

Program and Course Structure

School of Medical Science and Research

MSc (Medical Microbiology)

Session:2021-24

Program Code:SMS0502

1. Standard Structure of the Program at University Level

1.1 Vision, Mission and Core Values of the University

Vision of the University

To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.

Mission of the University

1. Transformative educational experience
2. Enrichment by educational initiatives that encourage global outlook
3. Develop research, support disruptive innovations and accelerate entrepreneurship
4. Seeking beyond boundaries

Core Values

- Integrity
- Leadership
- Diversity
- Community

1.2 Vision and Mission of the School

Vision of the School

To serve the society by being a premier institute that promotes a comprehensive approach to human health through excellence in academics, research and clinical care

Mission of the School

- Provide a transformative educational experience in Medical Science
- Develop skills and competencies to create global leaders in clinical care
- Promote innovative and collaborative research through intellectual and technological advancement
- Establish a center for excellence in preventive, promotive and curative health care

Core Values

- Integrity
- Leadership
- Ethics
- Community Health

1.3 Programme Educational Objectives (PEO)

1.3.1 Writing Programme Educational Objectives (PEO)

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

A post graduate student having qualified the MD (Medicine) examination should be able to:

- PEO1. Practice efficiently internal medicine specialty, backed by scientific knowledge including basic sciences and skills.
- PEO2. Diagnose and manage majority of conditions in his specialty (clinically and with the help of relevant investigations).
- PEO 3. Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards.
- PEO 4. Plan and deliver comprehensive treatment using the principles of rational drug therapy.
- PEO 5. Plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty.
- PEO 6. Manage emergencies efficiently by providing Basic Life Support (BLS) and Advanced Life Support (ALS) in emergency situations.
- PEO 7. Recognize conditions that may be outside the area of the specialty/competence and refer them to an appropriate specialist.
- PEO 8. Demonstrate skills in documentation of case details including epidemiological data.
- PEO 9. Play the assigned role in the implementation of National Health Programs.
- PEO 10. Demonstrate competence in basic concepts of research methodology and clinical epidemiology; and preventive aspects of various disease states.
- PEO 11. Be a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner.
- PEO 12. Continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or is practicing and use appropriate learning resources.
- PEO 13. Be well versed with his medico-legal responsibilities.
- PEO 14. Undertake audit, use information technology tools and carry out research - both basic and clinical, with the aim of publishing the work and presenting the work at scientific forums.
- PEO 15. The student should be able to recognize the mental condition characterized by self absorption and reduced ability to respond to the outside world (e.g. Autism), abnormal functioning in social interaction with or without repetitive behaviour and/or poor communications, etc.

1.3.2 Map PEOs with Mission Statements:

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4
PEO1:	3	3	2	3
PEO2:	3	3	3	3
PEO3:	2	2	1	3
PEO4:	2	3	2	2
PEO5	3	3	2	3
PEO6	3	2	2	3
PEO7	3	3	2	3
PEO8	2	2	2	2
PEO9	3	3	2	3
PEO10	1	2	1	2
PEO11	3	3	2	3
PEO12	3	3	1	1
PEO13	2	3	1	2
PEO14	3	2	2	3
PEO15	2	3	2	1

1.3.3 Program Outcomes (PO's)

A. Cognitive Domain

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

- PO1. Basics of human anatomy as relevant to clinical practice e.g. surface anatomy of various viscera, neuro-anatomy, important structures/organs location in different anatomical locations in the body; common congenital anomalies.
- PO2. Basic functioning of various organ-system, control of vital functions, pathophysiological alteration in diseased states, interpretation of symptoms and signs in relation to pathophysiology.
- PO3. Common pathological changes in various organs associated with diseases and their correlation with clinical signs; understanding various pathogenic processes and possible therapeutic interventions possible at various levels to reverse or arrest the progress of diseases.
- PO4. Knowledge about various microorganisms, their special characteristics important for their pathogenetic potential or of diagnostic help; important organisms associated with tropical diseases, their growth pattern/life-cycles, levels of therapeutic interventions possible in preventing and/or eradicating the organisms.
- PO5. Knowledge about pharmacokinetics and pharmaco-dynamics of the drugs used for the management of common problems in a normal person and in patients with diseases kidneys/liver etc. which may need alteration in metabolism/excretion of the drugs; rational use of available drugs.
- PO6. Knowledge about various poisons with specific reference to different geographical and clinical settings, diagnosis and management.
- PO7. Research Methodology and Studies, epidemiology and basic Biostatistics.
- PO8. National Health Programmes.
- PO9. Biochemical basis of various diseases including fluid and electrolyte disorders; Acid base disorders etc.
- PO10. Recent advances in relevant basic science subjects.
- PO11. Preventive and environmental issues, including principles of preventive health care, immunization and occupational, environmental medicine and bioterrorism.
- PO12. Aging and Geriatric Medicine including Biology, epidemiology and neuropsychiatric aspects of aging.
- PO13. Clinical Pharmacology - principles of drug therapy, biology of addiction and complementary and alternative medicine.
- PO14. Genetics - overview of the paradigm of genetic contribution to health and disease, principles of Human Genetics, single gene and chromosomal disorders and gene therapy.
- PO15. Approach to patient with different systemic diseases; Immunology, Cardiovascular diseases, Respiratory system, Nephrology, Gastrointestinal diseases, Liver and gall bladder diseases, Hematologic diseases, Oncology, Metabolic diseases, Nutritional diseases, Endocrinology, Rheumatic diseases, Infectious diseases, Neurology, Psychiatry, Dermatology

B Affective domain

A post graduate student having qualified the MD (Medicine) examination should be able to

PO16. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

PO17. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

PO18. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor Domain The student should acquire competencies in the following tasks:

PO19. Clinical Assessment Skills

PO20. Procedural skills

PO21. Laboratory-Diagnostic Abilities

PO22. Interpretation Skills

1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4	PEO5	PEO6	PEO7	PEO8	PEO9	PEO10	PEO11	PEO12	PEO13	PEO14	PEO15
PO1	3	3	2	2	1	2	1	3	3	3	3	3	1	1	2
PO2	2	2	2	1	3	1	3	3	3	2	2	1	3	2	3
PO3	2	2	1	3	1	1	1	3	2	3	3	1	2	1	2
PO4	1	2	3	3	3	3	2	3	3	2	3	1	3	2	3
PO5	3	3	1	3	2	3	3	3	3	3	3	2	1	1	1
PO6	2	2	1	2	3	3	3	2	3	2	2	2	3	3	3
PO7	1	2	2	2	1	1	2	3	3	3	3	1	1	3	3
PO8	3	3	3	3	1	1	2	3	3	2	3	2	1	2	2
PO9	3	3	2	3	1	2	3	1	1	1	3	3	1	1	1
PO10	3	2	3	2	2	2	1	2	2	2	3	3	3	2	2
PO11	3	3	3	3	3	2	2	2	3	3	3	3	3	3	2
PO12	3	3	3	3	3	3	2	3	1	1	3	2	3	1	2
PO13	3	3	3	3	1	1	1	2	2	3	3	3	3	3	2
PO14	3	2	2	3	1	2	3	3	2	3	3	3	2	2	3
PO15	3	3	3	3	3	3	3	2	1	2	3	2	3	3	3
PO16	3	3	2	2	3	3	3	2	1	3	3	1	3	2	2
PO17	3	3	3	2	3	3	2	2	1	3	3	2	3	2	1
PO18	3	3	3	3	3	3	3	2	1	3	3	3	3	2	3

8															
PO1	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3
9															
PO2	3	3	3	3	2	3	3	“_“	“_“	2	3	1	3	3	1
0															
PO2	3	3	3	3	2	3	3	1	1	2	2	1	3	3	2
1															
PO2	3	3	3	3	3	3	3	1	1	3	3	2	3	2	3
2															

School: SMSR		Batch:
Program: MD MEDICINE		Current Academic Year: 2019-20
1	Programme Code	SMS1601

Syllabus

Course contents:

Basic Sciences

1. Basics of human anatomy as relevant to clinical practice
 - surface anatomy of various viscera
 - neuro-anatomy
 - important structures/organs location in different anatomical locations in the body
 - common congenital anomalies
2. Basic functioning of various organ-system, control of vital functions, pathophysiological alteration in diseased states, interpretation of symptoms and signs in relation to pathophysiology.
3. Common pathological changes in various organs associated with diseases and their correlation with clinical signs; understanding various pathogenic processes and possible therapeutic interventions possible at various levels to reverse or arrest the progress of diseases.
4. Knowledge about various microorganisms, their special characteristics important for their pathogenetic potential or of diagnostic help; important organisms associated with tropical diseases, their growth pattern/life-cycles, levels of therapeutic interventions possible in preventing and/or eradicating the organisms.
5. Knowledge about pharmacokinetics and pharmaco-dynamics of the drugs used for the management of common problems in a normal person and in patients with diseases kidneys/liver etc. which may need alteration in metabolism/excretion of the drugs; rational use of available drugs.
6. Knowledge about various poisons with specific reference to different geographical and clinical settings, diagnosis and management.
7. Research Methodology and Studies, epidemiology and basic Biostatistics.
8. National Health Programmes.
9. Biochemical basis of various diseases including fluid and electrolyte disorders; Acid base disorders etc.
10. Recent advances in relevant basic science subjects.

Systemic Medicine

11. Preventive and environmental issues, including principles of preventive health care, immunization and occupational, environmental medicine and bio-terrorism.
12. Aging and Geriatric Medicine:
 - Biology
 - epidemiology
 - neuro-psychiatric aspects of aging
13. Clinical Pharmacology:
 - principles of drug therapy
 - biology of addiction
 - complementary and alternative medicine
14. Genetics:
 - overview of the paradigm of genetic contribution to health and disease

- principles of Human Genetics
 - single gene and chromosomal disorders
 - gene therapy
15. Immunology:
- innate and adaptive immune systems
 - mechanisms of immune mediated cell injury
 - transplantation immunology
16. Cardio-vascular diseases:
- Approach to the patient with possible cardio-vascular diseases
 - heart failure
 - arrhythmias
 - hypertension
 - coronary artery disease
 - valvular heart disease
 - infective endocarditis
 - diseases of the myocardium and pericardium
 - diseases of the aorta and peripheral vascular system
17. Respiratory system:
- approach to the patient with respiratory disease
 - disorders of ventilation
 - asthma
 - Congenital Obstructive Pulmonary Disease (COPD)
 - Pneumonia
 - pulmonary embolism
 - cystic fibrosis
 - obstructive sleep apnoea syndrome and diseases of the chest wall, pleura and mediastinum
18. Nephrology:
- approach to the patient with renal diseases
 - acid-base disorders
 - acute kidney injury
 - chronic kidney disease
 - tubulo-interstitial diseases
 - nephrolithiasis
 - Diabetes and the kidney
 - obstructive uropathy and treatment of irreversible renal failure
19. Gastro-intestinal diseases:
- approach to the patient with gastrointestinal diseases
 - gastrointestinal endoscopy
 - motility disorders
 - diseases of the oesophagus
 - acid peptic disease
 - functional gastrointestinal disorders
 - diarrhea
 - irritable bowel syndrome
 - pancreatitis and diseases of the rectum and anus
20. Diseases of the liver and gall bladder:

- approach to the patient with liver disease
 - acute viral hepatitis
 - chronic hepatitis
 - alcoholic and non-alcoholic steatohepatitis
 - cirrhosis and its sequelae
 - hepatic failure and liver transplantation
 - diseases of the gall bladder and bile ducts
21. Haematologic diseases:
- Haematopoiesis
 - Anaemias
 - leucopenia and leucocytosis
 - myelo-proliferative disorders
 - disorders of haemostasis and haemopoietic stem cell transplantation
22. Oncology:
- Epidemiology
 - biology and genetics of cancer
 - paraneoplastic syndromes and endocrine manifestations of tumours
 - leukemias and lymphomas
 - cancers of various organ systems and cancer chemotherapy
23. Metabolic diseases - inborn errors of metabolism and disorders of metabolism.
24. Nutritional diseases - nutritional assessment, enteral and parenteral nutrition, obesity and eating disorders.
25. Endocrine - principles of endocrinology, diseases of various endocrine organs including diabetes mellitus.
26. Rheumatic diseases:
- approach to the patient with rheumatic diseases
 - osteoarthritis
 - rheumatoid arthritis
 - spondyloarthropathies
 - systemic lupus erythematosus (SLE)
 - polymyalgia
 - rheumatic fibromyalgia and amyloidosis
27. Infectious diseases:
- Basic consideration in Infectious Diseases
 - clinical syndromes
 - community acquired clinical syndromes
 - Nosocomial infections
 - Bacterial diseases - General consideration, diseases caused by gram – positive bacteria, diseases caused by gram - negative bacteria
 - o miscellaneous bacterial infections
 - o Mycobacterial diseases
 - o Spirochetal diseases
 - o Rickettsia
 - o Mycoplasma and Chlamydia
 - o viral diseases
 - o DNA viruses

o DNA and RNA respiratory viruses

o RNA viruses

- fungal infections, protozoal and helminthic infections .

28. Neurology - approach to the patient with neurologic disease, headache, seizure disorders and epilepsy, coma, disorders of sleep, cerebrovascular diseases, Parkinson’s disease and other movement disorders, motor neuron disease, meningitis and encephalitis, peripheral neuropathies, muscle diseases, diseases of neuromuscular transmission and autonomic disorders and their management.

29. The mental condition characterized by complete self absorption with reduced ability to communicate with the outside world (Autism), abnormal functioning in social interaction with or without repetitive behaviour and/or poor communication etc.

30. Dermatology:

- Structure and functions of skin
- infections of skin
- papulo-squamous and inflammatory skin rashes
- photo-dermatology
- erythroderma
- cutaneous manifestations of systematic diseases
- bullous diseases
- drug induced rashes
- disorders of hair and nails
- principles of topical therapy

Illustration of Structured Training-

Time Period	Description/Levels	Content	Responsibilities
Ist Month	Orientation	Basic cognitive skills	1. Combined duties 2. Supervised procedures
Ist Year	Beginners	Procedural abilities OPD & ward work	History sheet writing - Clinical abilities, -Procedural abilities (PA, PI)*, - Laboratory

			-diagnostic (All PI) -Communication skills O,A,PA - BLS & ACLS
IIInd Year	Intermediate	Intermediate degree of cognitive abilities Specialised procedural skills Emergency	Independent duties - All procedures -Respiratory management abilities (All PI) - Communication skills (PA, PI) - Writing thesis - Teaching UGs
III Year		Special skills Intensive critical care	Advanced levels of independent duties, - casualty calls, - ICU, NICU, - UG teaching

Mode of examination

ASSESSMENT FORMATIVE ASSESSMENT,

During the training programm 16 Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills,

interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and practical/clinical examination. Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs.

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT,

namely, assessment at the end of training The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The Post graduate examination shall be in three parts:

1. Thesis –

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature. Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory:

The examinations shall be organised on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period. There will be four theory papers, as below:

Paper I: Basic Medical Sciences (at the end of first year of training)

Paper II: Medicine and allied specialties including pediatrics, dermatology & psychiatry

Paper III: Tropical Medicine and Infectious Diseases

Paper IV: Recent Advances in Medicine

3. Clinical / Practical and Oral/viva voce Examination:

The final clinical examination should include: • cases pertaining to major systems • stations for clinical, procedural and communication skills • Log Book Records and day-to-day observation during the training • Oral/viva

voce examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject

Recommended Reading Text Books (latest edition)

- API Text book of Medicine
- Davidson's Principles and Practice of Medicine
- Harrison's Principles & Practice of Medicine
- Oxford Text book of Medicine
- Kumar & Clark : Book of Clinical Medicine
- Cecil : Text Book of Medicine Reference books
- Hurst : The Heart
- Braunwald - Heart Disease: A Textbook of Cardiovascular Medicine
- Marriot's Practical Electrocardiography
- Crofton and Douglas : Respiratory Diseases
- Clinical Methods
- Hutchinson's Clinical Methods
- Macleod's Clinical examination
- John Patten : Neurological Differential Diagnosis
- Neurological examination in Clinical Practice by Bickerstaff

Annexure I

Postgraduate Students Appraisal Form Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1	Journal based / recent advances learning				
2	. Patient based /Laboratory or Skill based learning				

3	Self directed learning and teaching				
4	Departmental and interdepartmental learning activity				
5	External and Outreach Activities /				
6	CMEs				
7	Thesis / Research work				
8	Log Book Maintenance				

Publications
Yes/ No

 Remarks* _____

_____ *REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD