

## DESH BHAGAT UNIVERSITY, MANDI GOBINDGARH

### FACULTY OF ALLIED HEALTH SCIENCES

#### Master of Medical Microbiology

##### Programme Outcomes:

**PO1.Laboratory knowledge:** Apply the knowledge of human anatomy, physiology, hematology, pathology, microbiology and biochemistry related to medical laboratory.

**PO2.Problem analysis:** Identify, and analyze problems to arrive at substantiated conclusions using knowledge about different medical laboratory procedures.

**PO3.Design/development of solutions:** Design solutions for complex diagnosis problems and design system components, processes to meet the specifications with consideration for the public health and safety, and environmental considerations.

**PO4.Conduct investigations of complex problems:** Use knowledge including protocols, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5.Modern tool usage:** Create select, and apply appropriate techniques, resources, and modern technology and laboratory tools.

**PO6. The lab technician and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal issues and the consequent responsibilities relevant

**PO7.Environment and sustainability:** Understand the impact of the professional lab technician in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities of the medical lab practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10.Communication:** Communicate effectively with the laboratory community and with society (patient) at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11.Management and finance:** Demonstrate knowledge and understanding of protocols and management principles and apply these to one's own work, as a member and leader in a team.

**PO12.Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

##### Course Code: MSMB-101

##### Title of the Course: Human Anatomy & Physiology

L	T	P	Credit
3	-	-	3

##### Course Outcomes:

**CO1:** Describe the general structure and functions of the body as a whole.

**CO2:** Describe the general and microscopic structure and functions of each system of the body.

**CO3:** Explain the macroscopic and microscopic structure and functions of each organs of the body.

##### Course Code: MSMB-102

##### Title of the Course: Human Anatomy & Physiology-Practical

L	T	P	Credit
-	-	2	2

**Course Outcomes:**

**CO1.**Anatomy is a key component of all education programmes for OTTs and should have a strong focus on organ position, orientation and relationships.

**CO2.**The topics provide the student with an understanding of the structure and relationships of the systems and organs of the body which is essential in patient positioning and accurate delivery of intervention.

**CO3.**Similarly Physiology provides the students with knowledge of the function of systems and organs and their relationships and underpins the understanding of how surgical intervention can modify the function and structure of outcomes.

**Course Code: MSMB-103**

**Title of the Course: Clinical Biochemistry**

L	T	P	Credit
3	1	-	4

**Course Outcomes:**

**CO1:** Correlate biochemical findings with those generated in other areas of the clinical laboratory, patient symptoms and clinical history, to make appropriate and effective on-the-job professional decisions.

**CO2:** Perform basic Biochemistry laboratory testing, assess laboratory data and report findings according to laboratory protocol.

**CO3:** Adapt biochemistry laboratory techniques and procedures when errors and discrepancies in results are obtained to effect resolution in a professional and timely manner.

**Course Code: MSMB-104**

**Title of the Course: Clinical Biochemistry-Practical**

L	T	P	Credit
-	-	2	2

**Course Outcomes:**

**CO1:** Correlate biochemical findings with those generated in other areas of the clinical laboratory, patient symptoms and clinical history, to make appropriate and effective on-the-job professional decisions.

**CO2:** Perform basic Biochemistry laboratory testing, assess laboratory data and report findings according to laboratory protocol.

**CO3:** Adapt biochemistry laboratory techniques and procedures when errors and discrepancies in results are obtained to effect resolution in a professional and timely manner.

**Course Code: MSMB-105**

**Title of the Course: Clinical Pathology**

L	T	P	Credit
3	1	-	4

**Course Outcomes:**

**CO1:** Demonstrate an understanding of essential basic pathological processes including cell death and injury, inflammation, thrombosis and neoplasia

**CO2:** Acquire the ability to relate these essential basic pathological processes to the pathogenesis of common and important diseases.

**CO3:** Demonstrate an understanding of the predisposing factors, causes, pathogenesis, morphology and potential complications of such diseases.

**Course Code: MSMB-106**

**Title of the Course: Clinical Pathology-Practical**

L	T	P	Credit
-	-	2	2

**Course Outcomes:**

**CO1:** Demonstrate an understanding of essential basic pathological processes including cell death and injury, inflammation, thrombosis and neoplasia

**CO2:** Acquire the ability to relate these essential basic pathological processes to the pathogenesis of common and important diseases.

**CO3:** Demonstrate an understanding of the predisposing factors, causes, pathogenesis, morphology and potential complications of such diseases.

**Course Code: MSMB-107**

**Title of the Course: Clinical Microbiology**

L	T	P	Credit
3	1	-	4

**Course outcomes:**

**CO1:** Know and understand about microorganisms, their importance and history of microbiology.

**CO2:** Understand and Apply various equipment used microbiology.

**CO3:** Learn basic morphology cultural characteristics of microbes, their growth and their interpretation.

**Course Code: MSMB-108**

**Title of the Course: Clinical Microbiology-Practical**

L	T	P	Credit
-	-	2	2

**Course outcomes:**

**CO1:** Know and understand about microorganisms, their importance and history of microbiology.

**CO2:** Understand and Apply various equipment used microbiology.

**CO3:** Learn basic morphology cultural characteristics of microbes, their growth and their interpretation.

**Course Code: MSMB-201**

**Title of the Course: Physiology and Nutrition**

L	T	P	Credit
3	-	-	3

**Course Outcomes:**

**CO1:** Describe the general structure and functions of the body as a whole.

**CO2:** Describe the general and microscopic structure and functions of each system of the body.

**CO3:** Explain the macroscopic and microscopic structure and functions of each organs of the body.

**Course Code: MSMB-202**

**Title of the Course: Physiology and Nutrition-Practical**

L	T	P	Credit
-	-	2	2

**Course Outcomes:****CO1:** Describe the general structure and functions of the body as a whole.**CO2:** Describe the general and microscopic structure and functions of each system of the body.**CO3:** Explain the macroscopic and microscopic structure and functions of each organs of the body.**Course Code: MSMB-203****Title of the Course: Biostatistics and Hospital Management**

L	T	P	Credit
3	1	-	4

**Course Outcomes:****CO1:** Student will get insight of research tools**CO2:** The student will gain knowledge of basic statistical approaches**CO3:** Enhance knowledge of databases in research**Course Code: MSMB-204****Title of the Course: Biostatistics and Hospital Management-Practical**

L	T	P	Credit
-	-	2	2

**Course Outcomes:****CO1:** Student will get insight of research tools**CO2:** The student will gain knowledge of basic statistical approaches**CO3:** Enhance knowledge of databases in research**Course Code: MMHC-205****Title of the Course: Clinical Hematology**

L	T	P	Credit
3	1	-	4

**Course outcomes:****CO1:** Describe basic theories of homeostasis including: -Interrelationship of the three systems in the haemostatic mechanism. -Blood coagulation factors. -Cascade theory. -Fibrinolytic mechanism. -Regulatory mechanisms.**CO2:** Evaluate given clinical and laboratory data and determine cause of defects in the haemostatic mechanism.**CO3:** Demonstrate proper use of the various coagulation reagents required in the clinical laboratory**Course Code: MMHC-206****Title of the Course: Clinical Hematology-Practical**

L	T	P	Credit
3	1	-	4

**Course outcomes:**

**CO1:** Describe basic theories of homeostasis including: -Interrelationship of the three systems in the haemostatic mechanism. -Blood coagulation factors. -Cascade theory. -Fibrinolytic mechanism. -Regulatory mechanisms.

**CO2:** Evaluate given clinical and laboratory data and determine cause of defects in the haemostatic mechanism.

**CO3:** Demonstrate proper use of the various coagulation reagents required in the clinical laboratory

**Course Code: MSMB-207**

**Title of the Course: Advance Instrumentation & Maintenance**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
<b>3</b>	<b>1</b>	<b>2</b>	<b>5</b>

**Course Outcomes:**

**CO1:** Choose appropriate strategies and instrumentation for analysis of different biological sample types.

**CO2:** Evaluate the applicability, advantages, limitations and sources of error of current analytical instruments through an understanding of the working principles of these instruments and the underlying biochemical basis.

**CO3:** Conduct biochemical analyses and instrument evaluations in the laboratory and link the practical applications to the theoretical background

**Course Code: MSMB-208**

**Title of the Course: Advance Instrumentation & Maintenance-Practical**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
<b>3</b>	<b>1</b>	<b>2</b>	<b>5</b>

**Course Outcomes:**

**CO1:** Choose appropriate strategies and instrumentation for analysis of different biological sample types.

**CO2:** Evaluate the applicability, advantages, limitations and sources of error of current analytical instruments through an understanding of the working principles of these instruments and the underlying biochemical basis.

**CO3:** Conduct biochemical analyses and instrument evaluations in the laboratory and link the practical applications to the theoretical background

**Course Code: MSMB-301**

**Title of the Course: Lab Management**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
<b>3</b>	<b>-</b>	<b>-</b>	<b>3</b>

**Course Outcomes:**

**CO1:** Understand the ethics and code of practice of a medical laboratory technician

**CO2:** Understand the quality management in laboratory

**CO3:** Understand the information system and financial management in a medical facility

**Course Code: MSMB-302**

**Title of the Course: Parasitology and Bacteriology**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**Course Outcomes:**

**CO1:** Understand the ethics and code of practice of a medical laboratory technician

**CO2:** Understand the quality management in laboratory

**CO3:** Understand the information system and financial management in a medical facility

**Course Code: MSMB-303**

**Title of the Course: Parasitology and Bacteriology-Practical**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**Course Outcomes:**

**CO1:** Understand the concepts of parasitological and its components.

**CO2:** Know about various medically important parasites, their pathogenesis and laboratory diagnosis

**Course Code: MSMB-304**

**Title of the Course: Immunology, Virology and Mycology**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
<b>3</b>	<b>1</b>	<b>2</b>	<b>5</b>

**Course Outcomes:**

**CO1:** Understand the concepts of parasitological and its components.

**CO2:** Know about various medically important parasites, their pathogenesis and laboratory diagnosis

**CO3:** Know about various medically important viruses, their pathogenesis and laboratory laboratory diagnosis of some important viral infections.

**Course Code: MSMB-305**

**Title of the Course: Immunology, Virology and Mycology-Practical**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
<b>3</b>	<b>1</b>	<b>2</b>	<b>5</b>

**Course Outcomes:**

**CO1:** Know and understand basic and advanced concepts of immunity and its components

**CO2:** Understand and apply various serological tests used in laboratory

**CO3:** Learn basic morphology and cultural characteristics of fungi, their growth and their laboratory diagnosis

**Course Code: MSMB-306**

**Title of the Course: Seminar**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
<b>3</b>	<b>1</b>	<b>2</b>	<b>5</b>

**Course Outcomes:**

**CO1:** Know and understand basic and advanced concepts of immunity and its components

**CO2:** Understand and apply various serological tests used in laboratory

**CO3:** Learn basic morphology and cultural characteristics of fungi, their growth and their laboratory diagnosis

**Course Code: MSMB-401**

**Title of the Course: Molecular Biology**

L	T	P	Credit
3	1	-	4

**Course Outcomes:**

**CO1:** Gain knowledge and understanding of biochemistry, structure and function of biological molecules.

**CO2:** Explain biological mechanisms, such as the processes and control of bioenergetics and metabolism, as chemical reactions.

**CO3:** To learn the concept and mechanism of ATP synthesis

**Course Code: MSMB-402**

**Title of the Course: Molecular Biology-Practical**

L	T	P	Credit
-	-	2	2

**Course Outcomes:**

**CO1:** Gain knowledge and understanding of biochemistry, structure and function of biological molecules.

**CO2:** Explain biological mechanisms, such as the processes and control of bioenergetics and metabolism, as chemical reactions.

**CO3:** To learn the concept and mechanism of ATP synthesis

**Course Code: MSMB-403**

**Title of the Course: Diagnostic Microbiology**

L	T	P	Credit
3	1	-	4

**Course Outcomes:**

**CO1:** Students will study about the growth of different types of microorganisms based on various environmental factors.

**CO2:** Students will gain knowledge about the nutrient uptake and transport and the different metabolic pathways involved in their growth.

**CO3:** Students will also learn about viruses and eukaryotic cell structure in detail.

**Course Code: MSMB-404**

**Title of the Course: Diagnostic Microbiology-Practical**

L	T	P	Credit
3	1	-	4

**Course Outcomes:**

**CO1:** Students will study about the growth of different types of microorganisms based on various environmental factors.

**CO2:** Students will gain knowledge about the nutrient uptake and transport and the different metabolic pathways involved in their growth.

**CO3:** Students will also learn about viruses and eukaryotic cell structure in detail.

**Course Code: MMIC-405**

**Title of the Course: Dissertation**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**Course Outcomes:**

**CO1:** Gain knowledge and understanding of biochemistry, structure and function of biological molecules.

**CO2:** Explain biological mechanisms, such as the processes and control of bioenergetics and metabolism, as chemical reactions.

**CO3:** To learn the concept and mechanism of ATP synthesis