M.SC (RESPIRATORY THERAPY) DEGREE COURSE

SYLLABUS FOR I YEAR

ANATOMY:-

1. Development of the Respiratory system
2. Anatomy of the Upper & Lower Airways (Including Nasal cavity & Nasopharynx)
3. Pleura & Lungs
4. Broncho Pulmonary segments
5. Muscles and Respiration
6. Diaphragm
7. Vascular supply of Respiratory system
8. Osteology of Thorax
9. Innervation of the lungs and Pleura
10. Applied Anatomy & Functional Anatomy of Respiratory system
11. Congenital anomalies involving Thorax & Airways
12. Cardiovascular System Anatomy
13. Neonatal & Paediatric Respiratory Anatomy

PHYSIOLOGY:-

1. Post Natal Lung Development
2. Cases involved in Respiration
3. Lung volumes and Capacities, Mechanism of Respiration
4. Control of Breathing
5. Oxygen dissociation curve, diffusing of gases
6. Co2 Transport
7. O2 cascade, O2 flux
8. Arterial Blood gases
9. Arterial Blood gas Analysis

10. Pulmonary Function measurements

11. Diffusion studies

12. Whole Body Plethysmography

13. Hyperbaric oxygen

14. ECMO

15. Pulmonary Surfactant

16. Flicks Formula

17. Physiology of Sleep

18. High Altitude Physiology/ Scuba Diving Physiology

19.. Control of Respiration & Fitness for Airtravel

20. Obesity causes & Complications

21. Cardio Pulmoary Resuscitation

22. Assisted Ventilation Strategies - Invasive
Non-invasive

23. Polysomnography

24. Larynx functions

25. Sleep Related Breathing Disorders

26. Cardiac cycles

27. Vascular Haemodynamics

28. Cardiac conduction systemic

29. Rhythm disturbing abnormalities

30. Haemodynamics

31. Neonatal & Paediatric Respiratory Physiology

References Books :

Williams PL, Warwick R, Dyson M, Bannister LH (eds) Grey's Anatomy. 36th edition, Churchill Living stone, Newtork, 1980.

B.D Chaurasia's, Human anatomy Regional and applied Volume – 1,3 CBS Publishers and distributions New Delhi, 1995

Arthur C Gyton, John E, Hall, Text book of Mrdical Physiology, 9th edition W.B.sounders company U.S.A 1996.

Anil BaranSingamahapatra, Essentials of Medical Physiology, 1st edition current Books international Mumbai, 1998.

Richard s. Snell, Clinical Anatomy for Medical students, 5th edition Little, Brown and company, U.S.A 1992.

Cardiopulmonary anatomy & physiology ; Jardis/T

Atlas of Human Anatomy ; Singh/I

Anatomy and Physiology in Health and Illness ; Waugh Anne

Standard Physiology text books (Gyton / Ganong / C.C.Chatterjee /

Relevant portions in Egan's fundamentals of respiratory care)

BIOCHEMISTRY

1. Acid Base Balance, Chemistry of Respiration

2. Electrolytes, fluids

3. Respiratory) Acidosis
) Alkalosis

4. Metabolic) Acidosis
) Alkalosis

5. Carbohydrates, Proteins, Fat, Structures, Synthesis & Metabolism

6. Vitamins & Minerals

7. Antioxidants

8. Enzymes & Hormonal Functions

9. Biochemical Genetics, Inborn errors of Metabolism
10. Surfactant – Constituent & Functions

MICROBIOLOGY

1. Classification of Micro organisms

2. Eukaryotic Pathogens involving Respiratory Tract

3. Prokaryotic Pathogens involving Respiratory Tract

4. Mycobacteria and common gram negative bacteria

5. Methods of Sterilisation & Disinfection

6. Airborne Infection control

- Wards
- ICU & IRCU
- Procedure room
- Spirometry
- Cough Etiquette

7. Pathogens causing Pneumonia

8. Different types of Pneumonia

9. How to take specimens from ET Tube, FOB, Thoracoscope etc.,

10. Influenza

11. H1 N1

12. Anthrax - Bioterrorism

Reference Books:

1. Text book of Microbiology by Anantha Narayanan & Jeyaram Panickar

PATHOLOGY

1. Cellular Adaptation

2. Cell Injury

3. Cell Death

4. Causes of Cell Injury

5. Reversible & Irreversible Cell Injury

6. Examples of Cell Injury & Necrosis

7. Acute and Chronic Inflammation, General Features of Inflammation

8. Systemic Pathology – Blood vessels, Lymph nodes, Veins

9. Congenital anomalies, Obstructive Restrictive Lung diseases

10. Pleural effusion

11. Benign Lung Lesions

12. Lung Malignancies

13. Fire Accidents and Effects of Respiratory Epithelial

14. Vascular changes in Pulmonary Hypertension

15. Cardiac Pathology

- Cardiomyopathy

- Post infarction

- CAD

- Pericardial effusion Tamponade

- Diaphragm, abnormalities

- Chest wall lesion - urgent
- acquired

- Pulmonary Thrombosis

PHARMACOLOGY:-

1. Respiratory Antibiotics

2. Drugs used in the
- Upper Respiratory Tract
- Allergic rhinitis
- Aerosis

3. Adrenergic Bronchodilators

4. Anticholinergic Bronchodilators

5. Mucolytics

6. Inhalationthearpy

7. Inhaled Corticosteroids

8. Mast cell stabilising agents

9. Immunotherapy

10. Aerosolized Antibiotic Administration

11. Anti – TB drugs

12. Anti-retroviral drugs

13. Anti viral drugs

Reference Books

1. Text book of pathology by Harshmohan
2. Text book of Biochemistry by Ambika Shanmugam

EQUIPMENTS:-

1.Medical Gas Pipelines
2.Oxygen Flow meters
3.Humidifiers
4.AHU
5.Defibrillators
6.Pulse Oximeter
7.Capnography
8.ABGA
9.BP – Invasive
Non-Invasive
10.Peak Expiratory flow meter
11.AMBU
12. Spirometer
13. Artificial Airways
14. Inhalation Dences and Mask
15. Nebulizer
16. Chest Drain system
17.Ventilators
18. CPAP
19. BIPAP
20. Bronchoscope – Regid
- Flexible
21.Nasal Endoscope
22. Polysomnography
23. Tracheostomy Tubes
24. ECG
25.Suction apparatus
26. ECMO
27. Mannequins
28. Servo ventilator
29.Multipara monitor
30.Videolaryngoscope
31. FeNO
32. Venturi

SYLLABUS FOR SECOND YEAR – II

(1) Advanced Respiratory Therapy Paper –II

1.Intital Patient Assessment

2. Monitoring Airway Pressure/

Compliance Airway Pressure

3. Vital Signs – PR/BP/SPO2/ABG

4. Introduction to PEEP & CPAP and BIPAP

5. Pulmonary effects of PEEP/Auto PEEP

6. Initiating PEEP and Titration/PEEP with different Ventilator modes/Inversion ratio Ventilation

7. Assisted Ventilation – Intubation/Trachoestomy/ Airway management / Central lines

8. Ventilatory settings – Mechanical and Operational – Hazards

9. Hazards of Oxygen therapy- Neonatal/Infants/Paediatrics

- Adults

10. Infection Prevention strategies in ICU

11.Chest Physiotherapy/Maintenance of ICDs Postural Drainage

12.Emergency Trachheostomy care

13.DVT Prophyplaxis

RECOMMENDED TEXT BOOKS:

1. *Egan's fundamentals of Respiratory Care , sussan pillbean, vijay deshpande*

Paper – II – Critical Care Medicine

Initial Assessment

Triaging ABCDE of Trauma

Basic Life Support

1. Adult, Child & Infant CPR (one, two man CPR)
2. Use of Pocket mask & AMBU
3. BLS Primary Survey

4. AED Overview/Demonstration
5. FBAO (Adult, Child Infant Conscious/Unconscious

Advanced Cardiac Life Support

1. The Primary and Secondary approach to emergency Cardiac care
2. The Universal Algorithm for adult emergency Cardiac care (ECC)
3. Ventricular Fibrillation/Pulseless Ventricular Tachycardia (PEA) Algorithm
4. Asystole Treatment Algorithm
5. Bradycardia Treatment Algorithm
6. Tachycardia Treatment Algorithm
7. Hypotension/Shock/Acute Pulmonary Oedema
8. Acute Myocardial Infarction
9. Paediatric Advanced Life Support
10. The Psychological Aspects of CPR and Resuscitation
11. Ethical Aspects of Emergency cardiac care

DEFIBRILLATION

1. Importance of Defibrillation
2. Types and overview of defibrillators
3. Automated External defibrillator: importance, overview and uses of AED

CARDIAC AND CARDIOVASCULAR

1. Acute Myocardial Infarction and its ICU Management
2. ECG – Life –threatening Arrhythmias and treatment
3. Unstable angina Pectoris
4. Heart block and ICU Management Cardiac Pacemakers
5. Coronary Artery Bypass Grafting (CABG)
6. Percutaneous Angioplasty
7. Aortic valve stenosis and regurgitation

8. Mitral valve stenosis and regurgitation
9. Infective endocarditis
10. Hypertensive crisis
11. Cardiomyopathies
12. Congestive Heart failure
13. Pre and Postoperative Management of the cardiac surgery patients
14. Shock
15. Management of Low cardiac output states
16. Cardiac tamponed
17. Intra-aortic balloon pump
18. Ventricular assist device
19. Pericarditis
20. Cardiac transplantation

Thrombolytic Agents:-

Streptokinase, Urokinase, Reteplase, Alteplase

Guidelines for Intravenous Techniques

Neurological Emergencies

Renal Failures

Fluid & Electrolyte Management

RECOMMENDED TEXT BOOKS:

1. *Egan's fundamentals of Respiratory Care*
2. *Essentials of Respiratory Care - Robert Kacmarek & Steven Dimas*
3. *Washington Manual of Critical care medicine*

Paper-III –Respiratory and Cardiovascular Diseases

1.Upper Airway Diseases:-

DNS/Sinusitis/snoring/OSA/Nerve palsy/Structure/Larynochromalacia/Allergy

2.Pulmonary Diseases

1.Assessment & Classification of Pulmonary Diseases

2. Hypoventilation & Hyperventilation

3.Diffusion Defects leading to Acid Base Balance

4. Ventilation Perfusion Abnormalities

5.COPD

6. ARDS

7.Pneumonia(CAP, VAP, HAP viral A typical & Fungal Pneumonia

8.Cardiac Pulmonary Edema

9.Acute Bronchitis and Bronchiolitis

10. Intestinal Lung Disease (Etology & Types)

11. Respiratory Failure

12. Tuberculosis

13. Occupational Lung Diseases

14.Bronchiectasis

15. Lung Tumour

16. Chemical Pneumonitis

17. Pleural Effusion/Complication Pleural Effusion

18. Emphysema

19.Chest Injuries

20. Pnemothorax

21.Management of ICD

22.Neuromuscular disorders

23. Pulmonary Embolism

24.Sleep disordered Breathing

3.Cardiovascular Diseases

1.Upper Airway Diseases

- Tumour of the Heart

- Stridor/causes/Tracheostomycare

- Nephrology /ARF/CRF

Systemic Diseases

- Diabetes Mellitus

- Hypo & Hyper thyroid

- Sepsis

-Etiology/Pathophysiology/Management/Brain death

Congenital Diseases

- Anatomical abnormalities

-Obstruction

- Valvular Abnormalities

- Abnormal communication between chambers

-Abnormal connection

-Surgical treatment

Valvular Heart Diseases

-Rheumatic HD

-Artic valve

-Mitral valve

-combined Valvular

-Tricuspid and Pulmonary valve

- Cyanotic HD of Infancy

-Acyanotic Septal defects

-Pericardial effusion/Pericarditis/Pancarditis/Cardiomyopahty

-Diagnostic procedure /Factors/Tests/Supportive Ventilation

Conduction defected Arrhythmia:-

-Coronary Artery Diseases

-Pathophysiology and clinical recognition

-Silent myocardial/Ischemia/Angina

- MI – Types/location/Thrombolytic therapy

-Other tmt modalities/Surgical Management

-Cardiac Rehabilitation service

-Heart Failure Definition/Identify/causes Pathophysiology /tmt available

-Types of Vasular

- DVT & Pulmonary Embolism/ HT/PHT/IHD

Reference Books :

- George Mathew.K Medicine Prep manual 1st edition. B.I Churchill Livingstone Pvt Ltd. New delhi1995
- Scot Irwin, Jan Stephen tecklin, Cardiopulmonary Physical therapy, a guide to practice, 3rd edition, mosby, USA.
- Donna Frownfelter, Elizabeth Dean (eds) Principles and practices of cardiopulmonary physical therapy, 3rd Mosby, USA.
- Craig L, Scanlan, Egan's Fundamentals of Respiratory care, 6th edition Mosby, 1995.
- Stevansadowsky, H Ellan, A Hillegas, Essential of Cardiopulmonary physical therapy, W.B saunders company USA.
- John F Murray, Jay A Nadel, Text book of Respiratory Medicine, 2nd edition W.B saunders company USA.
- Braunwald (edr), Heart disease, A text book or cardiovascular medicine, 4th edition, W.B saunders company, USA 1992.
- Shoemaker, Ayres, Greenvik, Holbrook, Text book of critical care,

4th edition, W.B saunders company 1984

PAPER – IV – NEONATAL & PEDIATRIC RESPIRATORY CARE

Neonatal Respiratory care

1.Normal Fetal Development

2.Assessment of Fetal Growth and Development

3. Labor, Delivery and Physiological Changes Following Birth

4.Assessment of the Neonate

6. Assessment of Oxygenation and Ventilation

7. Perinatal Lung Disease and Other Problems of Permaturity Respiratory Distress Syndrome (RDS), Transient Tachypnea of New Born (TTN) causes of Persistent Perinatal Illnesses.

8. Management of the Patient – Ventilator System

Congenital Diseases

1.Congenital Diaphragmatic Hernia

2.Abdominal Wall abnormalities

Cyanotic Heart Diseases

1.Tetralogy of fallot

2. Transposition of great arteries

Acyanotic Heat Diseases

1.Ventricular septal defect

2.Atrial septal defect

3.Patent ductus arteriosus

Paediatric Respiratory Disorders

1.Sudden infant death syndrome

2.Gastroesophageal reflux diseases

3.Bronchiolitis

4.Croup

5.Epiglottitis

6.Cystic Fibrosis

Applied Paediatric Care

1.Airway Management

2.Arterial blood gas analysis (ABG)

3.Oxygen therapy, Secretion clearance techniques

4.Humidity and aerosol therapy

Ventilatory Management

1.Concepts of Mechanical Ventilation in neonate

2.Goals of mechanical ventilation

3.Indications of mechanical ventilation

4.Modes of ventilation, strategies of ventilation

5.Weaning from ventilation CPAP/HFOV/Nasal CPAP, Hi-flow nasal cannula

RECOMMENDED TEXT BOOKS:-

1.Egan's fundamentals of Respiratory care

2.Essentials of Respiratory Care – Robert Kacmarek & Steven Dimas

3.Manual of Neonatal care by cloherty

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In exercise of the powers conferred by Section 44 of the Tamil Nadu Dr. M.G.R. Medical University, Chennai Act 1987(Tamil Nadu Act 37 of 1987) the Standing Academic Board of the Tamil Nadu Dr. M.G.R. Medical University, Chennai hereby makes the following regulations:-

1. SHORT TITLE AND COMMENCEMENT:-

These regulations shall be called as **" M.Sc. RESPIRATORY THERAPY REGULATIONS "** of the Tamil Nadu Dr. MGR Medical University, Chennai.

They shall come into force from the academic year 2018-2019 onwards.
The regulations and the Syllabus framed are subject to modification by the Standing Academic board from time to time.

2. OVERALL OBJECTIVES:

1. To provide the course that enables, Graduate with updated exposure in terms of Knowledge and practice in the fields of **M.Sc. RESPIRATORY THERAPY DEGREE COURSE** especially having relevance on medical importance.
2. To enable graduates to learn in a highly productive environment that gives then the core and comprehensive skills to deal with diagnostics applied and basic research in the fields of **M.Sc. RESPIRATORY THERAPY DEGREE COURSE.**

3. ELIGIBILITY FOR ADMISSION:

The candidates who posses Degree in **B.Sc. Respiratory Therapy Degree Course** and **B.Sc. Nursing Course** are eligible to get admitted into the course of M.Sc. (Respiratory Therapy) Degree Course.

4. AGE LIMIT:

No upper age limit for Admission

5. ELIGIBILITY CERTIFICATE:

Candidates who have passed any qualifying examination as stated in (3) other than the Tamil Nadu Dr. M.G.R. Medical University shall obtain an "Eligibility Certificate" from this University by remitting the prescribed fees along with the application form and required documents before seeking admission to any one of the affiliated institutions. The application form is available in the University website: web.tnmgrmu.ac.in.

6. REGISTRATION:

A Candidate admitted to **M.Sc. RESPIRATORY THERAPY DEGREE COURSE UNDER ALLIED HEALTH SCIENCES** in any one of the affiliated institutions of this University shall

register his / her name with this university by submitting the prescribed application form for registration duly filled in along with the prescribed fee and a declaration in the format to the Controller of Examinations of this University through the affiliated institution within 3 Months from the cut off date prescribed for the course for admission. The applications should bear the date of admission to the said course.

7. MIGRATION/TRANSFER OF CANDIDATE:

(a) A student studying in **M.Sc. RESPIRATORY THERAPY DEGREE COURSE UNDER ALLIED HEALTH SCIENCES** can be allowed to migrate / transfer to another institution of Allied Health Science under the same University.

(b) Migration / Transfer can be allowed to another affiliated institutions under extraordinary circumstances. The Vice - Chancellor has the power to issue Migration / Transfer order.

8. COMMENCEMENT OF THE COURSE:

The course shall commence from **1st September** of the academic year. Cut off date for Admission is **30th September** every year.

9. MEDIUM OF INSTRUCTION:

English shall be the Medium of Instruction for all the Subjects of study and for examinations of the **M.Sc. RESPIRATORY THERAPY DEGREE COURSE UNDER ALLIED HEALTH SCIENCES.**

10. CURRICULUM:

The Curriculum and the syllabus for the course shall be as prescribed in these regulations are subject to modifications by the Standing Academic Board from time to time.

11. DURATION OF THE COURSE:

The duration of certified study for the **M.Sc. RESPIRATORY THERAPY DEGREE COURSE UNDER ALLIED HEALTH SCIENCES** shall be **TWO** years.

12. RE-ADMISSION AFTER BREAK OF STUDY:

The regulations for re-admission are as per the University Common Regulation for Re-admission after break of study for all courses.

13. . WORKING DAYS IN THE ACADEMIC YEAR:

Each academic year shall consist of not less than 270 working days Total No. of working days including (Term day 270 days 85% Attendance) Examination period

14. ATTENDANCE REQUIRED FOR ADMISSION / EXAMINATION:

(a) No candidate shall be permitted to appear in any one of the parts of **M.Sc. RESPIRATORY THERAPY DEGREE COURSE UNDER ALLIED HEALTH SCIENCES** Examinations

unless he/she has attended the course in the subject for the prescribed period in an affiliated institution recognized by this University and produce the necessary certificate of study, attendance and satisfactory conduct from the Head of the institution.
(b) A candidate is required to put in a minimum of 85% of attendance in both theory and practical separately in each subject before admission to the examinations.

15. CONDONATION OF LACK OF ATTENDANCE:
There shall be no condonation of lack of attendance.

16. INTERNAL ASSESSMENT MARKS:
The Internal Assessment should consist of the following points for evaluation:-
i) Theory
ii)Practical
(a) A minimum of three written examinations shall be conducted in each subject during a year and the average marks of the three performances shall be taken into consideration for the award of Internal Assessment marks.

17. CUT-OFF DATES FOR ADMISSION TO EXAMINATIONS:

1. **30th September** of the academic year concerned for Admission.

2. The candidates admitted up to **30th September** of the academic year shall be registered to take up the **1st year examination during October of the next year**.

18. COMMENCEMENT OF THE EXAMINAITONS:
15th October / 15 May
If the date of commencement of examination falls on Saturdays / Sundays or declared Public Holidays, the examination shall begin on the next working day.

19. MARKS QUALIFYING FOR PASS:
50% of marks in the University Theory Examinations
50% of marks in the Practical with Viva
50% of marks in aggregate in Theory, I.A & oral taken together.

20. REVALUATION / RETOTALLING OF ANSWER PAPERS:
Re - totalling / Revaluation of answer papers is not permitted.

21. VACATION:
There is no vacation

22. SCHEME OF EXAMINATIONS:

I YEAR BASIC SCIENCES

PAPER	SUBJECTS	THEORY	PRACTICAL	VIVA	INTERNAL

								ASSESSMENT	
		MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
PAPER-I	PRINCIPLES OF RESEARCH METHODOLOGY, BIOSTATISTICS & MEDICAL ETHICS	100	50					50	25
PAPER-11	APPLIED ASPECTS OF ANATOMY, PHYSIOLOGY AND BIOCHEMISTRY	100	50	100	50	50	25	50	25
PAPER-III	APPLIED ASPECTS OF PHARMACOLOGY, MICROBIOLOGY AND PATHOLOGY	100	50	100	50	50	25	50	25
PAPER-IV	EQUIPMENTS IN RESPIRATORY MEDICINE &ADVANCED RESPIRATORY THERAPY &CRITICAL CARE	100	50	100	50	50	25	50	25

II YEAR

PAPER	SUBJECTS	THEORY		PRACTICAL		VIVA		INTERNAL ASSESSMENT	
		MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
PAPER-I	ADVANCED RESPIRATORY THERAPY – II	100	50	100	50	50	25	50	25
PAPER-11	CRITICAL CARE MEDICINE	100	50	10s0	50	50	25	50	25
PAPER-III	RESPIRATORY AND CARDIO VASCULAR DISEASES	100	50	100	50	50	25	50	25
PAPER-IV	NEONATAL/PEDIATRIC RESPIRATORY CARE	100	50	100	50	50	25	50	25

Theory Examination Pattern

Duration: 3 hrs Max. Marks: 100

Part – A (2 x 20 = 40) Marks

Part – B (10 X 6 = 60) Marks

	Max.	Min.
Project*	100	50
Viva / Practical	100	50
I. A	50	25

Practical's should include the following:
Case Discussion / Flash Card / Spotters / Instruments / Specimens (Where ever it is applicable)

23. Submission of Project:
1. Project should be in a bound volume of a minimum of 30 - 50 pages of typed in Double line spacing and on one side only.
2. The Project should be submitted to the Institution 3 months before the Final Year Examination.
3. The student should prepare a PPT presentation of the project at the time of Viva – Voce Examination.

24. Log Book:
Based on the curriculum Log Book to be maintained and the same are periodically, assessed by the HOD and presented at the time of discussion of project in Practical Examination.

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