Program and Course Structure

School of Medical Science and Research Department

MD (Pulmonary Medicine)
Session:2021-24
Program Code: SMS1101

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

Vision of the School of Medical Sciences and Research

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

1.3.1 Programme Educational Objectives (PEO)

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

PEO1. Practice efficiently Respiratory 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.

PEO3. Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards.

PEO4. Plan and deliver comprehensive treatment using the principles of rational drug therap.

PEO5. Plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty;.

PEO6. Recognize conditions that may be outside the area of the specialty/ competence and refer them to an appropriate specialist

PEO7. Demonstrate skills in documentation of case details including epidemiological data

PEO8. Play the assigned role in the implementation of National Health Programs

PEO9. Demonstrate competence in basic concepts of research methodology and clinical epidemiology; and preventive aspects of various disease states

PEO10. Be a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner

PEO11. Be well versed with his medico-legal responsibilitie

1.3.2 Map PEOs with Mission Statements:

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4
PEO1	3	2	2	3
PEO2	3	3	2	3
PEO3	3	2	3	3
PEO4	3	3	2	3
PEO5	2	2	3	2
PEO6	2	1	1	2
PEO7	2	3	2	3
PEO8	3	3	3	2
PEO9	3	3	3	3
PEO10	2	3	1	3
PEO11	3	3	2	3

Affective Domain

PO1. 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.
PO2. 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.
PO3. 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.

Psychomotor domain

At the end of the course, the student should acquire following clinical skills and be able to:

PO4. Interview the patient, elicit relevant and correct information and describe the history in chronological order.
PO5. Conduct clinical examination, elicit and interpret clinical findings and diagnose common pulmonary disorders and emergencies.
PO6. perform simple, routine investigative and office procedures required for making the bedside diagnosis, especially sputum collection and examination for etiologic organisms especially Acid Fast Bacilli (AFB), interpretation of the chest x-rays and lung function tests.
PO7. Interpret and manage various blood gases abnormalities in various pulmonary diseases.
PO8. Develop management plans for various pulmonary diseases.
PO9. Assist in the performance of common procedures, like bronchoscopic examination, pleural aspiration and biopsy, pulmonary physiotherapy, endotracheal intubation and pneumo-thoracic drainage / aspiration etc.
PO10. Recognize emergency situations in intensive care, respond to these appropriately and perform basic critical care monitoring and therapeutic procedures.
PO11. collect, compile, analyse, interpret, discuss and present research data.
PO12. Teach pulmonary medicine to undergraduate and postgraduate students

1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4	PEO5	PEO6	PEO7	PEO8	PEO9	PEO10	PEO11	PEO12	PEO13
PO1	3	3	3	3	1	1	1	“”	“”	“”	“”	“”	“”
PO2	2	2	“”	1	3	1	3	“”	3	1	“”	1	3
PO3	2	2	1	3	1	“”	1	3	2	3	“”	1	2
PO4	1	2	3	3	3	2	2	3	3	“”	“”	1	3
PO5	3	3	3	3	“”	1	3	“”	3	“”	3	“”	3
PO6	3	2	1	1	3	3	3	2	3	“”	“”	“”	3
PO7	“”	2	3	“”	“”	1	“”	2	1	1	“”	“”	1
PO8	3	3	3	“”	“”	“”	“”	3	2	2	“”	2	1
PO9	2	3	“”	“”	“”	“”	“”	3	3	“”	2	“”	3
PO10	“”	3	3	2	“”	“”	“”	2	2	2	3	3	3
PO11	“”	3	3	“”	“”	“”	“”	2	3	3	3	3	3
PO12	3	2	“”	3	1	“”	“”	“”	“”	“”	“”	“”	“”

School: SMSR		**Batch:**
Program: MD RESPIRATORY MEDICINE		**Current Academic Year: 2019-20**
1	Programme Code	SMS0301

Syllabus

Course contents:
The student should acquire knowledge in the following:

I. Basic Sciences

A. Anatomy and Histology of Respiratory System

1. Development and Anatomy of Respiratory System
2. Applied embryology of lungs, mediastinum and diaphragm
3. Developmental anomalies

B. Physiology and Biochemistry

1. Assessment of pulmonary functions
2. Control of ventilation; pulmonary mechanics
3. Ventilation, pulmonary blood flow, gas exchange and transport
4. Non-respiratory metabolic functions of lung
5. Principles of electrocardiography
6. Inhalation kinetics and its implication in aerosol therapy, and sputum induction etc.
7. Acid-base and electrolyte balance
8. Physiology of sleep and its disorders
9. Pulmonary innervation and reflexes
10. Pulmonary defence mechanisms
11. Principles of exercise physiology and testing
12. Physiological changes in pregnancy, high altitude, aging
13. Physiological basis of pulmonary symptoms

C. Microbiology

1. Mycobacterium tuberculosis and other mycobacteria
2. Bacteria causing pulmonary diseases
3. Atypical organisms and respiratory tract infections
4. Anaerobes in pleuropulmonary infections
5. Laboratory diagnosis of non-tubercular infections of respiratory tract
6. Laboratory diagnosis of TB including staining, culture and drug sensitivity testing
7. Virulence and pathogenecity of mycobacteria
8. Respiratory viruses: Viral diseases of the respiratory system and diagnostic methods
9. Respiratory fungi: (i) Classification of fungal diseases of lung: candidiasis, Actinomycosis, Nacardiosis, Aspergillosis, Blastomycosis etc. (ii) Laboratory diagnostic procedures in pulmonary mycosis
10. Opportunistic infections in the immuno-ompromised individuals
11. HIV and AIDS. Virological aspects, immuno-pathogenesis, diagnosis
12. Parasitic lung diseases

D. Pathology

1. Acute and chronic inflammation: Pathogenetic mechanisms in pulmonary diseases
2. Pathology aspects of Tuberculosis
3. Pathology aspects of Pneumonias and bronchopulmonary suppuration
4. Chronic bronchitis and emphysema, asthma, other airway diseases
5. Occupational lung diseases including Pneumoconiosis
6. Interstitial lung diseases including sarcoidosis, connective tissue diseases, pulmonary vasculitis syndromes, pulmonary eosinphilias
7. Tumours of the lung, mediastinum and pleura

E. Epidemiology

1. Epidemiological terms and their definitions
2. Epidemiological methods
3. Epidemiology of tuberculosis, pneumoconiosis, asthma, lung cancer, COPD and other pulmonary diseases
4. National Tuberculosis Control Programme and RNTCP; Epidemiological aspects of BCG
5. Epidemiological aspects of pollution-related pulmonary diseases
6. Research methodology, statistics and study designs

F. Allergy and Immunology

1. Various mechanisms of hypersensitivity reactions seen in pulmonary diseases
2. Diagnostic tests in allergic diseases of lung - *in vitro* and *in vivo* tests, bronch provocation test
3. Immunology of tuberculosis, Sarcoidosis and other diseases with an immunological basis of pathogenesis

G. Pharmacology

1. Pharmacology of antimicrobial drugs
2. Pharmacology of antitubercular drugs
3. Pharmacology of antineoplastic and immunosuppressant drugs
4. Bronchodilator and anti-inflammatory drugs used in pulmonary diseases
5. Drugs used in viral, fungal and parasitic infections
6. Other drugs pharmacokinetics and drugs interaction of commonly used drugs inpulmonary diseases
7. Pharmacovigilance

II. Clinical Pulmonary Medicine

Clinical pulmonary medicine covers the entire range of pulmonary diseases. All aspects of pulmonary diseases including epidemiology, aetiopathogenesis, pathology, clinical features, investigations, differential diagnosis and management are to be covered.

A. Infections

1. Tuberculosis

1. Aetiopathogenesis
2. Diagnostic methods
3. Differential diagnosis
4. Management of pulmonary tuberculosis; RNTCP, DOTS, and DOTS-Plus; International Standards of TB Care
5. Complications in tuberculosis
6. Tuberculosis in children
7. Geriatric tuberculosis
8. Pleural and pericardial effusion and empyema
9. Mycobacteria other than tuberculosis
10. Extrapulmonary tuberculosis
11. HIV and TB; interactions of antitubercular drugs with antiretrovirals
12. Diabetes mellitus and tuberculosis
13. Management of MDR and XDR tuberculosis

2. Non-tuberculous infections of the lungs

1. Approach to a patient with pulmonary infection
2. Community-acquired pneumonia
3. Hospital-associated pneumonia, ventilator-associated pneumonia
4. Unusual and atypical pneumonias including bacterial, viral, fungal and parasitic and ricketsial, anerobic
5. Bronchiectasis, lung abscess and other pulmonary suppurations
6. Acquired immunodeficiency syndrome and opportunistic infections in immuno-compromised host
7. Principles governing use of antibiotics in pulmonary infections
8. Other pneumonias and parasitic infections, Zoonosis

B. Non-infectious Lung Diseases

3. Immunological disorders

1. Immune defence mechanisms of the lung
2. Sarcoidosis
3. Hypersensitivity pneumonitis and lung involvement
4. Eosinophilic pneumonias and tropical eosinophilia
5. Pulmonary vasculitides
6. Connective tissue diseases involving the respiratory system
7. Interstitial lung disease of other etiologies
8. Reactions of the interstitial space to injury, drugs
9. Occupational and environmental pulmonary diseases

4. Other non-infectious disorders of the lungs and airways

1. Aspiration and inhalational (non-occupational) diseases of the lung
2. Drug induced pulmonary diseases
3. Bullous lung disease
4. Uncommon pulmonary diseases (metabolic, immunological, unknown etiology), pulmonary haemorrhagic syndromes
5. Other pulmonary diseases of unknown etiology including PLCH, LAM, PAP, alveolar microlithiasis
6. Cystic fibrosis and disorders of ciliary motility
7. Obesity-related pulmonary disorders
8. Upper airways obstruction syndromes
9. Occupational lung diseases and pneumoconiosis
10. Air-pollution induced diseases, toxic lung and other inhalational injuries
11. Health hazards of smoking
12. Drug-induced lung diseases

5. Pulmonary Circulatory disorders

1. Pulmonary hypertension and cor pulmonale
2. Pulmonary edema
3. Pulmonary thromboembolic diseases and infarction
4. Cardiac problems in a pulmonary patient and pulmonary complications produced by cardiac diseases

6. Obstructive diseases of the lungs

1. Asthma including allergic bronchopulmonary aspergillosis, specific allergen immunotherapy and immunomodulation
2. Chronic obstructive lung disease and diseases of small airways
3. Special aspects of management including Long term oxygen therapy, Inhalation therapy and Pulmonary rehabilitation

7. Tumors of the lungs

1. Comprehensive knowledge of neoplastic and non-neoplastic diseases of lung including epidemiology, natural history, staging, and principles of treatment (medical, surgical, and radiation)
2. Solitary pulmonary nodule

8. Diseases of the mediastinum

1. Non-neoplastic disorders
2. Benign and malignant (primary and secondary) neoplasms and cysts

9. Disorders of the pleura

1. Pleural dynamics and effusions
2. Non-neoplastic and neoplastic pleural diseases

3. Pneumothorax
4. Pyothorax and broncho-pleural fistula
5. Fibrothorax

10. Critical Care Pulmonary Medicine

1. Management of emergency problems of different pulmonary diseases
2. Adult respiratory distress syndrome
3. Respiratory failure in the patient with obstructive airway disease
4. Respiratory failure in other pulmonary diseases
5. Management of sepsis
6. Respiratory and haemodynamic monitoring in acute respiratory failure
7. Non-invasive and Mechanical ventilation
8. Principles of critical care, diagnosis and management of complications; severity of illness scoring systems
9. Ethical and end-of-life issues in critical care

11. Extrapulmonary manifestations of pulmonary diseases

12. Sleep-related pulmonary diseases

1. Polysomnography
2. Sleep apneas
3. Other sleep-disordered breathing syndromes

13. Miscellaneous aspects

1. Diseases of the diaphragm
2. Disorders of chest wall
3. Obesity-related pulmonary disorders
4. Oxygen therapy
5. End-of-life care
6. Aerospace Medicine
7. Pulmonary problems related to special environments (high altitude, diving, miners)
8. Assessment of quality of life using questionnaires
9. Health impacts of global warming

14. Preventive Pulmonology

1. Principles of smoking cessation and smoking cessation strategies
2. Cardiopulmonary rehabilitation
3. Preventive aspects of pulmonary diseases
4. Vaccination in pulmonary diseases

III. Surgical aspects of Pulmonary Medicine

1. Pre- and post-operative evaluation and management of thoracic surgical patients
2. Chest trauma/trauma related lung dysfunction
3. Lung transplantation

TEACHING AND LEARNING METHODS

Postgraduate teaching programme General principles Acquisition of practical competencies being the keystone of PG medical education, PG training should be skills oriented. Learning in PG program should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort. Teaching methodology This should include regular bedside case presentations and demonstrations, didactic lectures, seminars, journal clubs, clinical meetings, and combined conferences with allied 11 departments.

The post graduate student should be given the responsibility of managing and caring for patients in a gradual manner under supervision. Formal teaching sessions In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary.

The departments may select a mix of the sessions, as given under formative assessment. Further, the student should: • Attend accredited scientific meetings (CME, symposia, and conferences). • Attend additional sessions on resuscitation, basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to medical practice are suggested. • There should be a training program on Research methodology for existing faculty to build capacity to guide research. • The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns. • A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination. • Log book: During the training period, the post graduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs and Casualty. This should indicate the procedures assisted and performed, and the teaching sessions attended. The Log book shall be checked and assessed periodically by the faculty members imparting the training.

Thesis

All MD (Pulmonary Medicine) post graduate students should carry out work on an assigned topic under the direct guidance of a recognised post graduate teacher. A written

protocol of the proposed work should be submitted before the end of the first 6 months. Subsequently, the post graduate student should carry out the proposed work for at least 1 year (not inclusive of the period for submitting the protocol and writing-up the final thesis).

ASSESSMENT

ASSESSMENT FORMATIVE ASSESSMENT, ie., assessment during training 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,

ie., 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. 13 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 Examination: 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 shall be four theory papers:

Paper I: General pulmonary medicine and basic sciences;
Paper II: Clinical pulmonary medicine including medical emergencies;
Paper III: Clinical pulmonary medicine including critical care medicine;
Paper IV: Recent advances in pulmonary medicine, and research methodology.

The final qualifying examination should include an assessment of clinical skills in the form of case presentations and discussions. Other rules laid down by the MCI regarding M.D. examinations shall apply here as well. 3. Practical/Clinical and Oral/viva voce Examination: The post graduate students shall examine a minimum of one long and two short cases. Oral/viva voce Examination The oral examination shall be thorough and shall aim at assessing the knowledge and competence of the post graduate student on the subject, investigative procedures, therapeutic technique and other aspects of the specialty which form a part of the examination.

Recommended reading: Books (latest edition) 1. Harrison's Principles of Internal Medicine ed. Petersdorf (McGraw Hill) 2. Cecil Text book of Medicine ed. Wyngaarden 3. Crofton & Douglas Respiratory diseases ed. Seaton et al (Oxford) 4. Pulmonary diseases & disorders by Fishman (McGraw Hill) 5. Textbook on Pulmonary disease by Fraser & Pare 14

6. Asthma by Clarke et al 7. Bronchoscopy by Straddling 8. Tuberculosis by SK Sharma 9. Lung diseases in the Tropics ed. OP Sharma (Marcel Dekker) 10. The Normal Lung by Murray (Saunders) 11. Pulmonary Function Testing by Clausen (Academic Press) 12. Respiratory Physiology by J.B. West (Williams & Wilkins) 13. Physiology of Respiration by J.H. Comroe (Yearbook Med Pub.) 14. Respiratory Function in disease by Bates et al (Saunders) Journals 03-05 international Journals and 02 national (all indexed) journals

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