

Dow University of Health Sciences

RESPIRATORY MODULE

STUDY GUIDE 2023

First Year MBBS



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INTRODUCTION

WHAT IS A STUDY GUIDE?

A study guide provides a focus for different educational activities in which the students are engaged. It equips students with information on the topic of study and assists in management of student learning. Furthermore, it imparts relevant information about the organization of the module and thus helps students organize their educational activities accordingly. Another important purpose of a study guide is the dissemination of information about rules and policies and teaching and assessment methods.

HOW DOES A STUDY GUIDE HELP LEARNERS?

- Includes information on organization and management of the module.
- Advises the learners about representatives (from various departments) who can be contacted in case of need.
- Defines the objectives which are expected to be achieved at the end of the module.
- Elaborates the learning strategies which will be implemented during the module.
- Informs learners about the learning resources in order to maximize their learning.
- Provides information on the assessment methods that will be held to determine every student's achievement of objectives.

CURRICULUM MODEL:

Integrated modular curriculum is followed at Dow University of Health Sciences for MBBS program. This implies that instead of studying basic and clinical sciences separate and apart, students will experience a balanced and integrated combination of basic and clinical sciences in the form of a system –based modules.

The modular curriculum followed by Dow University of Health Sciences is integrated both in the vertical and the horizontal directions. However in order to prepare the students for clinical teaching with a sound background knowledge of the basic sciences, the curriculum has been divided in three spirals.

The three spirals are:

1. Spiral -1 Basic Sciences
2. Spiral -2 Clinical Sciences
3. Spiral -3 Integrated Supervised Practical Training

The Basic Sciences Spiral is spread over the first two years and clinical sciences spiral is distributed

over the next two years. In the final year students are given practical hands on training in the role similar to that of a shadow house officer. They are encouraged to refer to the theoretical teaching of the first four years for their practical training. The whole curriculum is divided into modules, each module being related to a particular system for example. Cardiovascular 1 module is in the Basic Sciences Spiral and Cardiovascular 2 module is in the Clinical Sciences Spiral.

TEACHING & LEARNING METHODOLOGIES:

The following teaching/ learning methods may be used to facilitate the learning process:

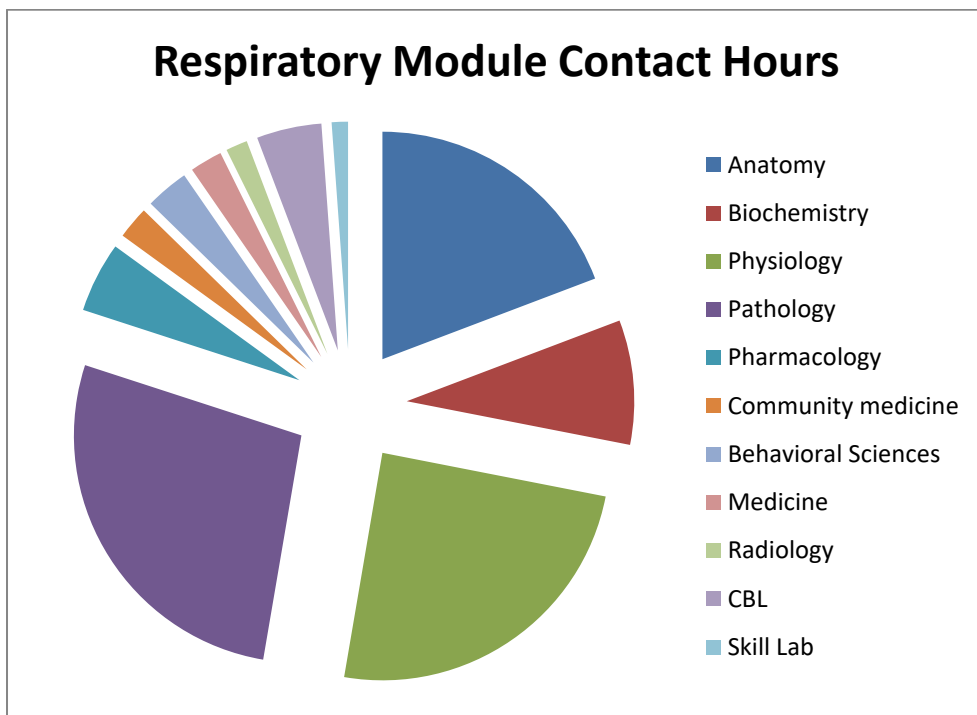
1. **Interactive Lectures:** Lectures are considered as an efficient means of transferring knowledge to large audiences.
2. **Small Group Discussion:** Small group discussion such as case- based learning (CBL) is a form of and interactive learning which helps students develop discussion skills and critical thinking.
3. **Practical:** Practical related to Basic Sciences are held to facilitate student learning.
4. **Skills:** Skills sessions are scheduled parallel with various modules at fully equipped skills lab in which students observe and learn skills relevant to the respective modules.
5. **Self-Directed Learning:** Students have a measure of control over their own learning. They diagnose their needs, set objectives in accordance to their specific needs, identify resources and adjust their pace of learning

5 YEAR CURRICULAR ORGANIZATION

Spiral	year	Modules				
First Spiral	I	FND1- Foundation Cell, Genetics & Cell Death (Basics of Anatomy, Physiology, Biochemistry, Gen. Pathology, Gen. Pharmacology, Community Medicine & Behavioral Sciences, 9 Weeks		HEM1- Blood Module Immunity, Inflammation, Tissue repair, Antimicrobials & Neoplasia 9 Week		
		LCM1- Locomotion Bones, Joints, Nerves & Muscles, 9weeks		RSP1- Respiratory System 6 weeks	CVS1- Cardiovascular System 4 weeks	
	II	NEU1- Nervous System 8 weeks		HNN1- Head & Neck & Special 6 weeks	END1- Endocrinology 5weeks	
		GIL 1-GIT and Liver 8 weeks		EXC1- Renal and Excretory System	REP1- Reproductive System 5 weeks	
Second Spiral	III	Foundation 2 2 wks	IDD 1- Infectious diseases 6 weeks	HEM2- Hematology 5 weeks	RSP2- Respiratory System 5 weeks	CVS2- Cardiovascular System 4 weeks
		GIL 2-GIT and Liver (including Nutritional Disorders) 8weeks			EXC2- Renal & Excretory System 4 weeks	END2- Endocrinology 5 weeks
	IV	ORT2- Orthopedics, Rheumatology, Trauma 7 weeks		PMR-Physical Medicine & Rehabilitation DPS-Dermatology Plastic Surgery / Burns GEN-Genetics 6 weeks		REP2- Reproductive System 8 Weeks
		NEU2- Neurosciences and Psychiatry 8 weeks			ENT* 4 weeks	OPHTHALMOLOGY/EYE 4 weeks
Third Spiral	V	Clinical Rotation 9:45 to 3:00 (with Ambulatory, Emergency, Intensive care) In Medicine, Pediatrics, Cardiology and Neurology units <ul style="list-style-type: none"> ▪ Lecture on problem based approach, twice a week ▪ Ward tutorial twice a week ▪ Student research presentation once a week 			Clinical Rotation 9:45 to 3:00 (Inpatient, Ambulatory, Emergency, Intensive care and Operation Theatres) In Surgery, Gynecology & Obstetrics, Orthopedics and Neurosurgery. <ul style="list-style-type: none"> ▪ Lecture on problem based approach, twice a week ▪ Ward tutorial twice a week ▪ Student research presentation once a week 	

OVERVIEW

Program	MBBS	
Year	One	
Module Title	Respiratory	
Module Code	RSP-1	
Duration	7 weeks	
Contact Hours	Anatomy	25
	Biochemistry	11.5
	Physiology	32
	Pathology	35.5
	Pharmacology	6.5
	Community medicine	3
	Behavioral Sciences	4
	Medicine	3
	Radiology	2
	CBL	6
Skill Lab	1.5	
Total Hours	Respiratory Module	130



INTEGRATED MODULE COMMITTEE

RESPONSIBILITIES	NAMES	DESIGNATION	EMAILS
Chairperson Curriculum Committee, DUHS Chief Module coordinator	Prof. Naheed Khan	Prof. and Chairperson Anatomy	naheed.khan@duhs.edu.pk
Coordinator DMC	Dr. Sabahat Babar	Lecturer	sabahat.babar@duhs.edu.pk
Coordinator DIMC	Dr. Afshan Mehboob	Associate Professor	afshan.khan@duhs.edu.pk
Medical Education	Dr Nooreen Adnan	Senior Lecturer	nooreen.adnan@duhs.edu.pk

MODULE DESCRIPTION:

This module has been designed for students to introduce them to the basic concepts of Respiratory system. This module includes Gross anatomy, Histology, Embryology, Physiology, Biochemistry, Microbiology Pathology, Pharmacology, Medicine, Radiology, Behavioral sciences and Community medicine.

Lectures, tutorials, small group sessions including CBL and practical are important components of this module. Clinical skills which includes a thorough respiratory system examination is included in this module. You will be able to develop problem solving skills to apply your medical knowledge to practical situations by means of group and individual tasks. This study guide has been developed to assist you and keep you focused to achieve your goals.

Welcome to the Respiratory module and it is hoped that students will be able to achieve the desired module learning outcomes.

RATIONALE:

A doctor in Clinical Practice will come across a large number of patients who have disorders related to respiratory system as In our community there is a high prevalence of respiratory diseases particularly in children where the leading cause of morbidity and mortality in children is ARI and pneumonia. To be able to manage these, the basis of oxygen administration and artificial ventilation should be taught in earlier years. The understanding of air flow dynamics will enable the student to understand the diseases like asthma, chronic bronchitis and their remedies. At the same time the diseases related to smoking like lung cancer and chronic bronchitis are also on the rise and a firm understanding of the respiratory system will enable the student to prevent such life- style diseases through spreading relevant health education messages. The student training should also include mechanism and uses of inhalers.

LEARNING OUTCOMES:

By the end of respiratory module the students will be able to:

1. Describe the normal and abnormal structures and functions of respiratory system.
2. Interpret the biochemical changes in the body related to the respiratory system with reference of some common respiratory disorders.
3. Describe normal changes that occur in respiratory system functioning from infancy to old age.
4. Elaborate the pathophysiology and types of infective respiratory disorders
5. Explain obstructive and restrictive pathologies involving respiratory system
6. Identify role of respiratory system in controlling acid-base balance
7. Take history and perform a satisfactory physical examination of the respiratory system.
8. Formulate an appropriate plan for evaluating patients with respiratory signs and symptoms to achieve a reasonable differential diagnosis.

DISCIPLINE-WISE LEARNING OBJECTIVES AND CONTENTS**PHYSIOLOGY****Learning Objectives:**

1. Recognize the role of the various parts of the respiratory system and explain the histology and function of the respiratory membranes.
2. Recall structures involved in breathing, explain changes during inhalation and exhalation, discuss trans pulmonary pressure, understand gas flow principles, and describe the volume-pressure relationship in lung mechanics.
3. Explain how to test for surfactant in amniotic fluid, what surfactant is, and how it works. Discuss the difference between the recoil forces exerted by tissue and those exerted by surface tension.
4. Explain various protective respiratory reflexes, including apnea, cough, sneeze, mucus secretion, airway constriction, Herring-Breuer inflation reflex, and deflation reflex.
5. Define alveolar ventilation, separate conducting and respiratory zones, explain respiratory muscle movements, draw a typical spirometer trace with volumes and capacities, explain pulmonary function tests, and explain negative intrapleural pressures.

6. Explain spirometer components, distinguish volume from capacity, differentiate various lung volumes, and discuss minute ventilation rate, alveolar ventilation rate, and FEV1.
7. Determine the origin and destination of bronchial blood vessels, quantify differences between pulmonary and systemic circulation, explain lung perfusion zones and their consequences, learn how alveolar hypoxia affects lung blood flow.
8. Differentiate Dalton's and Henry's laws, address altitude's effect on oxygen partial pressure, explain oxygen and carbon dioxide diffusion in respiration, and discuss factors affecting their diffusion rates.
9. Describe the ventilation-perfusion ratio and its "optimal value," the pulmonary reflexes used to resolve ventilation or perfusion difficulties, and the difference between perfusion-limited and diffusion-limited gas transport.
10. Explain the influence of gravity on ventilation and perfusion and discuss how increased cardiac output, as in exercise, impacts the ventilation/perfusion ratio.
11. Explain blood transport of O₂ and CO₂ and specify the average number of O₂ molecules bound to hemoglobin in pulmonary arteries and veins in a resting individual.
12. Describe hemoglobin-O₂ relationship and factors affecting its affinity, and explain increased O₂ unloading in active tissues during exercise.
13. Explain carbon dioxide transport in blood, focusing on dissolved CO₂, carbamino compounds, bicarbonate, and the carbon dioxide dissociation curve, along with the Bohr and Haldane effects.
14. Outline the pharmacological treatment options for cyanosis and provide an explanation of how the condition is diagnosed (including the distinction between central and peripheral cyanosis).
15. Explain neural control of breathing, including medullary and pontine centers, and the role of the pre-Bötzinger complex as a respiratory pacemaker.
16. List chemical regulation stimuli, describe central and peripheral chemoreceptors, explain respiration changes during exercise, and discuss how various factors like proprioceptors, the inflation reflex, temperature, pain, and airway irritation affect breathing.
17. Define hypoxia and differentiate between its types (hypoxic, anemic, ischemic, and histotoxic), providing an example for each, and explain the body's response to hypoxia.

18. Evaluate respiratory adaptations to altitude, understand diving-related respiratory changes, including nitrogen narcosis and Caisson's disease.
19. Explain O₂ debt, differentiate between anaerobic and aerobic respiration in relation to O₂ debt, identify causes of O₂ debt, and recognize factors for reducing recovery time.
20. Study the effects of exercise on pulse rate, ventilation rate, and recovery, including changes in heart rate, breathing rate, and oxygen consumption due to increased energy demand, and how exercise affects the Dorsal Respiratory Group.
21. Discuss intrapleural pressure, pneumothorax in chest issues, pleural effusion causes, workup, atelectasis definition, risk factors, and obstructive vs. non-obstructive atelectasis.
22. Explain and compare obstructive and restrictive lung disease pathophysiology, differentiate their pulmonary function test patterns, discuss the significance of FEV₁/FVC, and describe their effects on arterial blood oxygenation.
23. Recognize and classify birth asphyxia, understand hypoxia causes and patient presentation, outline dyspnea causes and its pathophysiology, and identify hypercapnia and its potential consequences if untreated.
24. List indications for mechanical ventilation and common modes, explain ventilator weaning and liberation, implement oxygenation improvement interventions, and describe oxygen toxicity's basic pathophysiology.
25. Learn diving medicine principles, understand decompression sickness, prevent altitude sickness through ascent rate adjustment, and use acetazolamide for prophylaxis and treatment of mountain sickness.

Topics/ Contents:

Lectures: (1 hour each)

- Functional organization of respiratory system
- REVISIT: Introduction to A.N.S (Sympathetic and Parasympathetic)
- Mechanism of Respiration
- Pulmonary and Alveolar Ventilation

- Lung Volumes and Capacities
- Diffusion of Gases Through Respiratory Membrane (Gas Laws, Composition)
- Pulmonary Circulation and Pulmonary Edema
- Abnormal Ventilation/ Perfusion Ratio
- Transport of Oxygen in Blood
- Oxygen Hemoglobin Dissociation Curve
- Transport of CO₂ in Blood CO₂ Dissociation Curve
- Pulmonary Circulation Ventilation/ Perfusion Relationship
- Physiology of Cyanosis
- Respiratory Adjustment to high Altitude, Space and Deep Sea Diving
- Respiratory Changes During Exercise
- Chemical Regulation of Respiration
- Neural Regulation of Respiration
- Oxygen Debt
- Pulmonary Ventilation
- Caisson's Disease, Acute Mountain Sickness
- Obstructive Vs. Restrictive Disease (FEV1/FVC)
- Asphyxia, Hypoxia, dyspnea, Hypo and Hypercapnia
- Artificial Respiration, O₂ Therapy and its Toxicity

Practical: (1.5 Hour each)

- Introduction to Power Lab With Respect to Respiration
- Record the Normal Rate and Pattern of Breathing and to Examine the Effects of Breath Holding on Respiration
- To Study Pulmonary Function Test By Measuring Lung Volumes and Capacities.

Tutorials:

- Diffusion of Gases Through Respiratory Membrane (Gas Laws, Composition)
- Oxygen Hemoglobin Dissociation Curve
- Chemical Regulation of respiration

ANATOMY**Learning Objectives:**

Gross Anatomy

1. Describe the inlet, outlet & boundaries of thoracic cage with different compartments of thoracic cavity.
2. Describe the location, parts, relations, articulation and muscle attachments of the sternum along with its clinical importance.
3. Describe the gross features of the thoracic vertebrae; vertebral body, IV disk, Laminae, pedicles, intervertebral foramina, processes and important ligaments.
4. Discuss the classification of ribs along with features & different parts of typical & atypical rib.
5. Classify and list the joints of thorax
6. Discuss the division, boundaries and contents of superior & inferior mediastinum with applied anatomy.
7. Identify the different layers of thoracic walls, Intercostal muscles, intercostal spaces with its contents.
8. Explain the origin, course and distribution of intercostal vessels & nerves along with related applied anatomy.
9. Describe the origin, insertion, action, nerve supply & openings of the diaphragm with important clinical correlates.
10. Discuss about principles of respiratory movement, movement in different phases of respiration.
11. Describe thoracic sympathetic trunk, thoracic duct, phrenic and vagus nerve.
12. Describe the pleural cavity, gross features, nerve supply & reflections of pleura with its clinical correlation.
13. Explain the difference between right & left lung, borders, surfaces, blood supply, and nerve supply of lungs along with the importance of broncho pulmonary segments.

EMBRYOLOGY

1. Discuss the stages of development of the vertebral column, ribs along with associated congenital anomalies including spina bifida, spondylolisthesis, scoliosis, kyphosis, extra rib, fused rib and pigeon shaped chest.
2. Discuss the formation of laryngo- tracheal tube, Lung Bud, different Stages of development & Maturation of Lung & Clinically correlate the congenital errors during development.
3. Explain intra embryonic coelom or body cavity, the derivatives of visceral and parietal layers of mesoderm, pericardio-peritoneal canals and their final fate, development of diaphragm from various tissue sources & clinically correlate the main anomalies related to body cavities and diaphragm.

HISTOLOGY

1. Describe the structural details, epithelium lining & the histological differences among various parts of respiratory system.
2. Discuss the histological characteristics of larynx & trachea.
3. Describe the microscopic anatomy of respiratory bronchiole. alveolar ducts, alveolar sacs and alveoli.

4. Discuss the importance of blood-air barrier, surfactant, alveolar septum, alveolar pores, different types of cells found in respiratory tract like type 1 and type 2 cells found in alveoli

Topics/ Contents:

Lectures (1 hour each):

- General description of upper respiratory Tract & Lower Respiratory Tract
- Overview of Thorax (Skeleton, Wall, Outlet and Inlet)
- REVISIT: Introduction to A.N.S (Sympathetic and Parasympathetic)
- Thoracic Muscles Wall and intercostal Spaces
- Thoracic Inlet – Relations and Cross sectional anatomy
- Diaphragm (Thoracic Outlet)
- Thoracic Cavity , Division and Boundaries of Mediastinum and Joints of Thoracic Cage
- Thoracic Movements with Respiration (Including Involvement of Abdominal Wall)
- Gross Features of Lungs
- Development of Respiratory System and Developmental Anomalies of Respiratory System (embryology)
- Thoracic Sympathetic Trunk , Phrenic and Vagus Nerve Thoracic Duct
- Development of Ribs and Vertebrae (embryology)
- Lymphatic of Thorax

Practical / Demo:

- Gross Feature of Sternum
- Thoracic Vertebrae (Typical + Atypical)
- General Features + attachments of Atypical Ribs
- General Features of Vertebrae + Curvatures of Vertebral Column
- Pleura
- Anterior Mediastinum and its contents (Thymus)
- Posterior Mediastinum and its contents (Thoracic Aorta, Oesophagus and Azygous Vein)
- Superior Mediastinum and its contents

Learning Objectives:

1. Discuss the synthesis and metabolism of phospholipids.
2. Explain the clinical importance of surfactant and lecithin/ sphingomyelin ratio.
3. Discuss eicosanoid derivatives, synthesis and functions.
4. Rank the importance of eicosanoid derivatives in inflammatory lung diseases.
5. Demonstrate the procedure of a pH meter and its clinical application.
6. Explain the role of buffers in homeostasis.
7. Discuss the role of respiratory system in acid base balance.
8. Describe the principle of Arterial Blood Gases (ABGs)
9. Interpret ABGs values in various clinical scenarios.

Topics/Contents:**Lectures: (1 hour each)**

- Phospholipid Structure and Classification
- Role of Buffers in Homeostasis
- Role of Respiratory System in Acid Base Balance
- Eicosanoids and its Derivatives

Practical:

- Determination of pH by pH Meter
- Interpretation of ABGs

Tutorials:

- Role of Lecithin in ARDS
- Respiratory Compensation in Acidosis and Alkalosis
- Role of Eicosanoids in Respiratory Disorders

PATHOLOGY:**Learning Objectives:**

1. Describe the features of major congenital anomalies of the pulmonary system.
2. Explain the pathology of atelectasis.
3. Describe the types and mechanisms involved in the pathogenesis of pleural effusion and pneumothorax.
4. Classify the chronic obstructive pulmonary disease.

5. Describe the structural and pathological changes related to COPD.
6. Describe the clinical features and diagnostic related to COPD.
7. Explain the features of major vascular disorders of the pulmonary system.
8. Describe the role of VQ scan.
9. Characterize ARDS and pulmonary embolism with their major features and diagnostics
10. Classify pneumonia according to etiology.
11. Explain differentiating features of different types of pneumonia.
12. Explain clinical features and pathogenesis of pneumonia.
13. Describe the features of TB.
14. Characterize Mycobacterium tuberculosis and different atypical mycobacteria.
15. Enlist various agents causing respiratory infections along with their features.

Topics/ Contents:

Lectures:

- Congenital anomalies and Atelectasis, Pleural effusion and Pneumothorax
- COPD-1-Emphysema
- Surfactant and Compliance
- COPD-2-Bronchiectasis and Chronic Bronchitis
- COPD-3- Asthma
- Histology of Alveolar Capillary Membrane + General Description of Tissue Arrangement in Hollow Viscera
- Classification of Pneumonia Common typical and atypical pneumonia,, Aspiration pneumonia
- Pulmonary Vascular Disorders (pulmonary embolism + V/Q Scan)
- ARDS and Pulmonary Edema
- Common Pathogens causing Community Acquired Pneumonias (typical and atypical)
- Pneumonia: Review
- Pathology of Tuberculosis
- Mycobacterium Tuberculosis and Atypical Mycobacteria (Microbiology)
- Gram Negative Rods causing Respiratory Infections
- Respiratory Viruses
- Respiratory Epithelium + Larynx and Trachea + Lungs (Histology)

Practical:

- Respiratory Epithelium + Larynx and Trachea (Histo)
- Lungs (Histo)

- COPD
- ARDS
- Microscopic stages of pneumonia
- Tuberculosis
- Tuberculosis + ZN Staining

Tutorials:

- Microscopic features of Tuberculosis and ZN staining
- Pulmonary and Alveolar Ventilation

CBL:

- Asthma
- Pneumonia
- Tuberculosis
- Pulmonary embolism

PHARMACOLOGY

Learning Objectives:

At the end of the module students should be able to:

- Enlist important diseases related to respiratory system
- Classify drugs used in the treatment of Bronchial Asthma
- Understand the concept of acute and prophylactic treatment of Asthma
- Identify drugs used in the treatment of tuberculosis(T.B)
- Know the concept of Ist line and 2nd line antituberculous drugs
- Identify important adverse effects of Ist-line antituberculous drugs.

Topics/Contents:**Lectures: (1 Hour each)**

- Drugs Used in Respiratory Diseases I (Asthma)
- Drugs Used in Respiratory Diseases II (Tuberculosis)
- Skeletal Muscle Relaxant

Practical / Tutorials:

- Skeletal Muscle Relaxant
- Drugs Used in Respiratory Diseases

COMMUNITY MEDICINE

Learning Objectives:

1. Analyze the origin and determinants of diseases
2. Identify causative agents for viral, and typical and atypical bacterial pneumonia
3. Identify various types of acute respiratory infections in different populations and in different age groups.

Topics/Contents:

Lectures: (1 Hour each)

- Origin and Determinants of Diseases
- Acute Respiratory Tract Infection and its Prevention

MEDICINE

Learning Objectives:

1. Describe the parameters of Pulmonary Function Tests in order to differentiate between obstructive and restrictive lung diseases.
2. Enumerate the different signs elicited after a clinical examination of a patient with respiratory disorders
3. Correlate the signs and symptoms of respiratory disorders on the basis of physical examination
4. Describe the parameters measured as arterial blood gases within their normal ranges (pH, pCO₂, HCO₃, pO₂).
5. Describe the steps to interpret ABGS.

Topics/Contents:**Lectures: (1 hour each)**

- Pulmonary Function Test
- Lab Investigation and Interpretation for Respiratory Status ABG's
- Sign and Symptoms and Clinical Examination of Respiratory System

RADIOLOGY**Learning Objectives:**

- Describe different structures that can be identified on CT chest
- Recognize different levels of mediastinal CT
- Describe the appearance of lung parenchyma on CT chest RSP 1 Rad 2Radiology
- Recognize the normal respiratory structure on chest radiograph.
- Discuss the positions of the lobes. Name structures making right & left heart borders
- Identify nasal structures RSP 1 Rad 3Radiology and Imaging of Respiratory System
- Read a normal chest X-ray
- Identify the main regions where a chest X-ray may show an abnormality
- Describe how different tissue appear on chest X-ray

Topics/Contents:

- Radiological Anatomy of Respiratory System on CX
- Cross Sectional (CT) anatomy of Respiratory System

BEHAVIOURAL SCIENCES**Learning Objectives:**

At the end of respiratory module I, students will be able to :

Understand responsibilities of a doctor, psychosocial aspects of aging, learning through behavioral modification such as breathing exercises, emotions and it's application in clinical practice.

Topics/Contents:**Lectures (1 hour each):**

- Levinson Seasons of Life: Stages of Adulthood: Young or Early Adulthood, Middle Adulthood, Late Adulthood
- Redefining Aging
- Emotions: Theory and Application
- Learning and Behavior
- Duties and responsibilities of a doctor

SKILLS LAB

Learning Objectives:

- Familiarize with the correct method of inspection, palpation and percussion of chest.
- Demonstrate correct technique of auscultation of chest

Topics / Contents: (Small Group / Hands on activity)

Introduction to Respiratory System

CBL (Case Based Learning)

S. No	CBL Topic	CBL Objectives
CBL 1	Pneumonia	<ul style="list-style-type: none"> • Define pneumonia. • List the pathogens known to be causative agents of pneumonia. • Explain the pathogenic mechanism of pneumonia. • Describe the findings of lung consolidation and discuss its clinical implication. • Enlist the complications of pneumonia. • Describe the clinical course of pneumonia.
CBL 2	Pulmonary embolism	<ul style="list-style-type: none"> • To learn types & mechanisms of hypoxia • To learn common causes of sudden onset of Chest pain • To learn common causes of acute shortness of breath • To learn mechanism of hypoxia responsible for acute pulmonary embolism
CBL 3	Asthma	<ul style="list-style-type: none"> • Describe the major difference between obstructive and restrictive lung pathology • Explain different lung capacities and volumes. • Interpret the effect of bronchodilators on lung volumes in a obstructive scenario. • Describe different treatment options for the given pathology. • Interpret the X-ray findings for the given scenario.
CBL 4	Tuberculosis	<ul style="list-style-type: none"> • Identify the patient having tuberculosis • Describe the pathophysiology of the given pathology • Interpret different types of tuberculosis • Define the management for the given scenario.

ASSESSMENT

Assessment will be done in two parts:

At the end of module

- Module Exam (Theory) -20%
- Module Exam Practical Internal Evaluation- 20%

At the end of Year

- Annual Exam (Theory) -80%
- Annual Exam (ospe, Viva)-80%

MCQs (Multiple choice questions), OSCE (Objective Structured Clinical Exam) and structured vivas will be the main assessment tool.

S.No	Subject	Readings
1	University of Health Sciences ANATOMY	<ul style="list-style-type: none"> Moore KL, Dalley AF. Clinically oriented anatomy. South Asia ed. India. Wolters Kluwer; 2018 Jul 12. 1 YEAR MBBS HEMATOLOGY MODULE Drake R, Vogl AW, Mitchell AW, Tibbitts R, Richardson P. Gray's Atlas of Anatomy E-Book. Elsevier Health Sciences; 2020 Feb 27. CLINICAL ANATOMY BY REGIONS (REFERENCE BOOK) Richard S. SNELL 9th EDITION LAST'S ANATOMY: REGIONAL & APPLIED (REFERENCE BOOK) Chummy S. Sinnatamby 12th or Latest EDITION ATLAS OF HUMAN ANATOMY FRANK H NETTER 6th EDITION
2	EMBRYOLOGY	<ul style="list-style-type: none"> LANGMAN'S MEDICAL EMBRYOLOGY T.W. SADLER 13th EDITION THE DEVELOPING HUMAN CLINICALLY ORIENTED EMBRYOLOGY (REFERENCE BOOK) MOORE & PERSAUD & TORCHIA 10th EDITION
3	HISTOLOGY	<ul style="list-style-type: none"> MEDICAL HISTOLOGY LAIQ HUSSAIN SIDDIQUI 5TH or Latest EDITION WHEATERS FUNCTIONAL HISTOLOGY BARBARA YOUNG 5th EDITION BASIC HISTOLOGY(TEXT AND ATLAS) (REFERENCE BOOK) LUIZ JUNQUEIRA, JOSE CARNEIRO Latest EDITION
4	PHYSIOLOGY	<ul style="list-style-type: none"> GUYTON AND HALL TEXTBOOK OF MEDICAL PHYSIOLOGY GUYTON AND HALL 13th EDITION
5	BIOCHEMISTRY	<ul style="list-style-type: none"> LIPPINCOTT'S ILLUSTRATED REVIEWS SERIES DENISE R. FERRIER 6th EDITION HARPERS ILLUSTRATED BIOCHEMISTRY (REFERENCE BOOK) VICTOR RODWELL, DAVID BENDER, KATHLEEN M. BOTHAM, PETER J. KENNELLY, P. ANTHONY WEIL 28th EDITION
6	COMMUNITY MEDICINE	<ul style="list-style-type: none"> PUBLIC HEALTH AND COMMUNITY MEDICINE SHAH, ILYAS, ANSARI 7th EDITION
7	PATHOLOGY	<ul style="list-style-type: none"> ROBBINS BASIC PATHOLOGY KUMAR & ABBAS 9TH EDITION ROBBINS & COTRAN PATHOLOGIC BASIS OF DISEASE (REFERENCE BOOK) KUMAR & ABBAS & ASTER 9th EDITION
8	MICROBIOLOGY	<ul style="list-style-type: none"> REVIEW OF MEDICAL MICROBIOLOGY AND IMMUNOLOGY WARREN LEWINSON 14th EDITION
9	PHARMACOLOGY	<ul style="list-style-type: none"> LIPPINCOTT'S ILLUSTRATED REVIEW PHARMACOLOGY KAREN WHALEN 6th or Latest Edition BASIC AND CLINICAL PHARMACOLOGY (REFERENCE BOOK) BERTRAM G. KATZUNG 11th EDITION

10	CLINICAL SKILLS	<ul style="list-style-type: none">•• MACLEOD'S CLINICAL EXAMINATION DOUGLAS & NICOL & ROBERTSON 13TH or Latest Edition • HUTCHISON'S CLINICAL METHODS• WILLIAM M DRAKE & MICHAEL GLYNN• 23rd or Latest Edition
11	MEDICINE	<p>PRINCIPLES & PRACTICE OF MEDICINE DAVIDSON'S 22nd or Latest Edition</p> <p>ESSENTIALS OF KUMAR AND CLARK'S CLINICAL MEDICINE KUMAR & CLARK 9th or Latest Edition</p>