SEC Course Proposed by Department of Biochemistry and Daulat Ram College
Track : Laboratory Techniques Series

SEC Course: MEDICAL DIAGNOSTICS

1. CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Coursetitle &Code	Credits	Credit distribution of the course			Eligibility criteria	Pre- requisite ofthe course
		Lecture	Tutorial	Practical		
Medical Diagnostics	2	0	0	2	XII pass	None

2. Learning Objectives

This course aims to train the students in skills required in biochemical, hematological and immune- diagnostics through the use of various procedures, methods and equipment for the purpose of disease diagnosis. The students are skill trained to develop the knowledge, technical and critical thinking skills essential to safely and reliable collection and analysis of patient samples. The will be skill trained to work in diagnostics labs in hospitals, research/ pathology/ Laboratories and Pharma industry.

3. Learning Outcomes

After the completion of the course the students will be able to

- Process and store bio-samples following Biosafety practices.
- Perform various Biochemistry assays.
- Perform Haematological analysis & diagnosis of diseases.
- Perform Immunodiagnostic assays.
- Record data and analyse report.

4. Main Course Structure

Unit 1 – Laboratory safety and standards **4 Hours**

- Biosafety Practices, Sample collection, processing, labelling, preservation and record keeping.
- Bio-waste disposal techniques

Unit 2– Hematological Investigations **16 hours**

- RBC count, Erythrocyte sedimentation rate, packed cell volume
- Total Leukocyte count, Differential Leukocyte count, Absolute Eosinophil count
- Hemorrhagic disorders: Clotting time
- Blood group determination

Unit 3– Biochemical Investigations **28 hours**

Biochemical markers for disease. Serum, sputum and urine analysis.

- Assays of salivary markers of acute myocardial infarction: CK-MB/ cTn (cardiac markers)
- Diabetes markers
- Estimation of Serum electrolytes: Na, K, Ca, P
- Estimation of Serum bilirubin, direct and indirect, Serum Transaminases : SGPT/SGOT (Liver Function Test)
- Serum Hormone assays: Thyroid, TSH (ELISA) (endocrine Function)
- Analysis of Urine for abnormal constituents: Proteins, sugar, ketones

Unit 4 –Immuno Diagnostics **8 Hours**

- Rapid Antigen assay.
- RT-PCR test

Unit 5-- Visit to a Diagnostic lab **4 Hours**

Automation and real lab scenario experience

5. Teaching Methodology/Activities in the classroom

Introduction to basic concepts and the principles of the practicals to be performed with power point presentations. Students made aware of safety protocols and which nave to be strictly followed. Hands on training of the advance instruments to be used and the lab practicals to be performed

6. Assessment Pattern for each Unit/practical.

Unit 1: 10 marks

Student will be assessed by viva- voce, quiz, written assessment and on participation in various activities and practicals in class on the following topics:

1. Biosafety measures.
2. Collection and storage of samples.
3. Bio waste disposal techniques

Unit 2: 20 marks

Students will be assessed on the Knowledge of the concepts and the protocols of Haematological investigations by viva- voce, quiz, written assessment and on participation in various activities and practicals on the following topics:

1. RBC and differential counting
2. Blood group typing

Unit 3: 25 marks

Students will be assessed on the knowledge of the concepts and the protocols of Biochemical investigations by viva- voce, quiz, written assessment and on participation in various activities and practicals on the following topics:

1. Disease diagnosis of myocardial infarction and Diabetes
2. Liver function test and its importance in disease diagnosis.
3. Hormone assays
4. Importance of urine analysis in disease diagnosis

Unit 4: 15 marks

Students will be assessed on the knowledge of the concepts and the protocols of Immuno-Diagnostics by viva- voce, quiz, written assessment and on participation in various activities and practicals on the following topics:

1. Disease diagnosis by Rapid Antigen test
2. Disease diagnosis by RT-PCR test

Unit 5: 10 marks

Students will be assessed on the basis of field report prepared on the Diagnostic Lab visit.

7. Mapping With next suggestive course

Mapping done with SEC: Advance Molecular Diagnostics

8. Job opportunities

The Medical Diagnostics skill program prepares students to become integral members of the health care system. Students trained in lab skills will be employable in research labs, R & D labs in Pharma andBiotechnology industry and Diagnostic labs.

9. Essential / Suggested readings:

- Sood R. (2015) Concise book of Medical Laboratory technology: Methods and interpretation. 2nd edition. The health Science Publisher 2015
- Sant M. (2020) Textbook of Medical Laboratory Technology. CBS 2020