

**FACULTY OF MEDICAL SCIENCES**  
**UNIVERSITY OF DELHI**  
**दिल्ली विश्वविद्यालय**

FMDS/330/10(2)/Minutes/2022/

**MINUTES**

An emergent meeting of the Faculty of Medical Sciences was held on **Tuesday, 19<sup>th</sup> July, 2022 at 3.00 p.m.** in the Committee Room, Faculty of Medical Sciences, 7<sup>th</sup> Floor, VPCI Building, University of Delhi, Delhi-110007.

The attendance of the members who have attended the meeting is Annexed.

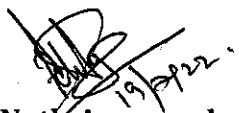
Shri Deepak Vats, Joint Registrar, Faculty of Medical Sciences was present in the meeting.

Sh. Ashwani Kumar, Assistant Registrar assisted the Faculty in its deliberations.

<b>Item No.1</b>	The Faculty considered and approved the recommendations of the Committee of Courses and Studies of Department of Pulmonary Medicine regarding draft ordinance (course curriculum, admission criteria, scheme of examination etc.) of M.Sc.(Respiratory Therapy) course and recommended it to the Academic Council for consideration. <b>(Annexure-I)</b>
<b>Item No.2</b>	The item was withdrawn.

The meeting ended with a vote of thanks to the Chair.

  
**Deepak Vats**  
**Joint Registrar (Medical)**

  
**Prof. Aditya Nath Aggarwal**  
**Dean, Faculty of Medical Sciences**  
**(Chairperson)**

**University of Delhi**

**Ordinance of**  
**Master of Science (M.Sc.) in Respiratory Therapy**  
**(Two Years full time Programme)**

**Faculty of Medical Sciences**  
**Department of Pulmonary Medicine**

**w.e.f Session 2022-23**



## University of Delhi

### Master of Science (M.Sc.) RESPIRATORY THERAPY

#### Two Years Full Time Programme

##### **M.Sc. Respiratory Therapy:**

M. Sc Respiratory Therapy is a postgraduate medicine course. A respiratory therapist is a specialized healthcare practitioner trained in pulmonary medicine in order to work therapeutically with people suffering from pulmonary disease. Respiratory therapists can educate, assist in diagnosis, and treat people who are suffering from heart and lung problems. They are primary clinicians in conducting tests to measure lung function, sleep study, allergy testing, bronchoscope, pulmonary rehabilitation and patient education.

##### **Programme:**

The objective of the programme is to impart training in the respiratory therapy including pulmonary function test, intensive care unit, polysomnography, bronchoscopy, pulmonary rehabilitation and allergy, immunotherapy and make them proficient in all these techniques. All the above procedures are considered basis for diagnosis and treatment in many types of pulmonary disease. The course will be conducted by the institute consisting of 7 (seven) students per year.

##### **Overall Objectives:**

1. To enable graduates to learn in a highly productive environment that gives them the core and comprehensive skills to deal with diagnostics applied in the fields of RESPIRATORY THERAPY.
2. To enable graduates to have basic research in the field of respiratory therapy.

##### **Scope of the programme:**

1. To train highly-skilled respiratory therapists to assist doctors in intensive care, operating rooms and outpatient clinics
2. To intensify research and scholarship in respiratory care
3. To develop excellent educators

**Programme content:**

1. Applied aspect of human Anatomy, physiology and biochemistry
2. Applied aspect of pharmacology, Microbiology and pathology
3. Equipment in respiratory medicine and respiratory therapy
4. Pulmonary Medicine
5. Applied Science
6. Principles of research methodology, biostatistics and medical ethics.

**Practical experience with essential technical aspects:**

1. Performing PFT calibration, maneuvers and testing,
2. Fibro-optic bronchoscopy preparation, calibration, maneuvers and maintain of bronchoscope.
3. Performing various type of polysomnography, scoring and titration.
4. Performing in-vivo and in-vitro allergy testing and immunotherapy.
5. Performing all intensive care procedures ( including endo-tracheal intubation, insertion of central line, performing ABG, non-invasive and invasive mechanical ventilation)

Learn high-level interpretive strategies, reinforced with case based clinical examples. Hand on demonstrations and lectures will address appropriate reference, newer equipment modalities, quality control, biologic process control, infection control, laboratory standards for hygiene, personnel qualifications, technician's role in qualifications, technician's role in quality, report generation and formatting.

**Programme Structure:**

Master of Science in Respiratory Therapy is two years full time course consisting of two parts to be known as Part I (First Year) & Part II (Second Year)

		Semester-Odd	Semester-Even	Number of papers per semester
<b>Part I</b>	First Year	Semester – 1	Semester – 2	Three with Practical
<b>Part II</b>	Second Year	Semester – 3	Semester – 4	Three with Practical

- The duration of examination will be of three hours.
- It is mandatory for each student to complete a Dissertation, assigned at the end of 2<sup>nd</sup> semester and goes on until 4<sup>th</sup> semester.

**Admission Criteria and Procedure:****Eligibility:**

The Indian national who have passed the following Bachelor Degree from a recognized University/Institute

- B.Sc. degree in Medical Technology with Respiratory Therapy as specialization or equivalent from a recognized university, OR
- Bachelors in Life Sciences from a recognized University or equivalent and diploma/certificate program in Respiratory Therapy, OR
- Bachelors in Physiotherapy / Nursing from a recognized University or equivalent.

**Entrance Examination:**

The eligible candidate shall be required to appear in the entrance examination.

English shall be the medium of instructions and examination.

**Duration of course:**

TWO years (Full Time).

**Span Period:**

A student is required to complete the course as a regular student in two years (Full Time).

The span period shall be 4(four) years.

**Attendance**

- 85% attendance required to be eligible to appear in the examination.
- Dissertation/Project is required to be submitted by the end of 2<sup>nd</sup> year.

**Reservation:**

Reservation for ST/SC/OBC/PH/EWS categories will be as per rules of the University.

**How to apply:**

Interested eligible candidate may submit the application form in prescribe format after advertisement.

**Documents required:**

- Degree certificate (self attested)
- Photograph passport size(3 Nos.)
- Residency Proof (Any valid identity proof (self attested) viz. Aadhar card, Passport, Pan card, Voter ID Card, Driving license, Electricity bill, Water bill, etc.)
- Selected candidates will be required to pay Rs. 26,100/- (fee & other charges Rs. 16,100 + security deposit Rs. 10,000) through online mode.
- The required fee for the course will be paid annually as per norms of University of Delhi.
- Fee & other charges may changes as per university norms.

**Fee and Other Charges:**

Fees and other Charges\* for the course is to be paid by the student at the time of admission in the college. Fee structure will be as follows:

1. **Tuition fee (Annual)	Rs.	13,000.00
2. Library fee (Annual)	Rs.	500.00
3. Athletic fee (Annual)	Rs.	10.00
4. Cultural Council Fee (Annual)	Rs.	5.00
5. N.S.S. fee (Annual)	Rs.	20.00
6. University Development Fund (Annual)	Rs.	900.00
7. Faculty Management fee (Annual)	Rs.	1,465.00
8. University Enrolment Fee	Rs.	200.00

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Total Rs. 16,100.00

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\*Subject to change as per University norms

(\*\*) Note: 1. The students belonging to Schedule Caste/ Schedule Tribe Categories whose parents income is such that they are not paying Income Tax be exempted from the payment of tuition fee and admission fee (University circular No. SPLC/Fee Exemp./SC/ST/2015-16 dated 09.09.2015).

2. Security Deposit (Caution Money) of Rs. 10,000 (refundable) is to be paid by the student at the time of admission besides Course fee and other charges.

**Hostel Facility:**

The Hostel accommodation may be allotted as per norms subject to availability of rooms.

**Teaching Faculty/Infrastructure/Equipments****Teaching Faculty:**

- All the teaching faculty of pulmonary medicine and intensive care department.
- Senior resident of pulmonary medicine department.
- All teaching faculty of physiology, biochemistry, microbiology, pathology, pharmacology, radiology, allergy immunology and anesthesiology.

**Infrastructure:**

- The existing manpower and infrastructural will be utilized for the course.

## **EQUIPMENTS:-**

Understanding the principle, mechanism of function, setting up, running care, sterilization and maintenance of the following equipments.

1. Bronchoscope: Rigid and Flexible
2. Thoracoscopy
3. Defibrillators
4. Central ICU monitoring system
5. Pulse Oximeter
6. ABG machine
7. Oxygen delivery devices
8. Spirometer and DLCO system
9. Body plethysmography
10. Nebulizer and Inhalation Devices and Mask
11. Invasive mechanical Ventilators
12. Non invasive ventilators ( CPAP and BIPAP)
13. Polysomnography system
14. Cardiopulmonary exercise machine
15. Pressure transducing systems and hemodynamic calculation
16. Videolaryngoscope
17. FeNO machine

## SYLLABUS AND CURRICULUM

### PART I (First Year)

#### **I. ANATOMY:-**

1. Basic anatomy of the airways and lungs.
2. Basic anatomy of the heart.
3. Basic anatomy of pleura and diaphragm
4. Blood supply and venous drainage of lungs.
5. Blood supply and venous drainage of heart.
6. Development and Congenital anomalies of lung

#### **II. PHYSIOLOGY:-**

1. Lung volumes and Capacities.
2. Mechanism of Respiration.
3. Oxygen dissociation curve, diffusing of gases.
4. Pulmonary Function measurements.
5. Diffusion studies and Whole Body Plethysmography
6. Gas exchange in the lung.
7. Gas transport between the lung and the tissues.
8. Regulation of respiration.
9. Ventilation perfusion ratios.
10. Cardiac cycle.
11. Physiology of Sleep and Polysomnography.

#### **III. BIOCHEMISTRY**

1. Carbohydrates, Proteins, Fat, Structures, Synthesis & Metabolism
2. Electrolyte and blood homeostasis
3. Arterial Blood gases analysis and interpretation
4. Surfactant -- Constituent & Functions

#### **IV. MICROBIOLOGY**

1. Classification of Micro organisms
2. Basic of pulmonary mycosis
3. Mycobacteria
4. common gram positive and negative bacteria
5. Methods of Sterilisation & Disinfection
6. Airborne Infection control
7. How to take specimens from ET Tube, FOB, Thoracoscope etc.

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## **V. PATHOLOGY**

1. General pathology ( Cell Injury, Inflammation, repair, immune system)
2. Acute and Chronic Inflammation, General Features of Inflammation
  - a. Pathology of the respiratory system
  - b. Pneumonia
  - c. Obstructive lung diseases including asthma and COPD
  - d. Diffuse parenchymal lung diseases
  - e. Acute respiratory distress syndrome
  - f. Sleep disorders
  - g. Chest wall diseases
  - h. Pulmonary vascular diseases

## **VI. PHARMACOLOGY:-**

1. Antibiotics
2. Corticosteroids and immunosuppressant
3. Adrenergic receptor agonist and antagonist
4. Anticholinergic receptor agonist and antagonist
5. Mucolytics
6. Inhalation therapy
7. Immunotherapy
8. Anti Tubercular drugs
9. Pharmacotherapy of asthma and COPD

## **PART II (Second Year)**

## **VII. PULMONARY MEDICINE**

1. Asthma
2. COPD
3. ARDS
4. Pneumonia
5. Intestinal Lung Disease
6. Respiratory Failure
7. Tuberculosis
8. Occupational Lung Diseases
9. Bronchiectasis

10. Pleural Effusion/ Emphysema
11. Pneumothorax
12. Chest wall diseases
13. Management of ICD
14. Pulmonary Embolism
15. Sleep disordered Breathing
16. Lung cancer
17. Pulmonary physiotherapy
18. Pulmonary Rehabilitation
19. Respiratory Allergy

#### **VIII. APPLIED SCIENCES:**

Training and proficiency testing in following procedures

1. Basic ICU practices
  - a. Airway management including endotracheal intubation
  - b. Basic and advanced cardiac life support
  - c. Management of patients on invasive and non invasive mechanical ventilation
  - d. Choice of oxygen delivery devices for different patients with cardiopulmonary diseases
  - e. Choice of nebulisations system for different patients with cardiopulmonary diseases
  - f. Care of peripheral venous catheters (including insertion of venous catheters)
  - g. Arterial blood gas analysis (including radial artery sampling)
  - h. Care of central venous catheters
2. Measurement and interpretation of various lung function tests- Spirometry, diffusion capacity and lung volumes.
3. Performa and interpretation of polysomnography
4. Patient safety in intensive care unit
5. Procedural assistance in the bronchoscopy suite
6. Sterilization practices for various equipments listed above
7. Principles of asepsis and infection control.

## **IX. RESEARCH METHODOLOGY, BIOSTATISTICS AND MEDICAL ETHICS**

1. Basic of biostatistics
2. Basic of research methodology
3. Record keeping and stock maintenance
4. Electronic and digital data recording and management in the intensive care unit
5. Intensive care unit ethics and end of life care
6. Medicolegal implications and medical ethics

### **DETAILS OF THE ROTATION PERIOD.**

Department	Rotation period
a) Respiratory ICU	10months
b) Pulmonary function lab	3months
c) Bronchoscopy suite	3months
d) Sleep laboratory	3months
e) Allergy Clinic	1½months
f) Tobacco cessation Clinic	1½months
g) Patient Education Centre	2months

### **DISSERTATION**

The candidate will have to submit a dissertation which will be evaluated by the external/internal examiners at the time of viva voce examination of the candidate during the second year and 10% weightage will be given to the candidate for the dissertation at the time of clinical/practical and viva voce examination of the second year. The candidate will ask to present his dissertation before the external/internal examiners. The final dissertation fully approved by the internal/external examiner will be submitted to the office of the Head of Institution along with the result. The office of the Head of Institution will send the dissertation to the library for record. The dissertation should be written under the following heading:-

1. Introduction
2. Aims and objectives
3. Review of literature
4. Material and Methods
5. Observation
6. Discussion

7. Conclusion
8. Summary
9. Bibliography
10. Table and Diagrams
11. Annexures (if any)
12. Statistical analysis
13. Master chart

**SCHEME OF PAPERS/EXAMINATION:**

<b>SEMESTER I</b>		
	<b>Subject</b>	<b>Marks</b>
<b>Paper I</b>	<b>Basic Sciences I</b> - Applied anatomy and physiology of the cardiopulmonary system	100
<b>Paper II</b>	<b>Basic Sciences II</b> - Applied biochemistry - Pathology of respiratory diseases	100
<b>Paper III</b>	<b>Equipments Applied to Respiratory Care</b> - Understanding of equipments	100
	Practical & Viva	400
	Internal Assessment*	100
<b>Grand Total</b>		<b>800</b>

<b>SEMESTER II</b>		
	<b>Subject</b>	<b>Marks</b>
<b>Paper I</b>	<b>Applied Microbiology</b> - Sterilization techniques - Infection control measures in the intensive care unit	100
<b>Paper II</b>	<b>Drugs &amp; Ethics in Respiratory Care</b> - Drugs used in respiratory care - Record keeping in the ICU, Ethics in ICU and end of life care	100
<b>Paper III</b>	<b>Clinical Applications in Respiratory Care</b> - Resuscitation techniques - Patient's safety in intensive care unit	100
	Practical & Viva	400
	Internal Assessment*	100
<b>Grand Total</b>		<b>800</b>

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SEMESTER III		
	Subject	Marks
Paper I	<b>Advance Physiology &amp; Applied to Respiratory Care</b> - Pathophysiology of acute respiratory failure - Acid base and electrolyte imbalance	100
Paper II	<b>Oxygen &amp; Aerosol Therapy</b> - Oxygen therapy - Oxygen delivery devices - Aerosol dynamics - Aerosol Theory	100
Paper III	<b>Sleep Pathophysiology &amp; Treatment</b> - Sleep physiology and pathophysiology applied to respiratory care practices - Non Invasive ventilation	100
	Practical & Viva	400
	Internal Assessment*	100
<b>Grand Total</b>		<b>800</b>

SEMESTER IV		
	Subject	Marks
Paper I	<b>Assisted Ventilatory Support</b> - Maintenance of mechanical ventilators - Mechanical ventilation of normal lung and lung with obstructive and restrictive pathology - Modes of mechanical ventilators : basic and advanced	100
Paper II	<b>Procedures &amp; Practices of Respiratory Care I</b> - Suctioning techniques - Basic and advanced cardiac life support - Airway management techniques	100
Paper III	<b>Procedures &amp; Practices of Respiratory Care II</b> - Management of central venous catheters - Respiratory care procedures: Fiberoptic bronchoscopy - Rigid bronchoscopy, thoracoscopy, endotracheal intubation, pulmonary function test, skin prick test	100
	Practical & Viva	400
	Internal Assessment*	100
	Dissertation	100
<b>Grand Total</b>		<b>900</b>

\*Internal assessment will be based on theory and practical in house examination before the University examination.

**Practical assessment. Max. marks 400 & passing marks 50%**

<b>SEMESTER I</b> <ul style="list-style-type: none"><li>• Setting up of ventilator</li><li>• Interpretation of arterial blood gases</li><li>• Pulmonary function test including spirometry, cardiopulmonary exercise testing, body plethysmography, helium dilution techniques.</li></ul>
<b>SEMESTER II</b> <ul style="list-style-type: none"><li>• Setting and delivery of cardiac defibrillator</li><li>• Setting up bronchoscope</li><li>• Setting and monitoring polysomnography</li></ul>
<b>SEMESTER III</b> <ul style="list-style-type: none"><li>• Troubleshooting of mechanical ventilator not in patients</li><li>• Monitoring during mechanical ventilation</li><li>• Trouble shooting during fiberoptic and rigid bronchoscopy</li></ul>
<b>SEMESTER IV</b> <ul style="list-style-type: none"><li>• Choice of oxygen delivery devices</li><li>• Basic and advanced cardiac life support</li><li>• Performance of polysomnography</li><li>• Proficiency test of SPT</li></ul>

**Passing Criteria/Award of Degree**

**Passing Criteria:**

- 40% of marks in the University Theory Examinations
- 50% of marks in the Practical with Viva
- 50% of marks in aggregate in Theory, I.A & Viva taken together.
- **Distinction:** The candidate who obtained 75% marks of the aggregate marks or above
- **1<sup>st</sup> Division:** The candidate who obtained 60% marks or above but less than 75% marks.
- **2<sup>nd</sup> Division:** The candidate who obtained 50% marks or above but less than 60% marks.

**Award of Degree:**

- To obtain Post Graduate Degree Certificate (M.Sc. Respiratory Therapy) a candidate needs to complete the 2 years regular course with a minimal 85% attendance, needs to submit a project and to fulfill the passing criteria and other provisions given in the Ordinance(s).

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