



# SACRED HEART COLLEGE (AUTONOMOUS)

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Ready for  
Every Good Work

A Don Bosco Institution of Higher Education, Founded in 1951 \* Affiliated to Thiruvalluvar University, Vellore \* Autonomous since 1987

Accredited by NAAC (4<sup>th</sup> Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

Sacred Heart College (Autonomous), Tirupattur District  
1.2.1 List of New Courses

## PGDMLT

(PG Diploma in Medical Laboratory Technology)

Sem	Sub Code	Paper	Title of the Paper	Ins. Hrs/ Week	Cr	Exam Hrs	Max. Marks		
							CA	Sem	Tot
I SEMESTER	BCD109	Core Paper I	General Laboratory and Instruments Maintenance	5	4	3	50	50	100
	BCD110	Core Paper II	Haematology & Blood Banking	5	4	3	50	50	100
	BCD111	Core Paper III	Microbiology	5	4	3	50	50	100
	BCD112	Core Paper IV	Clinical Biochemistry	5	4	3	50	50	100
	PBCD105	Core Practical I	Lab Course I - Haematology & Microbiology	5	4	6	50	50	100
	PBCD106	Core Practical II	Lab Course II - Diagnostic Biochemistry	5	4	6	50	50	100
				30	24				600
II SEMESTER	BCD209	Core Paper V	Advanced Molecular Laboratory Technology	5	4	3	50	50	100
	BCD210	Core Paper VI	Human Pathogens & Body Fluid Analysis	5	4	3	50	50	100
	PBCD205	Core Practical III	Lab Course III - Urine Analysis and Stool examination	5	4	6	50	50	100
	PBCD206J	Core Paper VII	Internship	13	8	-	50	50	100
	VE804		Human Rights	2	1	-	100	-	100
				30	21				500
				60	45				1100



**Sacred Heart College (Autonomous), Tirupattur District**  
**1.2.1 List of New Courses**

**Department: PGDMLT**

S.No	Course Code	Course Name
1.	BCD109	General Laboratory and Instruments Maintenance
2.	BCD110	Haematology & Blood Banking
3.	BCD111	Microbiology
4.	BCD112	Clinical Biochemistry
5.	PBCD105	Lab Course I - Haematology & Microbiology
6.	PBCD106	Lab Course II - Diagnostic Biochemistry
7.	BCD209	Advanced Molecular Laboratory Technology
8.	BCD210	Human Pathogens & Body Fluid Analysis
9.	PBCD205	Lab Course III - Urine Analysis and Stool examination
10.	PBCD206J	Internship

**SYLLABUS**

Semester	Course Code	Title of the Course	Hours/week	Credits
II	BCD209	Advanced Molecular Laboratory Techniques	5	4

**Course Objectives:**

- ❖ To learn the fundamentals of nucleic acid blotting techniques.
- ❖ To explore the Polymerase Chain Reaction.
- ❖ To understand the basic concepts of DNA sequencing.
- ❖ To give basic ideas about how Hybridization are useful in research investigation.
- ❖ To get familiar with the Radio isotopic techniques.

**Course Outcomes:**

<b>S.No.</b>	<b>Description</b>	<b>Cognitive Level (K-level)</b>
<b>CO-1</b>	Define and understand the nucleic acid blotting techniques, its principle, instrumentation and its types.	<b>K1, K2</b>
<b>CO-2</b>	Determine the knowledge of polymerase chain reaction and its applications	<b>K3</b>
<b>CO-3</b>	Discuss the importance of DNA sequencing in diagnostics and its significance.	<b>K2</b>
<b>CO-4</b>	Assess the DNA finger printing and genome analysis.	<b>K5</b>
<b>CO-5</b>	Correlate the characteristics of Hybridization, immunohistochemistry HLA DNA polymorphism, and parentage testing.	<b>K4</b>
<b>CO-6</b>	Originate the principle, instrumentation and applications of the radio isotopic techniques.	<b>K6</b>

**Unit - I:** Nucleic acid Blotting Techniques – Principle, instrumentation, types – southern,northern,Dot, western blotting, colony and plaque blotting and its applications

**Unit - II:** PCR [Polymerase Chain Reaction]- source, Principle, instrumentation, applications and its types.

**Unit - III:** DNA sequencing –Maxam and Gilbert technique, Dideoxy nucleotide method, DNA sequencing by primer walking, Chromosome walking, chromosomal jumping, RFLP and chromosomal aberrations, DNA finger printing and genome analysis.

**Unit - IV:** Hybridization - Tissue *in situ* hybridization; relationship of *in situ* hybridization to other molecular methods of immunohistochemistry, technical consideration and methodology; HLA DNA polymorphism, and parentage testing.

**Unit - V:** Radio isotopic techniques – Principle, instrumentation and applications of Dilution studies, dynamic function test, organ scanning auto radiography and radio immuno assay

### Reference Books

1. Sathyanarayana.U. Biotechnology
2. Henry, John Bernard, Todd Sanford and Davidson, 2002. Clinical diagnosis and management by laboratory methods. W.B. Saunders& Co
3. Fischbach Francis A, 2003. Manual of laboratory and diagnostic tests. Philadelphia,J.B. Lippincott& Co, N.Y.
4. Gradwohls, 2000. Clinical laboratory methods and diagnosis ed.Alex.C. Sonnenwirth& Leonard Jarret.M.D.B.I.Publications, New Delhi,
5. Sood, R, 2005, Medical Laboratory methods and interpretation, Jaypee brothers medical publications, New Delhi.

Semester	Course Code	Title of the Course	Hours/Week	Credits
VI	BCD210	Human Pathogens & Body Fluid Analysis	5	4

### Course Objectives:

- To acquire broad knowledge on human pathogens, its symptoms, causes and treatment.

- To understand the fundamentals concepts in bacteriology, virology and mycology.
- To know the basics of source and mode of action of Viruses and fungi infecting the humans.
- To comprehend the formation, collection and functions of Amniotic and Cerebrospinal fluids.
- To exhibit skills on the formation, collection and functions of Serous fluid and other body fluids.

**Course Outcomes:**

S.No.	Description	Cognitive Level (K-Level)
CO-1	Identify the fundamentals concepts in human pathogens, its symptoms, causes and treatment.	K1
CO-2	Demonstrate broad knowledge on the fundamentals concepts in bacteriology and virology.	K2
CO-3	Distinguish the fundamentals concepts in mycology and its pathogenesis in humans.	K2
CO-4	Determine to know the fundamentals of source and mode of action of Human Viruses and fungi.	K3
CO-5	Correlate and measure the formation, collection and functions of Amniotic and Cerebrospinal fluids.	K4, K5
CO-6	Originate on the formation, collection and functions of Serous fluid and other body fluids.	K6

**Unit-I:** Bacteriology: Symptoms, causes and treatment of pathogenic and non-pathogenic bacterias. Pathogenic Bacteria-TB, Salmonella typhi, vibrio cholera, Clostridium tetani coli, bifidobacteria, -Non-Pathogenic Bacteria- staphylococcus, lactobacillus, Escherichia bacteroides and *Brevibacterium linens*.

**Unit-II:** Virology: Classification, Source and mode of action of Human Viruses – HIV, HSV, Swine flu (H1 N1), chicken guinea, Rota virus, Ebola virus, SAARS, Dengue, Corona, Adenovo virus, Hepatitis and Bacteriophage.

**Unit-III:** Mycology: Dimorphic fungi causing systemic Mycoses, Diamataceous Fungi, agents of Zygomycosis, Fungi causing Eumycoticmycetoma.

**Unit-IV: Amniotic & Cerebrospinal fluid**

Amniotic Fluid: Formation and function of amniotic fluid, Chemical composition, Collection, Testing – Alpha fetoprotein, Acetyl cholinesterase, Neural tube defects, Chromosomal abnormalities, Haemolytic disease of new born, Gestation age, Fetal maturation. Cerebrospinal fluid: Formation, Specimen collection, Chemical analysis, Microbiologic examination, Immunologic tests, Cytological examination and clinical correlation.

**Unit-V: Serous fluid & other body fluids**

Formation, Collection, Classes of effusions, Cell types and clinical correlations. Lymph, Gastric fluid, Urine, Faeces, Seminal fluid, Sputum and sweat, Biomarker evaluation in body fluids for specific therapeutic prognostic and /or diagnostic potential.

### Reference Books

1. Richard, D.G., C.B., Slack, J.F. Penthere, 1996. Medical Microbiology. Churchill Livingstone, USA.
2. Chatterjee, 1986, Medical Parasitology, Tata McGraw Hill, India.
3. Pelczar,M.J., E.C.S. Chan., Krieg, N.R, 1996. Microbiology, Tata McGraw Hill, India.
4. Tortora, G.S., Grabowski, S.R., Principles of Anatomy & Physiology,1996,8<sup>th</sup> edition,
5. Harper Collins, NY.
6. Guyton & Hall., Textbook of Medical Physiology,2000,10th edition, Elseiner, New Delhi.
7. JuneH.Cella, JuanitaWatson, Manual of Laboratory Tests, 2004, Aitbs Publishers, New Delhi
8. Elkinton&Danowski, The Body Fluids, 2002,Williams &Wilkins, Baltimore

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### Lab Course – III

#### Urine Analysis and Stool Examination

#### Practical - III

**5 Hrs / week  
4 Credits**

#### I.Urine Analysis

#### i. Collection and physical examination:

Collection of urine, Types of preservative, physical examination; Volume, colour, odour, appearance, specific gravity and pH.

## **ii. Chemical examination**

Reducing sugar-Benedict test, protein:- Heat and acetic acid test, and sulfosalicylic acid method, Ketone bodies-Roth's test, Bile pigment (Fouchet method), bile salt (Hay's test), Urobilinogen-Ehrlich aldehyde test and Bence Jones protein test, Renal clearance test-urea, creatine, Test for mucin.

## **iii. Microscopical Examination**

Microscopic examination; Identification of casts and crystals and blood cells-RBC, WBC, SE epithelial cells, smear for gram staining and urine culture.

## **II. Stool Analysis**

### **i. Collection and physical examination:**

Collection of fecal specimen, preservation, physical examination; volume, colour, odour and appearance.

### **ii. Chemical examination:**

reducing sugar, occult blood test Demonstration of fat in stool, detection of steatorrhea.

### **iii. Microscopic Examination**

Concentration method, direct centrifuge floatation method and ether extraction method for ova and cysts. Identification of crystals, meat fibers, fat globules and blood cells. Culture especially for enriched group of organisms.

## **III. Salivary Analysis: Salivary Cortisol**

## **IV. Tears Analysis**

## **V. Other Body fluid Analysis**

Seminal fluid, Amniotic fluid and CSF

## **Reference Books**

1. Sabitrisanyal-(1991): Text book of pathology, first edition,
2. June H.cella- (1994): Manual of laboratory test, AITBS publishers.