

# UNIVERSITY OF DELHI

CNC-II/093/1(23)/2022-23/135

Dated: 09.08.2023

## NOTIFICATION

### Sub: Amendment to Ordinances

The following Amendment to Ordinances of the University has been approved by the Executive Council at its meeting held on 18.08.2022 and are notified for information and necessary action, if any, to all the concerned:

1. **Amendment to Appendix II to Ordinance V (2) & VII. [E.C Res. No. 18-1-15 dated 18.08.2022]** regarding Ordinance (Course Curriculum, Admission Criteria, Scheme of Examination etc.) of M.Sc. (Respiratory Therapy) course (*As per Annexure-1*)
2. **Amendment to Appendix II to Ordinance V (2) & VII. [E.C Res. No. 18-1-16 dated 18.08.2022]** regarding partial amendments in the BDS Ordinance in light of amendment made by Dental Council of India, in the BDS Course Regulations-2007 published in Gazette of India dated 23.05.2015 as follows:

<b>Existing</b>					<b>Amendment</b>				
<b>Clause 4</b>					<b>Clause 4</b>				
<b>Subjects of Study:-</b>					<b>Subjects of Study:-</b>				
<b>Final Year BDS</b>					<b>Fourth Year BDS</b>				
<b>Minimum working hours for each subject of study (BDS Course)</b>					<b>Minimum working hours for each subject of study (BDS Course)</b>				
<b>3<sup>rd</sup> BDS</b>					<b>3<sup>rd</sup> BDS</b>				
Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours	Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Medicine	60		90	150	General Medicine	60		90	150
General Surgery	60		90	150	General Surgery	60		90	150
Oral Pathology and Oral Microbiology	120	80		200	Oral Pathology and Oral Microbiology	120	80		200
Oral Medicine and Radiology	20		70	90	Oral Medicine and Radiology	20		70	90
Paediatric and Preventive Dentistry	20		70	90	Paediatric and Preventive Dentistry	20		70	90
Orthodontics & Dentofacial Orthopaedics	20		70	90	Orthodontics & Dentofacial Orthopaedics	20		70	90
Periodontology	30		70	100	Periodontology	30		70	100
Oral & Maxillofacial Surgery	20		70	90	Oral & Maxillofacial Surgery	20		70	90
Conservative Dentistry & Endodontics	30		70	100	Conservative Dentistry & Endodontics	30		70	100
Prosthodontics and Crown & Bridge	30		70	100	Prosthodontics and Crown & Bridge	30		70	100
<b>Total</b>	<b>410</b>		<b>750</b>	<b>1160</b>	<b>Total</b>	<b>410</b>	<b>80</b>	<b>670</b>	<b>1160</b>

<p><b>Clause 8.1</b> Any student who does not clear the first BDS university examination in all subjects within 3 years from the date of admission, shall be discharged from the course.</p>	<p><b>Clause 8.1</b> Any student who does not clear the BDS Course in all the subjects within a period of <b>9 years</b>, including one year Compulsory Rotatory paid Internship from the date of admission shall be discharged from the course.</p>																																																		
<p>Clause 8.III (Below III BDS Examination) <b>Final BDS Examination</b></p>	<p>Clause 8.III <b>Fourth BDS Examination</b></p>																																																		
<p>Clause 11 (i) Practical and Clinical Evaluation will also Objective Structured Clinical Evaluation and Viva-voce.</p>	<p>Clause 11 (i) Practical and Clinical Evaluation will also Objective Structured Clinical Evaluation and Viva-voce.</p>																																																		
<p><b>Clause 12</b> <b>Marks distribution in each subject:</b> Each subject shall have a maximum of 200 marks. <b>Theory</b> 100 <b>Practical/Clinical and viva</b> 100</p> <table border="1"> <tr><td><b>Theory</b></td><td><b>100</b></td></tr> <tr><td>University written examination</td><td>90</td></tr> <tr><td>Internal Assessment (Written)</td><td>10</td></tr> <tr><td><b>Total</b></td><td><b>100</b></td></tr> </table> <table border="1"> <tr><td><b>Practical/Clinical and Viva</b></td><td><b>100</b></td></tr> <tr><td>University Examination</td><td>90</td></tr> <tr><td>Internal Assessment (Practical/ Clinical)</td><td>10</td></tr> <tr><td><b>Total</b></td><td><b>100</b></td></tr> </table> <p><b>Practical/Clinical and Viva Voce only in II BDS University Examination of the following subjects:-</b> (i) Pre-clinical Prosthodontics (ii) Pre- clinical conservative Dentistry</p> <table border="1"> <tr><td>Internal Assessment</td><td>10</td></tr> <tr><td>Practical</td><td>70</td></tr> <tr><td>Viva Voce</td><td>20</td></tr> <tr><td><b>Total</b></td><td><b>100</b></td></tr> </table>	<b>Theory</b>	<b>100</b>	University written examination	90	Internal Assessment (Written)	10	<b>Total</b>	<b>100</b>	<b>Practical/Clinical and Viva</b>	<b>100</b>	University Examination	90	Internal Assessment (Practical/ Clinical)	10	<b>Total</b>	<b>100</b>	Internal Assessment	10	Practical	70	Viva Voce	20	<b>Total</b>	<b>100</b>	<p><b>Clause 12</b> Each subject shall have a maximum of 200 marks. <b>Theory</b> 100 <b>Practical/Clinical</b> 100</p> <table border="1"> <tr><td><b>Theory</b></td><td><b>100</b></td></tr> <tr><td>University written examination</td><td>70</td></tr> <tr><td>Viva Voce</td><td>20</td></tr> <tr><td>Internal Assessment (Written)</td><td>10</td></tr> <tr><td><b>Total</b></td><td><b>100</b></td></tr> </table> <table border="1"> <tr><td><b>Practical/Clinical and Viva</b></td><td><b>100</b></td></tr> <tr><td>University Examination</td><td>90</td></tr> <tr><td>Internal Assessment (Written)</td><td>10</td></tr> <tr><td><b>Total</b></td><td><b>100</b></td></tr> </table> <p><b>Practical and Viva Voce only in University Examination:</b> (i) Pre-clinical Prosthodontics (ii) Pre- clinical conservative Dentistry</p> <table border="1"> <tr><td>Internal Assessment</td><td>20</td></tr> <tr><td>Practical</td><td>60</td></tr> <tr><td>Viva Voce</td><td>20</td></tr> <tr><td><b>Total</b></td><td><b>100</b></td></tr> </table>	<b>Theory</b>	<b>100</b>	University written examination	70	Viva Voce	20	Internal Assessment (Written)	10	<b>Total</b>	<b>100</b>	<b>Practical/Clinical and Viva</b>	<b>100</b>	University Examination	90	Internal Assessment (Written)	10	<b>Total</b>	<b>100</b>	Internal Assessment	20	Practical	60	Viva Voce	20	<b>Total</b>	<b>100</b>
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<p>Clause 14 Syllabus:- As per Annexure-II</p>	<p>Clause 14 Syllabus:- As per DCI Norms</p>																																																		

3. Amendment to Appendix II to Ordinance V (2) & VII. [E.C Res. No. 18-1-17 dated 18.08.2022] regarding course curriculum for MD course in Physical Medicine and Rehabilitation (PMR). (As per Annexure-II)
4. Amendment to Appendix II to Ordinance V (2) & VII. [E.C Res. No. 30-3/ dated 18.08.2022] regarding partial amendments in the MDS Ordinances to change the nomenclature of the Post Graduate Course (MDS) and the changes made in the nomenclature of theory exam papers of MDS Course in the light of Regulations of the Dental Council of India, published in the Gazette of India dated 05.11.2017 as follows :

Paper No./ Clause No.	EXISTING	AMENDED
	Nomenclature as per Clause 6 in MDS Ordinance 2019	Change required in Clause 6 and other corresponding clauses in MDS Ordinance 2019
	Paedodontics and Preventive Dentistry	Pediatric and Preventive Dentistry
	Oral Pathology & Microbiology	Oral & Maxillofacial Pathology and Oral Microbiology
<b>Specialty/Department :- Prosthodontics and Crown &amp; Bridge</b>		
<b>(Part-II) Paper No.</b>	<b>Existing name as per Clause 17.1 of MDS Ordinance 2019</b>	<b>Change required in Clause 17.1 and other corresponding clauses.</b>
Paper-I	Removable Prosthodontics and Oral Implantology	Removable Prosthodontics and Implant supported prosthesis (Implantology), Geriatric dentistry and Cranio facial Prosthodontics
Paper-II	Fixed Prosthodontics	Fixed Prosthodontics, Occlusion, TMJ and Esthetics
Paper-III	Essay	Descriptive and analyzing type question
<b>Specialty/Department :- Periodontology</b>		
Paper-I	Etiopathogenesis	Normal Periodontal structure, Etiology and Pathogenesis of Periodontal disease, epidemiology as related to Periodontics
Paper-II	Clinical Periodontology	Periodontal diagnosis, therapy and Oral Implantology
Paper-III	Essay	Descriptive and analyzing type question

<b>Specialty/Department :- Oral &amp; Maxillofacial Surgery</b>		
Paper-I	Minor Oral Surgery and Trauma	No Change
Paper-II	Maxillofacial Surgery and Oral Implantology	Maxillofacial Surgery
Paper-III	Essay	Descriptive and analyzing type question
<b>Specialty/Department :- Conservative Dentistry and Endodontics</b>		
Paper-I	Conservative Dentistry & Aesthetic Dentistry	Conservative Dentistry
Paper-II	Endodontics	No Change
Paper-III	Essay	Descriptive and analyzing type question
<b>Specialty/Department :- Orthodontics and Dentofacial Orthopedics</b>		
Paper-I	Diagnosis and treatment planning	Orthodontic history, Concepts of occlusion and esthetics, Child and Adult Psychology, Etiology and classification of malocclusion, Dentofacial Anomalies, Diagnostic Procedures and treatment planning in Orthodontics, Practice management in Orthodontics
Paper-II	Clinical Orthodontics and Mechanotherapy	Clinical Orthodontics
Paper-III	Essay	Descriptive and analyzing type question
<b>Specialty/Department :- Oral and Maxillofacial Pathology and Oral Microbiology</b>		
Paper-I	Oral Pathology, Microbiology and Oncology Immunology and Forensic Odontology	Oral Pathology, Oral Microbiology and Immunology and Forensic Odontology
Paper-II	Laboratory Techniques and Diagnosis	Laboratory Techniques and Diagnosis and Oral Oncology
Paper-III	Essay	Descriptive and analyzing type question
<b>Specialty/Department :- Public Health Dentistry</b>		
Paper-I	Public Health	No Change
Paper-II	Dental Public Health	No Change
Paper-III	Essay	Descriptive and analyzing type question

<b>Specialty/Department :- Pediatric and Preventive Dentistry</b>		
Paper-I	Clinical Pediatric Dentistry	Clinical Pedodontics
Paper-II	Preventive and Community Dentistry as applied to pediatric dentistry	No Change
Paper-III	Essay	Descriptive and analyzing type question
<b>Specialty/Department :- Oral Medicine and Radiology</b>		
Paper-I	Diagnosis, diagnostic methods and Imageology and Applied Oral Pathology	Oral and Maxillofacial Radiology
Paper-II	Oral Medicine, therapeutics and laboratory investigations	No Change
Paper-III	Essay	Descriptive and analyzing type question

*Muehl*  
10/1/13  
**REGISTRAR**

**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
Total Rs.		16,100.00

\*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.

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## **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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<b>SEMESTER III</b>		
	<b>Subject</b>	<b>Marks</b>
<b>Paper I</b>	<b>Advance Physiology &amp; Applied to Respiratory Care</b> - Pathophysiology of acute respiratory failure - Acid base and electrolyte imbalance	100
<b>Paper II</b>	<b>Oxygen &amp; Aerosol Therapy</b> - Oxygen therapy - Oxygen delivery devices - Aerosol dynamics - Aerosol Theory	100
<b>Paper III</b>	<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>

<b>SEMESTER IV</b>		
	<b>Subject</b>	<b>Marks</b>
<b>Paper I</b>	<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
<b>Paper II</b>	<b>Procedures &amp; Practices of Respiratory Care I</b> - Suctioning techniques - Basic and advanced cardiac life support - Airway management techniques	100
<b>Paper III</b>	<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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**GUIDELINES FOR COMPETENCY BASED  
POSTGRADUATE TRAINING PROGRAMME FOR MD IN  
PHYSICAL MEDICINE AND REHABILITATION (PMR)  
FOR UNIVERSITY OF DELHI**


**Preamble:**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The goal of this program is to standardize Physical Medicine and Rehabilitation (PMR) teaching at the Post Graduate level throughout the so that it will benefit in achieving uniformity in postgraduate medical education.

Physical Medicine and Rehabilitation (PMR), also called physiatry, (pronounced fizza at tree), or physical and rehabilitation medicine emphasizes the prevention, diagnosis and treatment of disorders, particularly those of the neuro-musculo-skeletal, cardiovascular, and pulmonary systems, that may produce temporary or permanent activity limitation, disability, or participation restriction. Physical Medicine and Rehabilitation is an independent clinical discipline. PMR has a vast scope as it provides integrated comprehensive care in the diagnosis, treatment and rehabilitation management of neurological, musculo-skeletal, cardio-pulmonary disabilities from acquired or congenital conditions presenting at any stage in life from pediatric to geriatric phases. This specialty focuses on the restoration of function of people to the highest possible level, through a multi-disciplinary team approach, making use of diagnostic and therapeutic armamentarium including education and counseling, prescription of medicines, therapeutic exercises, equipment (mobility aids, orthotic-prosthetic appliances, assistive technology, physical agents and modalities, etc.), injections, surgical interventions for correction of deformities etc. in an institution-based (out-door and in-door/wards/ICUs/Nursing Homes/Old-Age Homes etc.), out-reach (Camps, Mobile Units), or community-based settings (CBR), based on the evaluation of the individual under consideration. It is also involved in disability prevention, evaluation and certification, besides development, monitoring and supervision of a rehabilitation plan and conducting research and development.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

  
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## **PROGRAMME OBJECTIVES**

The overall objective is to impart a thorough and comprehensive training to a medical graduate so that at the end of this training he/she becomes a knowledgeable, skilled, and competent Physical Medicine and Rehabilitation specialist, capable of discharging his/her duties as expected under different settings, in an ethical manner.

The student should be able to suspect, investigate, diagnose, confirm, evaluate, certify, treat, and rehabilitate if and when a person is suffering from a temporary or permanent limitation in function, disability, or restriction in participation; the student should be able to plan, prescribe, supervise and lead the execution of rehabilitation plan through an integrated, multi-disciplinary team involving various medical, nursing, allied health professionals such as therapists (occupational therapists, physiotherapists, speech therapists etc.), counselors, and technicians (orthotic-prosthetic engineers/ technicians). The student should be able to interpret reports and plan research, teach medical and paramedical personnel, educate

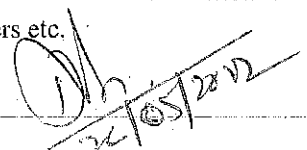
- 1) The person with disability,
- 2) Their family,
- 3) Rehabilitation team members and
- 4) The community.

The student should be well versed with recent advances in the field, and with administrative, financial, ethical and legal aspects related to the specialty.

## **SUBJECT SPECIFIC LEARNING OBJECTIVES**

The post graduate student, on completion of the MD training in Physical Medicine and Rehabilitation, should be able to demonstrate the following:

1. **Theoretical knowledge:** The student should be able to demonstrate possession of basic knowledge of
  - a) Basic medical sciences - Anatomy, Biomechanics, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, Medical Genetics and Molecular Biology etc. as related to Physical Medicine and Rehabilitation,
  - b) Factors which may disturb structure or function and result in disability;
  - c) Bed-side procedures (diagnostic and therapeutic).
2. **Teaching-Training:** The student should be:
  - a) Able to plan educational programs in Rehabilitation Medicine in association with his senior colleagues/Faculty,
  - b) Familiar with the modern methods of teaching and evaluation;
  - c) Teach and/or deliver lectures to medical students, residents, other health professionals
  - d) Able to counsel persons with disabilities and their family members etc. and hold clinical demonstrations for them;

  
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discuss it; methodically summarize the same and get it published, according to prescribed instructions and

f) Critically evaluate and discuss published articles on the subject.

3. **Clinical/Practical skills:** The student should understand and develop competence in

- a) Executing common general procedures employed in diagnosis, investigations and management of conditions encountered in rehabilitation medicine.
- b) He/she should be able to practice and handle independently most of the day to day problems as encountered in Rehabilitation Medicine in a safe, effective and ethical manner.
- c) He/she should be able to plan a comprehensive rehabilitation service independently.
- d) He/she should be able to demonstrate understanding of the fabrication and competence in prescription and check out of orthoses and prostheses, the principles, prescription and supervision of physiotherapy, occupational therapy, psycho-socio-vocational counseling.
- e) He/she should be able to practice rehabilitation medicine at the door step of community.
- f) He/she should be familiar with the common problems occurring in the urban, semi-urban, and rural areas and deal with them effectively.
- g) He should be able to organize, conduct, and supervise surveys in rural, urban and industrial communities and in specified groups of population;
- h) He should be able to organize and conduct camps for disability prevention and rehabilitation of disabled persons, and guide rehabilitation workers at the peripheral level for rehabilitation of persons with disabilities.

4. **Research:** The student should be able to

- a) Recognize and understand a research topic,
- b) State the objectives in terms of what is expected to be achieved in the end,
- c) Plan a rational approach with full awareness of the statistical validity,
- d) Spell out the methodology and carry out most of the technical procedures required for the study,
- e) Accurately and objectively record on systematic lines the results and observations made, analyze the data using appropriate statistical approach,
- f) Interpret the observations in light of existing knowledge and highlight in what ways the study has advanced existing knowledge on the subject and what remains to be done, draw conclusions which should be reached by logical deduction and he should be able to assess evidence both as to its reliability and its relevance,
- g) Write a thesis in accordance with the prescribed instructions, and
- h) Be familiar with ethical aspects of research etc.


  
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## ***SUBJECT SPECIFIC COMPETENCIES***

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

### **A. Cognitive domain:**

1. Acquire basic knowledge of basic medical sciences such as Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, and Molecular Biology etc. as related to Physical Medicine and Rehabilitation
2. Acquire knowledge on factors which may result in disability
3. Acquire knowledge of basic anatomy and physiology of the musculoskeletal (including Biomechanics), urogenital, cardio-pulmonary and nervous systems
4. Acquire knowledge of basic principles of diagnostic modalities as applied to Physical Medicine and Rehabilitation.
5. Understand philosophy, history, scope and need of Physical Medicine and Rehabilitation.
6. Acquire knowledge of basic concepts in Physical Medicine and Rehabilitation - definitions, rehabilitation team, team members, scope, role and responsibilities of different members.
7. Acquire knowledge of principles of evaluation and rehabilitation management of social problems
8. Acquire knowledge of principles of evaluation and rehabilitation management of vocational problems
9. Understand disability prevention & management- levels and examples
10. Understand epidemiology of disability
11. Understand the outcome measures in Physical Medicine and Rehabilitation
12. Impairment Rating and Disability Evaluation
13. Acquire knowledge of integrative Medicine and Physical Medicine and Rehabilitation
14. Understand Assistive Technology related to Physical Medicine and Rehabilitation
15. Acquire knowledge of basic principles of rehabilitative surgeries
16. Acquire knowledge of Pediatric Rehabilitation including children with Autism Spectrum Disorders, Cerebral Palsy, learning disabilities, multiple disabilities etc.
17. Acquire knowledge of Geriatric Rehabilitation
18. Acquire knowledge of Evidence-based Medicine and Physical Medicine and Rehabilitation
19. Understand Legislation in relations to disability- National and International

  
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1. 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.
2. 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.
3. 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**

**At the end of the course, the student should acquire the following clinical/practical skills:**

#### **Section A:**

1. Evaluation Process:
  - History taking in Physical Medicine and Rehabilitation
  - Clinical evaluation, Manual Muscle Strength Testing, Joint Range of Motion, Goniometry, Activities of Daily Living
  - Investigations - Laboratory and Radiological imaging studies including X-Rays, CT Scan, MRI, diagnostic musculoskeletal ultrasound, DEXA Scan etc.
  - Evaluation of neurogenic bowel and bladder dysfunction
2. Gait Analysis - Terminology, types, Clinical Applications
3. Electrodiagnostic Medicine - basic principles, clinical methods, interpretation etc.
4. Outcome Measures in Physical Medicine and Rehabilitation
5. Impairment Rating, Disability Evaluation and Certification

#### **Section B:**

6. Therapeutic Exercises- settings, equipments, applications
7. Physical Agents/Modalities - precautions, prescription, application, follow-up, contraindications etc.
8. Traction, Massage - principles, types, indications, contra-indications, precautions, prescription, application, follow-up etc.
9. Electrical Stimulation - precautions, prescription, application, follow-up etc.
10. Principles and practice of Occupational Therapy
11. Training of A.D.L. (Activities of Daily Living) in various conditions
12. Injection Techniques (c.g. intra-articular, peri-articular, trigger-point, epidural etc.) in Physical Medicine and Rehabilitation

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toxin injection, Phenol block, Alcohol blocks etc.

14. Upper limb orthotic devices including splints- applications
15. Lower limb orthotic devices including footwear modifications- applications
16. Spinal orthoses - applications
17. Upper limb prosthetics and amputee rehabilitation
18. Lower limb prosthetics and amputee rehabilitation
19. Mobility aids, wheelchairs and seating systems
20. Low back pain and Physical Medicine and Rehabilitation
21. Musculoskeletal trauma and Physical Medicine and Rehabilitation
22. Rehabilitation of persons suffering from:
  - Arthritis including Rheumatoid Arthritis, Osteoarthritis, Ankylosing Spondylitis etc.
  - Spinal deformity
  - Neck Pain, Shoulder Pain etc.
  - Osteoporosis
  - Sports Injury
  - Burns Injury
  - Spinal Cord Injury
23. Rehabilitation of persons:
  - with obesity, dyslipidemia etc.
  - after Arthroplasty
  - after POP cast, Fracture treatment, Surgical intervention
24. Basic principles and practice of interventions and rehabilitative surgeries such as deformity correction in poliomyelitis, cerebral palsy, clubfoot, contractures, revision of amputation stump, closure of pressure sore, tendon transfers etc.

### Section C:

25. Rehabilitation of persons suffering from:
  - Plexus or Nerve Injury
  - Traumatic Brain Injury
  - Stroke
  - Parkinsonism, Multiple sclerosis, Ataxia, neurodegenerative disorders etc.
  - Neuropathy, Bell's Palsy etc.
  - Hansen's Disease (Leprosy including leprosy-cured persons)
  - diseases of Muscles e.g. myopathy, motor-neuron disease, myasthenia gravis etc.
  - Cerebral Palsy
  - Spasticity, dystonia, rigidity,
  - Poliomyelitis and its sequelae including Post-polio syndrome
  - Cardiovascular Disease e.g. CAD, MI, CABG Surgery, Angioplasty, Heart failure, Cardiac transplantation etc.
  - Pulmonary Disease e.g. COPD, Bronchiectasis, Cystic fibrosis etc.

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- Cancer
- Patients in the ICU setting
- Swallowing disorder
- Bladder dysfunction
- Bowel dysfunction
- Vertigo
- HIV/AIDS
- Chronic Pain
- Organ Transplantation

26. Pediatric Rehabilitation including children with Cerebral palsy, muscular dystrophy, Autism Spectrum Disorders, learning disabilities, neural-tube defects, multiple disabilities etc.
27. Geriatric Rehabilitation
28. Principles of evaluation and rehabilitation management of persons with:
  - visual impairment
  - Intellectual disability
  - hearing /speech impairment
  - psychological problems or mental illness
29. Medical/ surgical Emergencies in Physical Medicine and Rehabilitation
30. Sexuality and Disability

**Section D:**

31. Evidence-based Medicine and Physical Medicine and Rehabilitation
32. Legislation in relations to disability- National and International
33. Schemes and Benefits extended to persons with disabilities by the Govt.
34. Barrier-free Environment and access related issues
35. Computers in Physical Medicine and Rehabilitation
36. Assistive-technologies in rehabilitation
37. Ethical aspects in disability and rehabilitation
38. Recent Advances related to Physical Medicine and Rehabilitation

***Syllabus***

**Course Contents**

The course contents for MD (Physical Medicine and Rehabilitation) is divided into four broad sections, covering four theory papers. However, certain degree of overlapping may occur among different sections. The content would include the following:

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**Section A:**

- 1) Basic Anatomy and Physiology of the Musculoskeletal (including Biomechanics), Urogenital, Cardio-pulmonary and nervous systems, etc.
- 2) Basics of biochemical aspects of Calcium and Vit. D metabolism, osteoporosis, diabetes mellitus etc.
- 3) Basic Pathological processes causing diseases and disabilities, healing etc.
- 4) Basic principles of Pharmacology as applied to the conditions encountered in Physical Medicine and Rehabilitation.
- 5) Basic principles of diagnostic modalities as applied to Physical Medicine and Rehabilitation.
- 6) Philosophy, history, scope and need of Physical Medicine and Rehabilitation.
- 7) Basic concepts in Physical Medicine and Rehabilitation - definitions, rehabilitation team, team members, scope, role and responsibilities of different members etc.
- 8) Principles of evaluation and rehabilitation management of social problems
- 9) Principles of evaluation and rehabilitation management of vocational problems
- 10) Organisation and Administration of Physical Medicine and Rehabilitation Services.
- 11) Disability process. Impairment, disability, International Classifications
- 12) Disability Prevention- levels and examples
- 13) Epidemiology of disability, magnitude, causes, changing trends etc.
- 14) Gait Analysis - Terminology, types, Clinical Applications
- 15) Electrodiagnostic Medicine - basic principles, clinical methods, interpretation etc.
- 16) Outcome Measures in Physical Medicine and Rehabilitation
- 17) Impairment Rating and Disability Evaluation

**Section B:**

- 18) Therapeutic exercises - principles, types, indications, contraindications
- 19) Physical agents/modalities - principles, types, indications, contra-indications, precautions.
- 20) Manipulation, traction, massage - principles, types, indications, contra-indications, precautions.
- 21) Electrical stimulation - principles, types, indications, contra-indications, precautions.
- 22) Principles and scope of Occupational Therapy
- 23) Rationale of A.D.L. (Activities of Daily Living) in various conditions
- 24) Integrative Medicine and Physical Medicine and Rehabilitation

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- 25) Upper limb orthotic devices including splints– principles, types, materials and indications,
- 26) Lower limb orthotic devices including footwear modifications– principles, types, materials and indications
- 27) Spinal orthoses – principles, types, materials and indications
- 28) Upper limb prosthetics and amputee rehabilitation,
- 29) Lower limb prosthetics and amputee rehabilitation
- 30) Mobility aids, wheelchairs and seating systems,
- 31) Low back pain and Physical Medicine and Rehabilitation
- 32) Musculoskeletal trauma and Physical Medicine and Rehabilitation
- 33) Holistic Rehabilitation of persons suffering from:

- Arthritis, including Rheumatoid Arthritis, Osteoarthritis, Ankylosing Spondylitis etc.
- Spinal deformity
- Neck Pain, Shoulder Pain etc.
- Osteoporosis
- Sports Injury
- Burns Injury
- Spinal Cord Injury (traumatic and non-traumatic)

- 34) Rehabilitation of persons:
  - with obesity, dyslipidemia etc.
  - after Arthroplasty
  - after POP cast, Fracture treatment, Surgical intervention

- 35) Principles of Sports Medicine, diagnosis, evaluation, prevention, and management of sports injuries

- 36) Basic principles of rehabilitative surgeries such as deformity correction in poliomyelitis, cerebral palsy, clubfoot, contractures, revision of amputation stump, closure of pressure sore, tendon transfers etc.

**Section C:**

- 37) Holistic Rehabilitation of persons suffering from:

- Plexus or Nerve Injury
- Traumatic Brain Injury
- Stroke
- Parkinsonism, Multiple sclerosis, Ataxia, neurodegenerative disorders etc.
- Neuropathy, Bell's Palsy etc.
- Hansen's Disease

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- Diseases of Muscles e.g. myopathy, motor-neuron disease, myasthenia gravis etc.
  - Cerebral Palsy
  - Spasticity
  - Poliomyelitis and its sequelae
  - Cardiovascular Disease e.g. CAD, MI, CABG Surgery, Angioplasty, Cardiac transplantation etc.
  - Pulmonary Disease e.g. COPD, Bronchiectasis, Cystic fibrosis etc.
  - Cancer
  - Swallowing disorder
  - Bladder dysfunction
  - Bowel dysfunction
  - Vertigo
  - HIV/AIDS
  - Chronic Pain
  - Neural tube defects like meningomyelocele and hydrocephalus etc.
- 38) Rehabilitation of persons:
- after Organ Transplantation
  - in ICU setting
- 39) Pediatric Rehabilitation including children with Autism Spectrum Disorders, learning disabilities, multiple disabilities etc.
- 40) Geriatric Rehabilitation
- 41) Principles of evaluation and rehabilitation management of persons with:
- visual impairment
  - Intellectual disability
  - hearing /speech impairment
  - psychological problems or mental illness
- 42) Medical/ surgical Emergencies in Physical Medicine and Rehabilitation
- 43) Sexuality and Disability

**Section D:**

- 44) Evidence-based Medicine and Physical Medicine and Rehabilitation
- 45) Legislation in relations to disability- National and International
- 46) Functional evaluation, Impairment rating, disability evaluation and certification including guidelines for these

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- 47) Schemes and Benefits extended to persons with disabilities by the Govt.
- 48) Barrier-free Environment and access related issues
- 49) Computers in Physical Medicine and Rehabilitation
- 50) Assistive Technology related to Physical Medicine and Rehabilitation
- 51) Recent Advances related to Physical Medicine and Rehabilitation
- 52) Ethical aspects in rehabilitation
- 53) Research methodology

## **TEACHING AND LEARNING METHODS**

### **Post-Graduate Training:**

#### **A. Theoretical Methodology:**

##### **1. Symposia/Seminars:**

The post graduate student would be required to present topics to the combined group of teachers and students. A free discussion would be encouraged in these activities. The topics of the symposia/seminars would be given to the residents with the dates for presentation.

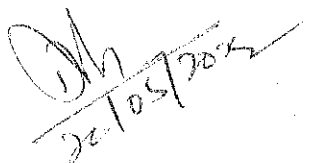
The topics for Seminars could include any of the following: Gait Analysis, Spasticity, Pressure Sores, Spinal Orthoses, Hand Splints, Assistive Technology, Psycho-Social-Vocational Aspects, Cardiac Rehabilitation, Pulmonary Rehabilitation, Neuro-developmental Techniques, Post-Polio Syndrome, Cognitive Rehabilitation, Prosthetic Feet, PTB Prosthetic, Prosthetic Terminal Devices, CAD-CAM, FES, Spinal Deformities, Rehabilitation after Arthroplasty, Epidemiology of Disability, Barrier-free Environment, Ethical Aspects, Legislation related to Disability and Rehabilitation, Community-Based Rehabilitation, Leprosy Rehabilitation, Sexuality and Disability, Rehabilitation related to HIV/AIDS, Stem Cell Therapy in Rehabilitation, Geriatric Rehabilitation, Sports Injuries Rehabilitation, Rehabilitation after Organ Transplantation, Pain Management, Analgesics, NSAIDs, DMARDs, Disability Evaluation, Interventions in Physical Medicine and Rehabilitation etc.

##### **2. Journal Club:**

This should be a regular/weekly activity. The post graduate student would be assigned /allowed to chose an article from amongst the recent publications from the list of recommended journals, present, summarise, and discuss the published article critically. The contributions made by the article in furtherance of the scientific knowledge as well as limitations (if any) should be highlighted.

##### **3. Practical and Clinical Training:**

###### **Clinical:**

  
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of history taking and examination in rehabilitation practice. During this period, the student would also be oriented to the common problems that present in the OPD or Wards/ICUs or are encountered in the community. The student would be supervised by Senior Residents and Faculty members.

**Bedside:**

The student would work up cases; learn management of cases by discussion with the senior residents and faculty of the department. She/he would be trained in management of in-patients including performing certain procedures such as debridement, Plaster cast application, traction, catheterization, intubation etc.


**Rehabilitative Interventions and Surgery:**

The student would be provided with an opportunity, as far as possible, to observe, learn, assist and once proficient, perform rehabilitative surgical operations such as for correction of deformities in polio, cerebral palsy, amputation, clubfoot, pressure sore etc. including post-operative care with the assistance of the Senior Residents and/or under the direct supervision of a Faculty member.

The student would also be oriented to the various sections/units in a comprehensive rehabilitation set up (such as occupational therapy, orthotics-prosthetics, physiotherapy, social works, clinical psychology, vocational guidance/counseling, educational institution and Non-Governmental Organization in the disability sector etc.) and be well informed about and demonstrated the various equipments/materials/methods used there, and the scope, role and responsibilities of different members of a rehabilitation team.

**4. Training in Research Methodology**

- The student would carry out the research project and write a thesis. Thesis topic would be finalized by the student in consultation with the Guide and Co-Guides, as per the norms duly approved by the Ethics Committee of the Institution. He would also be given exposure to partake in the research projects going on to learn their planning, methodology and execution to learn various aspects of research.
- The student would be given exposure to partake in the research projects going on to learn their planning, methodology and execution to learn various aspects of research.

  
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**5. Teaching Skills**

The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

**6. Continuing Medical Education Programmes (CME)**

At least two CME programmes should be attended by each student in 3 years.

**7. Conferences**

The student should attend courses, conferences and seminars relevant to the speciality.

**8. Case presentation, case work up, case handling/management (once a week)**

**9. Attending clinical grand rounds / clinic-pathological conference**

The post graduate students are encouraged to attend lectures and grand rounds of other clinical and basic science departments of the hospital.

**10. Paper/poster presentation:**

A post graduate student of a post graduate 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.

**11. Teaching skills:**

The post graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.


**12. A logbook should be maintained recording the duration of posting, the period of absence, if any, skills performed, and remarks if any by the teacher/faculty member.**

The logbook should also record journal clubs, seminars attended and partaken as well as undergraduate teaching activities the post graduate student has participated and should be signed by the faculty in charge.

**13. Department should encourage e-learning activities.**

**14. Rotation Posting:** During the tenure of 3 years training, the candidate would be posted on rotation for 03 months in the 3<sup>rd</sup> year for 15 days each in department of Orthopedics, Neurology, Pulmonary/ Respiratory Medicine, Intensive Care Unit, pain & palliative care & spinal injury ward in the same institution or other institutions in Delhi. The duration of posting in different departments will be 15 days as per availability of different services and mutual agreement between heads of the departments/ institutions.

**During the training programme, patient safety is of paramount importance, therefore skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.**

  
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## ASSESSMENT

### **FORMATIVE ASSESSMENT i.e., assessment during the 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.**

**Quarterly assessment during the MD training should be based on:**

- Journal based / recent advances learning
- Patient based /Laboratory or Skill based learning
- Self directed learning and teaching
- Departmental and interdepartmental learning activity
- External and Outreach Activities / CMEs

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

### **SUMMATIVE ASSESSMENT, i.e., at the end of training**

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in three parts:

#### **1. Thesis**

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:**

There shall be four papers each of three hours duration. Each paper shall consist of two long essay questions, three short essay questions and four short notes. These are:

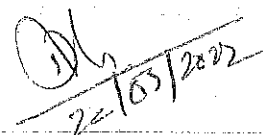
<b>Paper I:</b>	Basic Sciences and Basic Concepts as applied to Physical Medicine and Rehabilitation
<b>Paper II:</b>	Principles and Practice of Physical Medicine; and Rehabilitation Management of Musculoskeletal Conditions
<b>Paper III:</b>	Principles and Practice of Rehabilitation Management of Neurological, Cardio-pulmonary and other Conditions
<b>Paper IV:</b>	Legislation, Recent Advances as applied to Physical Medicine and Rehabilitation

#### **3. Clinical / Practical and viva voce Examination**

The emphasis would be on the Objective Structured Clinical Examination (OSCE).

Practical examination would be conducted as per following:

- Long Case - One
- Short Cases - Three

  
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involving

PMR related X-Ray/CT Scan/MRI /Bone Scan Films Rehabilitation Surgery

Instruments

Physical Medicine Instruments/Equipments/Modalities

### **Orthotic-Prosthetic Appliances**

### **OSCE Based Examination Scheme for MD (PMR) Examinations**

**Oral/Viva voce examination** shall be in the following areas:

#### **Item**

- i. PMR related X-rays, US Scan, CT Scan, MRI, EMG/NCV reports etc.
- ii. PMR related Surgical Instruments
- iii. Prosthetic and Orthotic devices
- iv. Physical Medicine Instruments/Equipments

Please see **Annexure 1** for pattern of marking for practical examinations.

#### **Recommended Reading**

The list is indicative only, and not exhaustive.

#### **Books (latest edition)**

1. Braddom RL. Physical Medicine and Rehabilitation, Saunders
2. DeLisa JA. Rehabilitation Medicine: Principles and Practice. Lippincott
3. Rusk HA. Rehabilitation Medicine. CV Mosby
4. Helander E, Mendis P, Nelson G, Goerd A. Training in the Community for People with Disabilities WHO, Geneva.
5. Helander E. Prejudice and Dignity - An Introduction to Community-Based Rehabilitation. UNDP.
6. Solomon L. Apley's System of Orthopaedics and Fractures. Arnold London
7. Fauci, Braunwald, Kasper, Hauser et al. Harrison's Principles of Internal Medicine McGraw-Hill Company
8. Steven Kirshblum, Denise I Campagnolo. Spinal Cord Medicine, Lippincott Williams & Wilkins.
9. Vernon W Lin. Spinal Cord Medicine - Principles and Practice. Demos

#### **Journals**

**Three international and two national journals (all indexed)**

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**Postgraduate Students Appraisal Form (Suggested)  
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.	Medical Knowledge										
2.	Patient Care including documentation										
3.	Procedural/ Surgical Skills										
4.	Professionalism										
5.	Ethical Behavior										
6.	Self Directed Learning										
7.	Participation in Departmental Learning/Teaching activities										
8.	Thesis / Research work										
9.	Log Book Maintenance										
10.	Journal Club										

Participation and presentation during Conference/Workshop/CME Yes/ No

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

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