSE NAME : DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY**

**COURSE CODE : ML**

**SEMESTER : SIXTH**

**SUBJECT TITLE : APPLIED BIOCHEMISTRY**

**SUBJECT CODE : 9504**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	-	04	03	80	20	50@	-	-	150

**RATIONALE:**

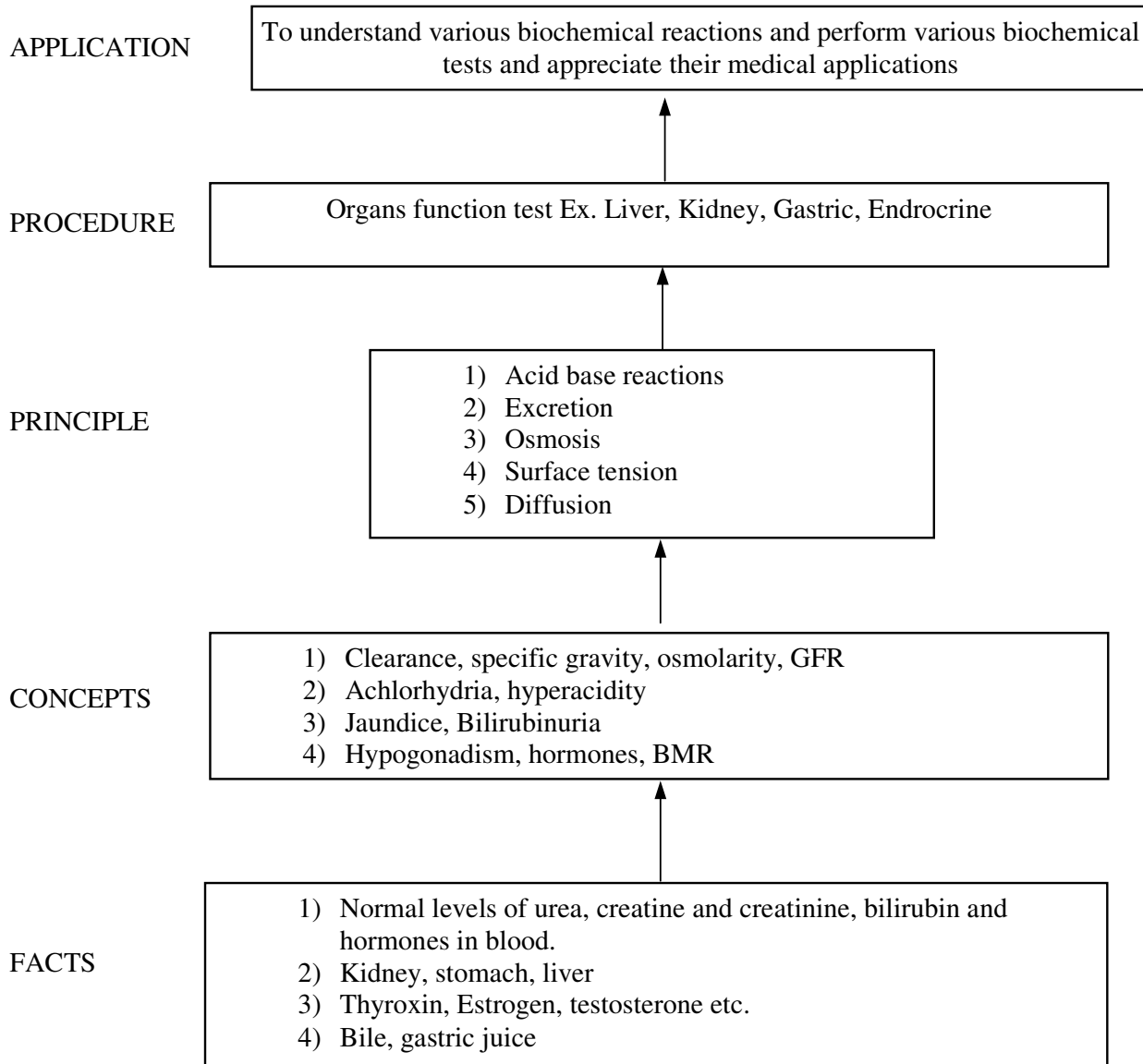
Biochemistry is a science concerned with the chemical constituents of living cells and with the reactions and processes they undergo. Abnormalities in the chemical constituents are exhibited by various diseases. Therefore a technologist must have the knowledge of Clinical Biochemistry. So that he can understand the principle behind the biochemical reactions and can work in the laboratory with confidence.

**OBJECTIVES:**

Students will be able to:

- 1) Know disease is at molecular level.
- 2) Sstudy the chemical components of the body.
- 3) Use procedure and application of detection of biomolecules in clinical specimen like blood, urine, CSF and other body fluids.
- 4) Detect abnormal constituent and does will be able to know the cause of diseases.

## Learning Structure:



**CONTENTS: Theory**

<b>Chapter</b>	<b>Name of the Topic</b>	<b>Marks</b>	<b>Hours</b>
<b>1</b>	<b>KIDNEY FUNCTION TEST</b> 1.1 Clearance Test 1.2 Water function Test, Specific gravity and osmolarity of Urine. 1.3 Determination of Non Protein Nitrogen (NPN) in blood. 1.4 Foreign substance Test.	<b>20</b>	<b>13</b>
<b>2</b>	<b>HEPATIC FUNCTION TEST</b> 2.1 Test based on role of liver in carbohydrate. Lipid and Protein metabolism. 2.2 Bile pigment metabolism, serum bilirubin level and Icteric index. 2.3 Jaundice. 2.4 Bilirubinuria	<b>20</b>	<b>12</b>
<b>3</b>	<b>GASTRIC FUNCTION TEST</b> 3.1 Collection of gastric juice, normal and abnormal constituent of gastric juice, Gastric juice analysis (physical examination and chemical analysis) 3.2 Abnormalities - Achlorohydria, Hyperacidity, Gastrica achliya	<b>16</b>	<b>08</b>
<b>4</b>	<b>ENDOCRINE FUNCTION TEST</b> 4.1 Pituitary gland hormone and their function. 4.2 Thyroid hormone - Abnormality and function test 4.3 Adrenal Hormone - <b>Medula</b> - VMA, ELISA, RIA <b>Cortex</b> 17 - Kelosteroid, ELISA, RIA	<b>24</b>	<b>15</b>
<b>Total</b>		<b>80</b>	<b>48</b>

**Practical:****Skills to be developed****1) Intellectual Skills**

- Ability to identify normal and abnormal constituent of body fluids.
- Ability to select proper instruments for analysis, estimation.
- Interpretation of the results.

**2) Motor Skills**

- Preparation and standardization of volumetric solutions.
- Application of Principle, Procedure that is methodology of varies estimation.
- Accuracy in result.
- Ability to plot the graph and to find out normal and abnormal values.

**List of Practical:**

1. Determination of blood urea nitrogen by Diacetyl monoxime method.
2. Determination of blood creatinine.
3. Determination of urine creatinine.
4. Determination of Alkaline phosphatase activity.
5. Determination of acid phosphatase activity.
6. Estimation of direct and indirect bilirubine.
7. Pregnancy Test.

**Learning Resources:**

**Books:**

Sr. No.	Title	Name of Author	Name of Publisher
01	Fundamentals of Biochemistry	Deb and Deb	New central agency chinamanidas Lane Calcutta
02	Text book of Biochemistry (2nd)	Ramkrishman, Prapannan, Rajan	Orient Longman Ltd. 160, Anna Salai, Madras.
03	Test book of (8th) Biochemistry	Rama Rao	L.K. & S. Publication Visakhapatnam
04	Hand book of Biochemistry	Siddiqui M.A.	Scientific Book Company
05	Comprehensive viva and practice in biochemistry	Deb and Deb	New central agency Chinamanidas Lane Calcutta
06	Fundamental of Biochemistry	J.L. Jain	S. Chand & Company Ram Nagar, New Delhi
07	Practical Biochemistry for students	Malhotra Varun Kumar	Jaypee Brothers New Delhi

**COURSE NAME : DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY**

**COURSE CODE : ML**

**SEMESTER : SIXTH**

**SUBJECT TITLE : CLINICAL PATHOLOGY**

**SUBJECT CODE : 9505**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
04	-	04	03	80	20	50#	-	25@	175

**RATIONALE:**

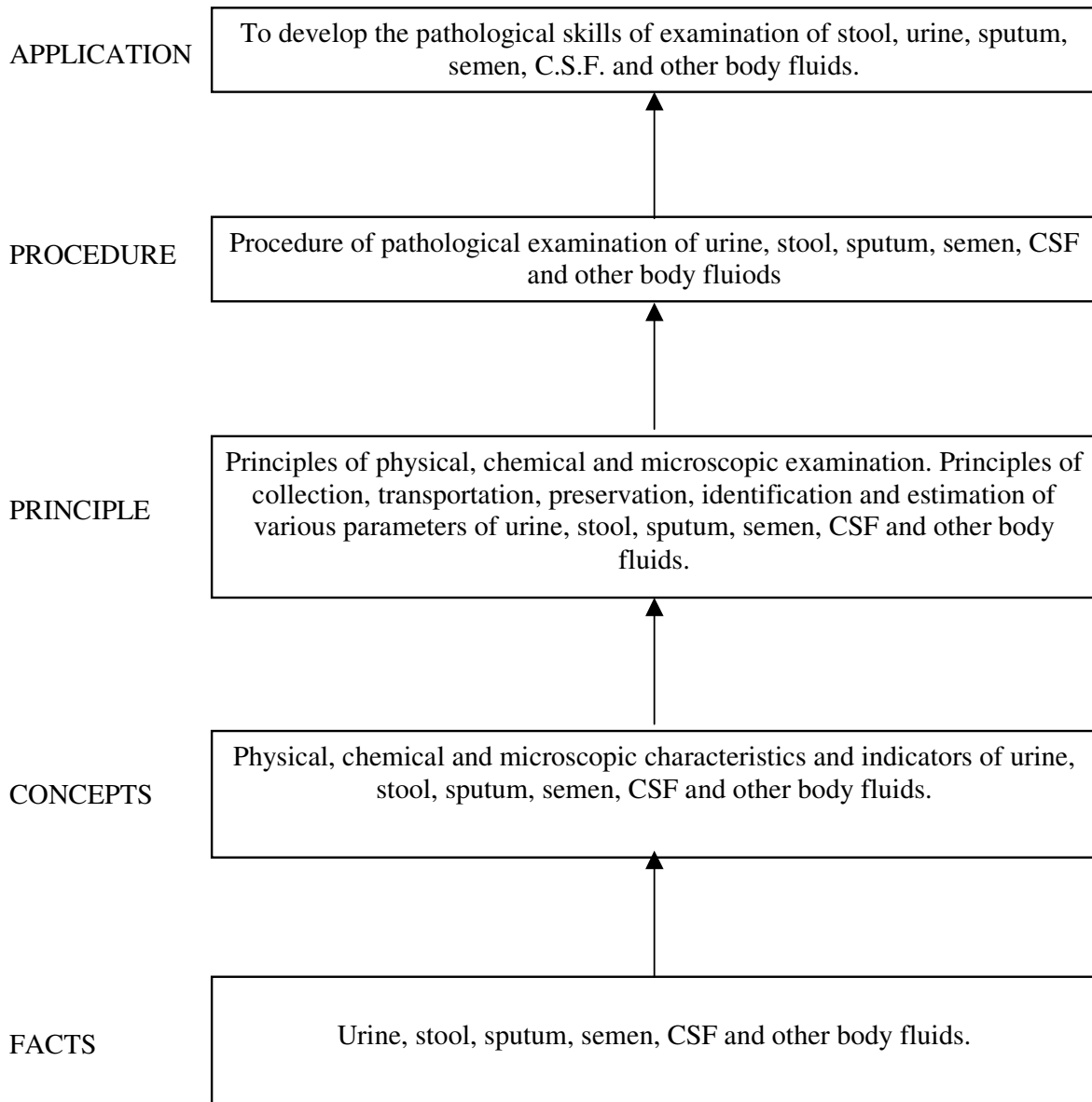
The principles and techniques of Pathology have a wide application in many branches of medicine. It is a basic subject which deals with examination of various body Fluids/Excreta for presence of multiple factors like chemical, biological and Physical as cause or effect of illness.

**OBJECTIVES:**

The student will be able to:

- 1) Carry out routine pathological investigation.
- 2) Use clinical pathological techniques.
- 3) Interpret various results.

**Learning Structure:**



**CONTENTS: Theory**

<b>Chapter</b>	<b>Name of the topic</b>	<b>Marks</b>	<b>Hours</b>
<b>1</b>	<b>EXAMINATION OF URINE</b> 1.1 Indication, collection, container transportation, preservation of urine for different types of urine analysis. 1.2 Physical examination of urine and its significance 1.3 Chemical examination of urine and its significance 1.4 Microscopic examination of urine and its significance	<b>16</b>	<b>10</b>
<b>2</b>	<b>EXAMINATION OF STOOL</b> 2.1 Indications, collection, container, transportation, preservation for different types of stool analysis 2.2 Physical examination of stool and its significance 2.3 Chemical examination of stool and its significance 2.4 Microscopic examination of stool and its significance	<b>14</b>	<b>14</b>
<b>3</b>	<b>EXAMINATION OF SPUTUM</b> 3.1 Indications, collection, container, transportation, preservation for different types of sputum analysis 3.2 Physical examination of sputum and its significance 3.3 Chemical examination of sputum and its significance 3.4 Microscopic examination of sputum and its significance. Gram staining and Ziehl-Neelson staining procedure.	<b>12</b>	<b>14</b>
<b>4</b>	<b>EXAMINATION OF C.S.F. AND OTHER BODY FLUIDS LIKE PLEURAL FLUID, PERITONEAL FLUID, SYNOVIAL FLUID, PERICARDIAL FLUID AND ASCITIC FLUID.</b> 4.1 Indications, collection, container, transportation, preservation for different types of examination of C.S.F./other body fluids 4.2 Physical examination of C.S.F. and body fluids and its significance 4.3 Chemical examination of C.S.F. and other body fluids and its significance	<b>22</b>	<b>16</b>

	4.4 Microscopic examination of C.S.F. and other body fluids and its significance		
<b>5</b>	<b>SEMEN ANALYSIS</b>		
	5.1 Indications, collection, container, transportation, preservation for different types of semen examination.		
	5.2 Physical examination of semen and its significance	<b>16</b>	<b>10</b>
	5.3 Chemical examination of semen and its significance		
	5.4 Microscopic examination of semen and its significance		
	<b>Total</b>	<b>80</b>	<b>64</b>

**Practical:**

**Skills to be developed:**

**1) Intellectual Skills**

- To develop the pathological skills of examination of urine, stool, sputum, semen, C.S.F., Fluid
- Searching information of multiple factors like chemical, biological and physical as the cause or effect of illness.
- Reporting skills.

**2) Motor Skills**

- Use of appropriate instrument like microscope, microtome.
- Collection transportation and preservation of different specimens.
- Identification, examination and estimation of various parameters of urine, stool, sputum, semen, CSF, and Fluids.

**List of Practicals:**

1. Routine examination of urine specimen.
2. Routine examination of stool for demonstration of OVA and CYSTS.
3. Routine examination of sputum, Gram staining and Ziehl-Neelson staining for demonstration of bacteria.
4. Routine examination of CSF and other body fluids.
5. Routine examination of semen.

**Learning Resources:****Books:**

<b>Sr. No.</b>	<b>Title</b>	<b>Name of Author</b>	<b>Name of Publisher</b>	<b>Year of Publication</b>
01	Medical laboratory techniques vol. I, II and III	K. Mukherji	Tata. McGraw Hill, Delhi, 5th Edition	1988
02	Pathological technology : clinical Pathology	G. Guru	Sec. National council of educational research and training, New Delhi, 1st Edition	1988
03	Clinical Pathology	S.S. Kelkar	Voral Medical Publications Mumbai, 1st Edition	1993
04	Manual of Medical Laboratory Technology	Ramnik Sood	Jaypee Brothers, New Delhi.	1985

**COURSE NAME : DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY**

**COURSE CODE : ML**

**SEMESTER : SIXTH**

**SUBJECT TITLE : ADVANCED HAEMATOLOGY**

**SUBJECT CODE : 9506**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	-	04	03	80	20	50@	-	-	150

**RATIONALE:**

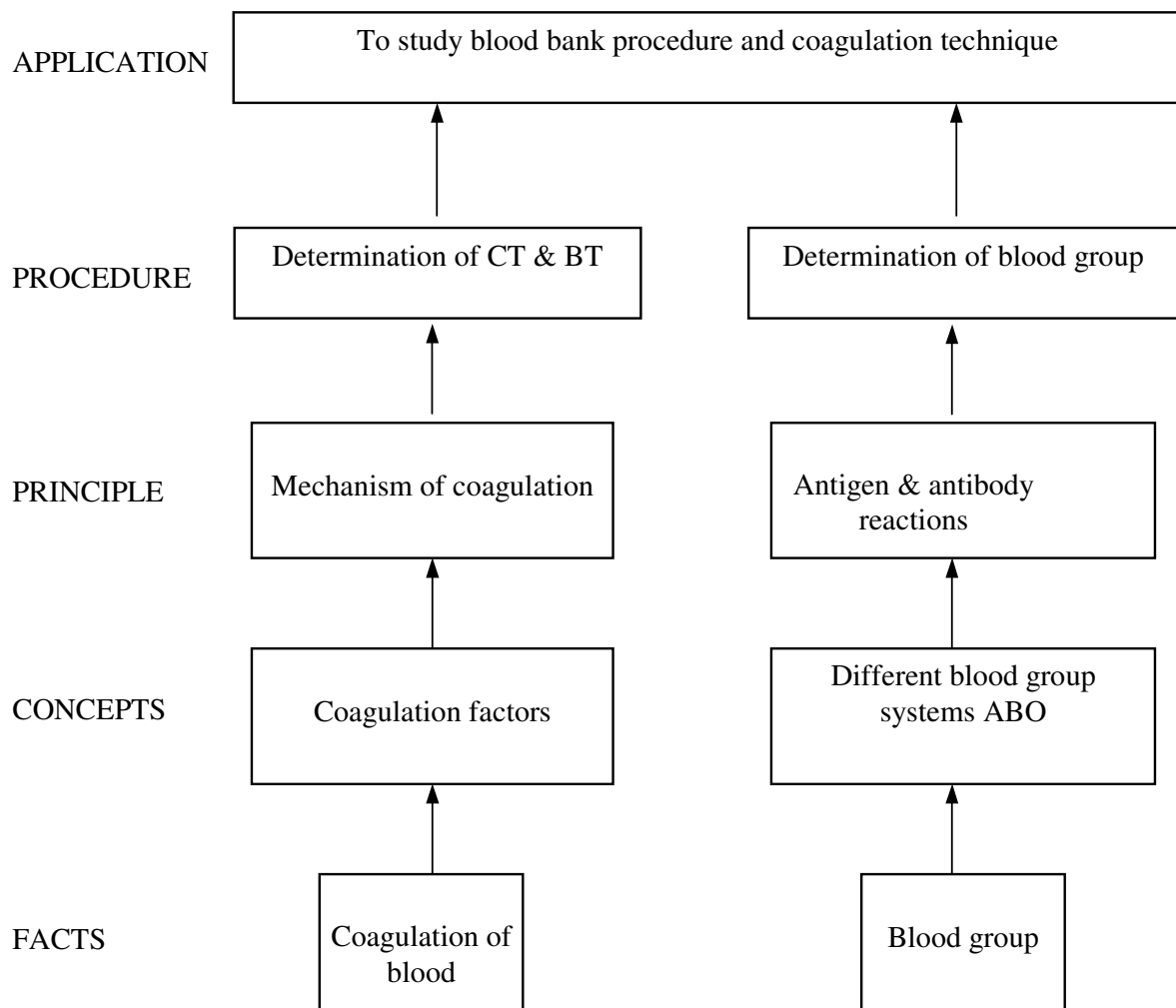
Blood Banking is a science which deals with collection testing & transfusion of blood & its products. It also deals with common blood bank procedures. Hence advanced haematology is included.

**OBJECTIVES:**

The student will be able to:

- 1) Perform routine blood bank procedures.
- 2) Prepare common blood bank documentation.
- 3) Identify blood groups.
- 4) Understand coagulation technique.

**Learning Structure:**



**CONTENTS: Theory**

<b>Chapter</b>	<b>Name of the topic</b>	<b>Marks</b>	<b>Hours</b>
<b>1</b>	<b>THROMBOCYTE (PLATELETS)</b> 1.1 Morphology, Properties & functions of platelets 1.2 Thrombopoiesis or development of Thrombocyte 1.3 Thrombocyte	<b>04</b>	<b>02</b>
<b>2</b>	<b>COAGULATION OF BLOOD</b> 2.1 Coagulation factors 2.2 Mechanism of Coagulation 2.3 Diseases that occur due to defect in coagulation e.g. deficiency of prothrombin, Haemophilia, Pseudo-haemophilia 2.4 Investigations in haemorrhagic disorder a) Hess Capillary test b) Platelet count c) Determination of Prothrombin Time	<b>20</b>	<b>13</b>
<b>3</b>	<b>HAEMOGLOBIN PATHIES</b> 3.1 Definition 3.2 Sickle haemoglobinopathies 3.3 Investigations in sickle Haemoglobinopathies like sickling test, Hbs solubility test, Haemoglobin Electrophoresis 3.4 Thalassaemia - definition, classification	<b>18</b>	<b>10</b>
<b>4</b>	<b>BLOOD GROUP</b> 4.1 Different blood grouping system 4.2 ABO blood group systems 4.3 Bombay blood group 4.4 Rh factor 4.5 Clinical significance of blood group 4.6 Complications of mismatched blood transfusion. 4.7 Transfusions transmitted diseases.	<b>20</b>	<b>13</b>
<b>5</b>	<b>BLOOD BANKING PROCEDURE</b> 5.1 Organisation and planning of a blood bank 5.2 Documentation of blood banks. 5.3 Criteria for donor selection. 5.4 Collection & storage of blood. 5.5 Preparation & uses of blood components.	<b>18</b>	<b>10</b>
<b>Total</b>		<b>80</b>	<b>48</b>

## Practical:

### Skills to be developed

#### 1) Intellectual Skills

- Observing routine procedures of a blood bank.
- Understand documentation in blood bank.
- Skills to interpret results.
- Reporting skill.

#### 2) Motor Skills

- They should develop the skill of blood grouping and cross matching.
- They should develop the skill of making sickle cell preparation.
- They should develop the skill of identification of agglutination

### List of Practical :

1. Determination of Bleeding time
2. Determination of Clotting time
3. Haemoglobin solubility test
4. Sickling test
5. ABO grouping - cell grouping (slide and tube method)
6. ABO grouping - serum grouping (slide and tube method)
7. Rh typing. (slide and tube method)
8. Cross matching test. (slide and tube method)
9. Visit to blood bank

### Learning Resources:

#### Books:

Sr. No.	Title	Name of Author	Name of Publisher	Year of Publication
01	Medical Laboratory Technology Vol - I	Kanai L. Mukherjee	Tata McGraw Hill Pub. Co. Ltd. New Delhi	14th edition 2003
02	Haematology	John Dacie	Longman group Ltd , New York	8th edition 1995
03	Medical Lab technology	Profulla B. Godkar	Bhalani Publications house, Hyderabad	2nd edition 2003

**COURSE NAME : DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY**

**COURSE CODE : ML**

**SEMESTER : SIXTH**

**SUBJECT TITLE : IMMUNOLOGY**

**SUBJECT CODE : 9507**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	-	02	03	80	20	50#	-	25@	175

**RATIONALE:**

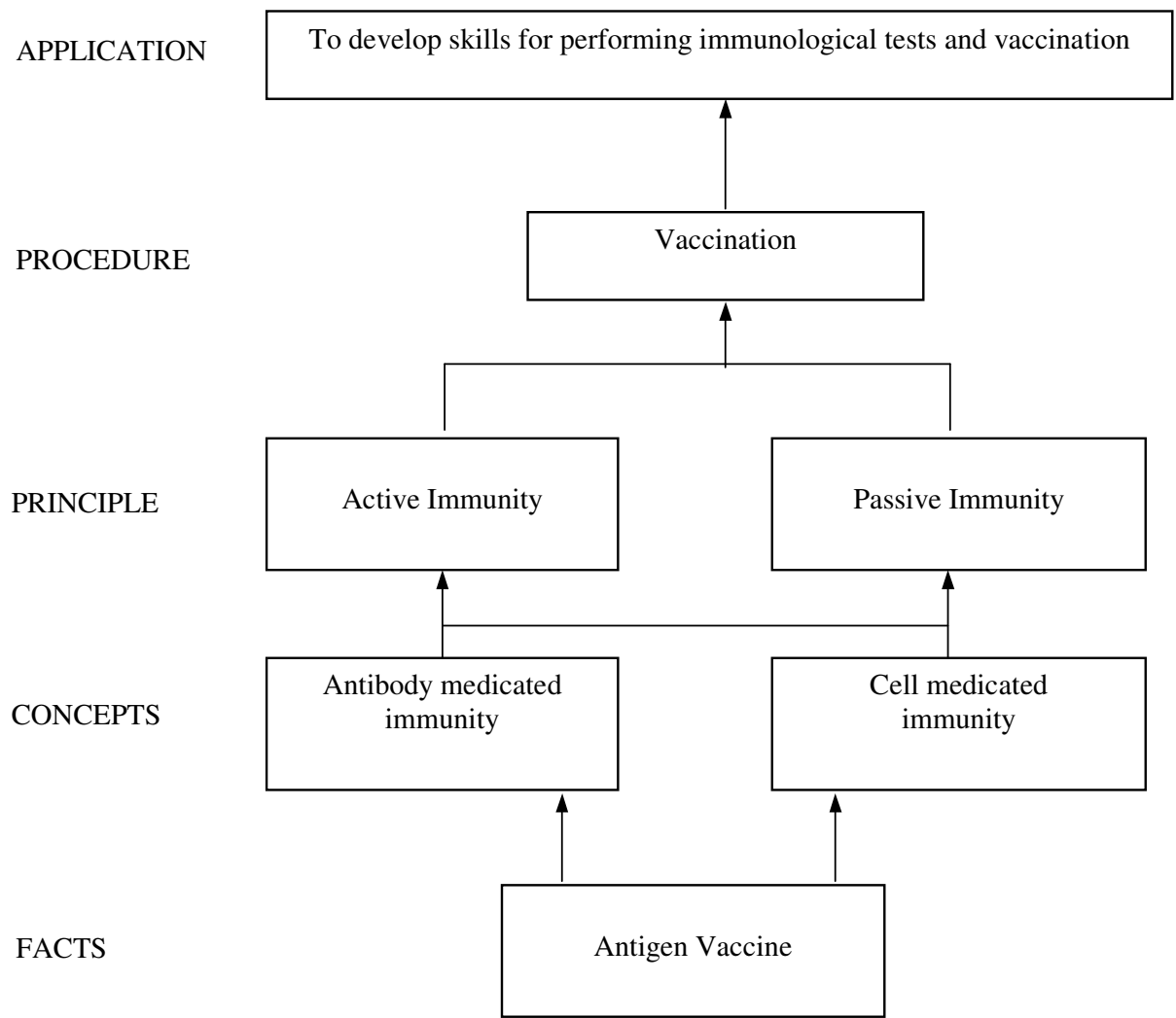
Immunology is a back bone of most of the medical subjects. Understanding of the concepts is required for logical approach and analysis of laboratory investigations.

**OBJECTIVES:**

The student will be able to:

- 1) Understand applications of basic principles in immunology.
- 2) Impart knowledge regarding immunisation schedule and methods of immunisation.

**Learning Structure:**



**CONTENT: Theory**

<b>Chapter</b>	<b>Name of the topic</b>	<b>Marks</b>	<b>Hours</b>
<b>1</b>	<b>ESSENTIALS OF IMMUNOLOGY</b> 1.1 Immunity - Definition, types, factors influencing the level of innate immunity, Mechanisms of innate immunity, Acquired immunity, Measurement of immunity, Local immunity, Hard immunity. 1.2 Immune system - Introduction, central lymphoid organs, cells of immune system. 1.3 Immune response - Definition, Hormonal Immune response, Cellular Immune system.	<b>16</b>	<b>08</b>
<b>2</b>	<b>HYPERSENSITIVITY</b> Definition, classification of Hypersensitivity reactions.	<b>16</b>	<b>08</b>
<b>3</b>	<b>Autoimmunity</b> Definition, Mechanism of autoimmunisation classification of autoimmune diseases.	<b>12</b>	<b>04</b>
<b>4</b>	<b>Immunology of Transplantation</b> Definition, classification of transplant allograft reaction, Mechanism of allograft rejection Histocompatibility antigens, graft versus host reaction.	<b>16</b>	<b>08</b>
<b>5</b>	<b>Vaccination</b> 5.1 Vaccine - Definition of vaccine, types of vaccines, Antisera and antitoxins cold chain, Hazards of immunisation 5.2 Immunisation - Universal programme of immunisation followed in India. 5.3 Vaccines - Type, age, route of administration, reaction, immunity and contraindications of the following vaccines. 1) Measles Vaccine 2) DPT Vaccine 3) BCG Vaccine 4) Polio vaccine 5) Hepatitis A and B vaccine. 6) Typhoid vaccine. 7) Cholera vaccine 8) Antirabies vaccine.	<b>20</b>	<b>20</b>
<b>Total</b>		<b>80</b>	<b>48</b>

**Practical:**

Study of the following vaccines

- a) Measles
- b) DPT
- c) BCG
- d) OPV
- e) Hepatitis B
- f) Typhoid Vaccine
- g) Antirabies Vaccine
- h) Tetanus Toxoid
- i) Hepatitis A Vaccine

**Learning Resources:****Books:**

<b>Sr. No.</b>	<b>Title</b>	<b>Name of Author</b>	<b>Name of Publisher</b>
01	Text book of microbiology	R. Ananth Narayan	Orient Longman Hyderabad
02	Text book of Preventive and social medicine	K. Park	M/S Banarasidas Banot Jabalpur
03	Essential immunology	Ivan M Raitt	Oxford Blackwell scientific publication

**COURSE NAME : DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY**

**COURSE CODE : ML**

**SEMESTER : SIXTH**

**SUBJECT TITLE : PROFESSIONAL PRACTICES-III**

**SUBJECT CODE : --**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
-	-	03	-	-	-	-	-	50@	50

**NOTE:** Two months Hospital/laboratory training is compulsory for all the students of sixth semester after completion of annual theory exam. Final diploma will be awarded only after the completion of eight week Hospital training.

**RATIONALE:**

Most of the diploma holders join pathology laboratory/Hospitals. Due to globalization and competition in the pathology laboratory /Hospital and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence, ability to communicate and to develop learning to learn skills.

Visits to pathology laboratories/Hospitals, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process. Students will be benefited by their exposure to various pathological and clinical activities conducted in laboratories and this experience will add values in their attitude such as value for health, work commitment. hard working, problem solving, punctuality, loyalty and independent study.

**OBJECTIVES:**

The student will be able to :

- 1) Acquire information from different sources.
- 2) Prepare notes for given topic.

- 3) Present given topic in a seminar
- 4) Interact with peers to share thoughts.
- 5) Prepare a report on pathology laboratory/Hospital visit, expert lectures.

**CONTENTS:**

Sr. No.	Activity	HOURS
<b>1</b>	<p><b>INDUSTRIAL VISITS - VISITS TO PATHOLOGY LAB</b>            Structured visits to pathology laboratory should be arranged and report of the same should be submitted by the individual student, to form part of the term work. Visits to any one of the following</p> <ol style="list-style-type: none"> <li>i) Blood bank</li> <li>ii) Hi-tech pathology laboratory</li> <li>iii) Hospitals (different laboratories)</li> </ol>	<b>12</b>
<b>2</b>	<p><b>LECTURES OF FIELD EXPERTS</b>            To be organised on any three topics of the following suggested areas or any other suitable topics.</p> <ol style="list-style-type: none"> <li>1) Biowaste management</li> <li>2) Blood banking</li> <li>3) Recent advances and use of blood components.</li> <li>4) Automation in Haematology</li> <li>5) Interview technique</li> <li>6) Career options in Medical laboratory technology</li> <li>7) Microbial biotechnology.</li> </ol>	<b>12</b>
<b>3</b>	<p><b>GROUP DISCUSSION</b>            Students should discuss in group of six to eight students and write a brief Report on the search/collected information through literature survey, visits and discussion with experts/concerned persons. student should write a brief report on the same and submit it as a part of term work.</p> <ol style="list-style-type: none"> <li>1) Automation in pathology laboratory.</li> <li>2) Yoga and Health awareness.</li> <li>3) Topics of students interest with the consent of teacher.</li> </ol>	<b>12</b>
<b>4</b>	<p><b>SEMINAR</b>            Seminar topics should be related to the subjects of sixth semester each student shall submit a report of atleast ten pages and deliver a seminar for ten minutes.</p>	<b>12</b>
<b>Total</b>		<b>48</b>