

<b>DEPARTMENT OF BIOTECHNOLOGY</b>			<b>Certificate Course</b>				
<b>Course Type</b>	<b>Course Code</b>	<b>Course Code Course Title</b>	<b>Credits</b>	<b>Total Contact Hours</b>	<b>CIA</b>	<b>Ext</b>	<b>Total</b>
Certificate Course		Clinical Laboratory Technology	2	30			

**Course Objectives:**

1. To introduce the students to learn about the various clinical practices.
2. To understand the physiological and biochemical process of various human diseases.
3. To analyse the experimental procedures of diseased and normal samples.
4. To interpret the results .prepare the clinical reports.
5. To make the students aware of the ethics and good lab practices.

**Unit-I: Collection and safe handling of biological samples**

**4h**

Blood, urine, stool, throat swab, sputum, pleural and cerebrospinal fluids. Transport and storage - chemical coated containers, freezing conditions. Biosafety - protective lab coat, gloves, disinfectants, disposal of biological wastes - decontamination, incineration.

**Unit-II:Haematology**

**4h**

Blood, serum and plasma – coagulation. Blood collection - methods. Analysis of Blood – WBC (Total and Differential count), RBC, platelets and plasma (Haemoglobin test). Blood Banking: ABO and Rh Typing – Slide test. Blood transfusion – Compatibility testing. Blood culture and sensitivity. Laboratory investigation of bleeding disorders: Determination of bleeding time, whole blood clotting time and coagulation test.

**Unit-III:Biochemical analysis**

**4h**

Blood glucose - Glucose Tolerance Test (GTT), Lipid profile-Total serum cholesterol, High Density Lipoprotein (HDL), Low density lipoprotein (LDL), C - reactive protein, Thyroid Function Test (TFT) - Thyroxine (T4), Triiodothyronine (T3). Cerebrospinal Fluid - appearance - chemistry.

**Unit-IV: Diagnostics microbiology and immunology**

**4h**

Culture of micro-organisms from biological samples – *Mycobacterium tuberculosis*, *Klebsiella pneumoniae*. Microscopic examinations and identification of pathogenic micro-organisms – wet mount, hanging drop, staining, antibiotic sensitivity, colony counting. Serological tests - Widal test, VDRL, Rheumatoid factor, A.S.O. titre

**Unit-V:Stool & Urine examination**

**4h**

Color - microscopic examination, Semen analysis - physical properties-Microscopic examination – motility, count. Urine examination - physical and chemical properties of urine – microscopic of urine deposits – cast crystals, cells.

**Practicals****10h**

1. Collection of blood sample, separation of serum and plasma
2. Total and Differential count
3. Erythrocyte Sedimentation Rate (ESR)
4. Estimation of blood glucose
5. Oral glucose tolerance test
6. Estimation of serum cholesterol
7. Isolation of microbes from throat (using swab)
8. Enumeration of bacteria using colony counter
9. Physical and chemical analysis of urine
10. WIDAL test

**Books for Study**

1. Sood, R, 1999, Medical Laboratory Technology – methods and interpretations, Fifth edition, Jaypee, New Delhi.
2. Mukherjee, L.K. 1988, Medical Laboratory Technology, Hill Publishing Ltd., New Delhi.
3. Connie R. Mahon. Diane G. Tice. 2006. Clinical Laboratory Immunology. 8th edition. Pearson Prentice Hall. 325 pp.

**Pedagogy**

The teaching methods may include:

1. Problem solving, Demonstrations, hands on experiments and Problem solving

**Course Learning Outcomes:**

On the successful completion of the course, students will be able to

CLO-1	Analyse different parameters involved in normal health & diseased Condition
CLO-2	Correlate different methods of analyzing body fluids
CLO-3	Describe the various biochemical test
CLO-4	Interpert the normal with the diseased sample analysis.
CLO-5	Apply the theoretical studies with experimental analysis.

**Mapping of Course outcomes with Program specific Outcomes:**

CLO/PSO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7
CLO-1	3	3	3	3	3	3	3
CLO-2	3	1	2	1	3	3	2
CLO-3	3	3	1	3	3	2	2
CLO-4	3	3	2	2	3	3	3
CLO-5	3	3	2	3	3	2	2

Advance application-3; Intermediate level-2; Basic level-1

**Course content designed by Dr. S. Baskaran**