

CBSE | DEPARTMENT OF SKILL EDUCATION CURRICULUM FOR SESSION 2023-2024

MEDICAL DIAGNOSTICS (SUBJECT CODE 828)

JOB ROLE: Medical Lab Technician

CLASS-XII FOR SESSION 2023-24

Total Marks: 100 (Theory-60 + Practical-40)

COURSE OVERVIEW:

The course is designed to facilitate learning the essentials of Medical Diagnostics. Design of the course shall aid in developing skills required in planning and executing Laboratory process. Laboratory techniques along with fundamentals of laboratory management shall direct the learning process and will ensure efficient and effective understanding and performance in all spheres of laboratory works.

OBJECTIVES OF THE COURSE:

In this course, the students will be introduced to the fundamental concepts of medical technology and the career opportunities available in this field. This course provides an insight to the students regarding various issues associated with laboratory works like Investigation of Bio-fluids, Analysis of blood smear, and Works in blood bank etc. and building up goodwill and reputation of Laboratory or Hospitals with the essential concepts of Medical diagnostics. Class participation would be fundamental for the development of transferrable skills.

Followings are the main objectives of this course.

- To familiarize the students regarding various dimensions of Medical lab technology and career opportunities available in these fields.
- To develop practical understanding among the students associated with Medical lab through classroom discussion/ participation and projects.
- To develop transferrable skills among the students for managing Laboratory works efficiently so that they could be ready to join the Laboratory functions in any organization.
- To provide knowledge to students in concise and understandable format so that students could learn and apply these concepts in their career for the growth.
- To provide brief insight about personal grooming and its stages, meaning and importance of knowledge of Laboratory base works and other key dimensions of laboratory management in Hospitals.

SALIENT FEATURES:

- Medical diagnostics is originally an important part of promotion in Lab technology.
- Medical diagnostics has existed for ages and is time format of Lab works.
- Medical diagnostics provides an opportunity to the technicians to become well equipped in their area.
- It involves departmental interaction with the patients and attendants to ensure a quality service.
- It ensures identification of diseases facilitates treatment procedures and ensures recovery by maintaining good relations between Health care professionals and patients.
- Medical diagnostics bridges the knowledge gap between the Health care professionals and Patients and makes information available to the Patients and enhances their understanding about the disease and treatment procedures.

LIST OF EQUIPMENT AND MATERIALS:

The list given below is suggestive and an exhaustive list should be prepared by the skill teacher. Only basic tools, equipment and accessories should be procured by the Institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

Material Required for MEDICAL DIAGNOSTICS

Laboratory should contain the following: -

- Leishman's Stain
- Slide and coverslip
- Rubbing alcohol
- Lancet
- Cotton wool
- Piece of cotton clothe
- Staining rack
- Blood Grouping Reagents
- Centrifuge
- Artificial urine prepared by teacher (with the help of chemical salts according to composition of urine)
- Glacial acetic acid
- Sodium nitroprusside
- Liquor ammonia
- Benedict's reagent
- Sulphur powder

- Benzidine powder
- Hematoxylin and Eosin stain
- Pipette
- Burning mixture
- Lamp
- Test tubes
- Test tube holders
- Apron for students
- Histopathological slides

CAREER OPPORTUNITIES:

Medical diagnostics as a functional domain offers immense career opportunities to all age group of people irrespective of qualification, gender, race and religion. Following career opportunities are available in this field. Students can make their career in any field based on their interest and suitability in

- Forensic Science
- Medical lab technology
- Pathology
- Biotechnology
- Cytology
- Pharmacy

VERTICAL MOBILITY:

At Bachelor level, students may start their career as an assistant lab technician and they can reach at managerial level over the period of time. For the career progression, following career options are available in Medical diagnostics field.

- Assistant Medical lab technicians
- Blood Collectors for Lab purpose
- Lab receptionist
- Medical representative
- Medical transcriptionist

CURRICULUM:

This course is a planned sequence of instructions consisting of Units meant for developing employability and Skills competencies of students of Class XI and XII opting for Skills subject along with other subjects.

MEDICAL DIAGNOSTICS (SUBJECT CODE 828)**CLASS–XII FOR SESSION 2023-24****Total Marks: 100 (Theory-60 + Practical-40)**

	UNITS	NO. OF HOURS for Theory and Practical	MAX. MARKS for Theory and Practical
Part A	Employability Skills		
	Unit 1 : Communication Skills - IV	13	2
	Unit 2 : Self-Management Skills - IV	07	2
	Unit 3 : ICT Skills - IV	13	2
	Unit 4 : Entrepreneurial Skills - IV	10	2
	Unit 5 : Green Skills - IV	07	2
	Total	50	10
Part B	Subject Specific Skills		
	Unit 1 : Hematology	40	20
	Unit 2 : Blood bank	40	20
	Unit 3 : Cytology	40	10
	Total	120	50
Part C	Practical		
	Project	50	10
	Viva based on Project		10
	Practical File/ Report / Portfolio / Power Point presentation		10
	Demonstration of skill competency via Lab Activities		10
	Total		50
	GRAND TOTAL	220	100

DETAILED CURRICULUM/TOPICS:

Part-A: EMPLOYABILITY SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1 : Communication Skills - IV	13
2.	Unit 2 : Self-management Skills - IV	07
3.	Unit 3 : Information and Communication Technology Skills - IV	13
4.	Unit 4 : Entrepreneurial Skills - IV	10
5.	Unit 5 : Green Skills - IV	07
	TOTAL DURATION	50

NOTE: For Detailed Curriculum/ Topics to be covered under Part A: Employability Skills can be downloaded from CBSE website.

Part-B – SUBJECT SPECIFIC SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1 : Haematology	40
2.	Unit 2 : Blood bank	40
3.	Unit 3 : Cytology	40
	TOTAL DURATION	120

UNIT	SUB-UNIT	SESSION/ ACTIVITY/ PRACTICAL
1. HEMATOLOGYLAB	1.1 Introduction	Session: Idea about Haematology laboratory
	1.2 Haematology lab instruments	Session: Understanding about <ul style="list-style-type: none"> • Centrifuge • Microscope • Automated Cell Counter • Coagulation Analyser
	1.3 Collection of blood sample	Session: Understanding about <ul style="list-style-type: none"> • Anticoagulants • Specimen collection
		Activity: Collection of blood by venepuncture method
	1.4 Preparation of blood smear	Practical: <ul style="list-style-type: none"> • Preparations of Blood smear
	1.5 Reagents- preparation and their uses	Session: Understanding about <ul style="list-style-type: none"> • Different kinds of stains and reagents that are used in laboratory. • Diluting fluids for cell counting process.
	1.6 Staining methods	Practical: <ul style="list-style-type: none"> • Staining of Blood Smear by using Leishman's stain
	1.7 Measurements and Quantitative analysis	Session: Understanding about <ul style="list-style-type: none"> • PCV and Erythrocyte Indices • ESR • LE cell • Osmotic fragility
<ul style="list-style-type: none"> • Activity – • Blood cell counting(R.B.C, W.B.C, Platelets Reticulocytes and Absolute Eosinophil) • Haemoglobin estimation Performing the following experiments in laboratory <ul style="list-style-type: none"> • Overview of Haemocytometer • Osmotic Fragility test • Blood counting by Neuberg's Chamber(Demonstration) • Identification of different blood cells under microscope. • Estimation of the haemoglobin concentration 		

UNIT	SUB-UNIT	SESSION/ ACTIVITY/ PRACTICAL
	1.8 Anaemia	Session: Understanding the concepts of: <ul style="list-style-type: none"> • Hemopoiesis • Classification of Anaemia
	1.9 Hemopoiesis	Session: Mechanisms of Process Different tests involved in this process
	1.10 Bone marrow aspiration/Biopsy	Session: Understanding about the concepts of <ul style="list-style-type: none"> • Site for aspiration Procedure • Procedure
	1.11 Lab Safety	Activity: <ul style="list-style-type: none"> • Preparation of project by students in following topic: • Biomedical waste management* • Personnel Protection • Hand Hygiene • Management of spills
2. BLOOD BANK AND TRANSFUSION	2.1 Material and Equipment	Session: Understanding about the concepts of materials and equipment needed for Blood bank
		Activity: Preparation of charts based on the materials and equipment needed for blood bank
	2.2 Records in Blood Bank	Session: Understanding about different kinds of records that are kept in blood bank.
	2.3 ABO blood group system	Session: Understanding the concepts of ABO blood grouping.
	2.4 Practical importance of other blood groups	Practical: Determination of Blood group in given sample. Session: Understanding the concepts of different blood group system other than ABO grouping system.

UNIT	SUB-UNIT	SESSION/ ACTIVITY/ PRACTICAL
3. CYTOPATH - OLOGY	3.1 Introduction	Session: <ul style="list-style-type: none"> • Definition of cytopathology • Materials and equipment
	3.2 Exfoliated cytology	Session: Understanding the concept of common sites for exfoliate cytology.
	3.3 FNAC	Session: Understanding the following concepts of FNAC <ul style="list-style-type: none"> • Equipment • Technique • Preparation of smear Preparation of cell blocks Activity: The students will prepare chart or flash card of technique of FNAC.
	3.4 Cytological Fixatives	Session: Understanding the following concepts of <ul style="list-style-type: none"> • Properties • Classification
	3.5 Cytopsin	Session: Understanding the concepts of using cytopsin for CSF.
	3.6 Staining procedures in cytology	Activity: <ul style="list-style-type: none"> • Description about PAP staining and Haematoxylin and Eosin stain in their file
	3.7 Maintenance of stains and solutions and general precautions	Session: Understanding the concepts of maintenance of stains and solutions and general precautions
	3.8 Storage and archiving of specimens	Session: Understanding the general guidelines for storage and archival in a pathology laboratory.
	3.9 Safety in laboratory	Session: Understanding the concepts of safety in laboratory and self-assessment.