Syllabus: Respiratory System (111501205)
Second Year- Second Semester, 2025/2026

COURSE INFORMATION

Course Name: Respiratory System **Semester:** Second semester, Second year **Department:** Department of Microbiology, Pathology, and Forensic Medicine **Faculty:** Faculty of Medicine	**Course Code:** 111501205 **Section:** Preclinical Module **Core Curriculum**: MD Program
Day(s) and Time(s): Sunday-Thursday, 9:30 am-3:00 pm. (Teaching Period: March 25, 2026 – April 30, 2026) **Classroom:** Theoretical lectures: Faculty of Medicine Auditorium. Practical Labs: Labs of anatomy, physiology, pathology, and microbiology, Ibn Sina Complex	**Credit Hours:** 5 **Prerequisites**: None

COURSE DESCRIPTION

The respiratory module is a five-credit-hour course with around 50 lectures and eight practical labs included. This course integrates all basic science disciplines in one system-based course to discuss respiratory system-related topics. Each basic science department is incorporated into an integrated body of knowledge covering anatomy, physiology, pharmacology, pathology, biochemistry, and microbiology. The goals of this course will be achieved via lectures and relevant laboratory practical sessions. More specifically, respiratory system (RS)-related topics will be covered first to provide basic knowledge and understanding of the structure, function, biochemical basis of function, and the pathological basis of respiratory disorders in the lungs and airways. During the course and whenever relevant, the students are exposed to clinical problems and cases to emphasize the explanations of symptoms, signs, investigations, and forms of treatments. Practical sessions are mostly planned to be stations to allow students to expose their knowledge for discussion and confirm concepts learned in lectures. Research ideas are also included to emphasize social responsibility, evidence-based medicine, and innovative thinking.

DELIVERY METHODS

The course will be delivered through a combination of active learning strategies. These will include:

- PowerPoint lectures and active classroom-based discussion.
- Live Online delivered lectures.
- Relevant papers and reading documentaries.
- E-learning resources: e-reading assignments and practice quizzes through Microsoft Teams.
- Practical laboratory sessions.

COURSE COORDINATOR INFORMATION (Pathology lecturer)

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REFERENCES AND LEARNING RESOURCES

Required Textbooks:

Author	Title
Anatomy: - Richard Drake - Gerard J Tortora, Mark Nilsen - K.L. Moore and T.V.N. Persaud - Clinical Anatomy for Medical Students - L. Carlos Junqueira	- Grey's anatomy for students, 4th edition - Principles of Human Anatomy, 14th edition - Before we are birth, 10th edition - Richard S Snell, 5th edition - Moore Clinically Oriented Anatomy, 8th edition - Basics of Histology, 12th edition
Physiology **Recommended Textbook** -Guyton and Hall Textbook of Medical Physiology **Suggested additional resources** 1. Costanzo Physiology, 7th Edition, 2. Ganong's Review of Medical Physiology, Twenty Sixth Edition, 26th Edition	Guyton and Hall Textbook of Medical Physiology (Guyton Physiology) 15th Edition by John E. Hall PhD (Author), Michael E. Hall MD MSc. (Author) Publication Date: 11 Jul 2025 Copyright © 2021 by Elsevier, Inc. 1. Costanzo Physiology, 7th Edition, Author : By Linda S. Costanzo, PhD: ISBN**9780323793339** Copyright © 2021 by Elsevier, Inc. 2. Ganong's Review of Medical Physiology, Twenty Sixth Edition, 26th Edition By Kim E. Barrett, Susan M. Barman, Jason Yuan and Heddwen L. Brooks ISBN10: 1260122417 | ISBN13: 9781260122411 © 2019 Published December 31, 2018 Copy right © 2026 McGraw Hill
Biochemistry:	

Required Textbook: - Victor W. Rodwell , David A. Bender , Kathleen M. Botham , Peter J. Kennelly , P. Anthony Weil. **Suggested Additional Resources**: - Thomas M. Devlin.	-Harper's Illustrated Biochemistry (McGraw-Hill Education / Medical; 31st edition (May 28, 2018). ISBN-13: 978-1259837937, ISBN-10: 1259837939. -Textbook of Biochemistry with Clinical Correlations (John Wiley & Sons; 7th edition (January 19, 2010). ISBN-10: 0470281731, ISBN-13: 978-0470281734
Microbiology: - Sherris Medical Microbiology - Warren Levinson, Peter Chin-Hong, Elizabeth A. Joyce, Jesse Nussbaum, Brian Schwartz	- Medical Microbiology. An Introduction to Infectious Diseases, latest edition - Review of Medical Microbiology and Immunology, Seventeenth Edition 17th Edition
Pathology: - Kumar, Abbas &Aster	- Robbins Basic Pathology, Elsevier Inc:10th edition, (2018). ISBN: 978-0-323-35317-5.
Pharmacology: - Lipincott's - Bertram Katzung and Anthony Trevor	-Illustrated Reviews Pharmacology, latest edition - Basic and Clinical Pharmacology 15th edition
Public Health (Community Medicine):	-Textbook of Respiratory Medicine: Current Knowledge and Recent Advances in Pathobiology, Epidemiology, and Management of Lung Diseases" by Atul Choube, published in 2023. -WHO Reports on Global Health Statistics -CDC and National Health Institutes Data -Recent epidemiological studies on respiratory diseases

TOPICS DETAILS/ STUDENT LEARNING OUTCOMES MATRIX

Course objectives	Course student learning outcomes			Assessment method
A-Biomedical: 1. Describe structures of the respiratory organs (nose, pharynx, larynx, trachea, bronchi, and lung), as well as their development, their histology, and their blood supply. 2. Describe the mechanics of pulmonary ventilation and the major mechanisms involved in the regulation of respiration. 3. Explain how the respiratory gasses are exchanged and carried throughout the body. 4. Develop an understanding of the respiratory system and hemoglobin roles in the acid base balance 5. Identify and describe the major causes, pathogenesis, morphological changes, and complications of	**Topic (subjects& number of lectures/ subject)**	**Subject**	**Intended Learning Outcomes**	
	Topic 1: Upper respiratory tract (4 lectures): Anatomy: 3 Pathology: 1	**Anatomy:** 1. Overview of Anatomy of the Respiratory System -Upper respiratory system (I): Nose 2. Upper respiratory system (I): Paranasal Sinuses and Microscopic Features 3. Upper respiratory system (II): Larynx and pharynx	- Describe the general structures and organs of the respiratory system. - Describe the anatomical and functional subdivisions of the respiratory system. - Describe the structure of the external nose with its blood and nerve supply. - Describe the structure of the nasal cavity including the nasal septum. - Locate the openings of the paranasal sinuses and naso-lacrimal duct in the nasal meatuses. - Describe the nerve and blood supply of the nasal cavities, and its relation to epistaxis. - Discuss microscopic structure of nose - Describe the larynx (definition, extension, size, and construction). - Understand the Laryngeal ligaments and membranes - Discuss the laryngeal inlet and laryngeal cavity. - Describe the laryngeal muscles, actions, and nerve supply. - Enumerate the blood supply of the larynx. - Describe the pharynx (structure, boundaries, and parts) - Describe the interior of the pharynx - Define Palatine tonsils (Anatomy and applied anatomy). - Describe the microscopic structure of the upper respiratory passage - Discuss microscopic structure of larynx and pharynx	**Exams**
		Pathology: 1. Upper Respiratory Tract pathology	- Discuss the clinical features, morphology and prognosis of nasal polyps, nasopharyngeal carcinoma and laryngeal lesions including vocal cord nodules, papilloma, and carcinoma.	

various disease processes that affect the respiratory tract. 6. Identify various bacteria, viruses, parasites, and fungal infections, which infect the respiratory tract and to understand principles of diagnosis, treatment, and prevention. 7. Identify the major environmental factors which contribute to diseases of the respiratory system and to understand their epidemiological pattern in the community. 8. Understand the major pharmacological principles, which provide the basis for the treatment of infection including tuberculosis, cough, and bronchial asthma, as well as the pharmacology of anti-histamine drugs. 9- Identify the Public health issues	**<u>Topic 2: Breathing</u>** **(16 lectures)** Anatomy: 5 Physiology: 5 Pathology:2 Pharmacology:4	**<u>Anatomy:</u>** 4. Thoracic Wall and Surface Anatomy 5. Lower Respiratory System (I): Trachea and bronchi 6. Lower Respiratory System (II): lung and pleura 7. Mediastinum and Diaphragm 8. Development of the Respiratory System	- Describe trachea (beginning, ending and important relations). - Identify Blood supply of trachea. - Study the lymphatic drainage of trachea - Study nerve supply of trachea - Compare between right and left main bronchus and its clinical importance. - Study segmental divisions of bronchi. - Identify the bronchopulmonary segments & their clinical significances - Describe the microscopic structure of trachea and bronchi - Describe Lung (shape, surfaces, and borders). - Identify contents of the root of the right and left lung. - Discuss relations of the mediastinal surface of the lung. - Understand blood supply and nerve supply of the lung - Compare between right and left lung. - Define parts of the pleura, blood supply and nerve supply of pleura. - Define surface anatomy of the lung and pleura - Describe the typical appearance of chest X rays. - Study the microscopic structure of the main bronchi and their subdivisions. - Study the microscopic structure of the lung parenchyr - Describe the shape and outline of thoracic cage - Describe the anatomical landmarks of the anterior chest wall. - List the various structure marking of thoracic wall - Describe muscles of thoracic wall including nerve, blood supply and actions. - Classify ribs, name their various parts - Define intercostal spaces and discuss their various components including intercostal muscles - Define mediastinum and its anatomical parts - Discuss contents of each part of mediastinum - Describe the diaphragm (origin, insertion, nerve supply and action). - Describe the major and minor opening of the diaphragm. - Describe the development of the nasal cavity. - Describe the development of the lungs and bronchi	

associated with COVID19. 10-Correlate the basic biomedical knowledge to the clinical skills **B-Critical thinking skills**: 1-Observe, identify, and predict health problems based on previous experience and make decisions based on evidence rather than opinion 2- Draw conclusions about the collected data (inference). 3- Maintain good communication habits, such as active listening and respect. 4-Improve problem-solving skills. 5-Demonstrate knowledge of resources and tools available to support lifelong learning		**Physiology:** 1. Mechanics of breathing 2. Lung compliance and airways resistance 3. Lung volumes and capacities 4. Pulmonary and alveolar ventilation 5. Pulmonary perfusion and pulmonary circulation	- Review the physiological anatomy of the pulmonary system and define conducting and respiratory zones. - list the respiratory muscle and describe their function during tidal and forcefully breathing (Review) - List the major functions of the lungs. - Define cellular respiration and external respiration and understand the steps of external respiration. - Define the mechanical interaction of the lung and the chest wall. - Describe the generation of a pressure gradient between the atmospheres and the alveoli. - Define intrapleural pressure, alveolar pressure, transpulmonary pressure, and elastic recoil pressure - Identify the forces that generate the negative intrapleural pressure when the lung is at functional residual capacity, - Predict the direction that the lung and chest wall will move if the air is introduced into the pleural cavity (pneumothorax). - Define tidal breathing and describe the changes in alveolar pressure, transpulmonary and intrapleural during each respiratory cycle. - Describe how differences in pressure between the atmosphere and alveoli cause air to move in and out of the lungs during normal breathing. - Diagram how pleural pressure, alveolar pressure, airflow, and lung volume change during a normal quiet breathing cycle. Identify on the figure the onset of inspiration, cessation of inspiration, and cessation of expiration. • Define lung compliance and identify two common clinical conditions in which lung compliance is higher or lower than normal. • Describe and draw the pressure-volume of the lung (compliance) curves for the lungs. • Draw a normal pulmonary pressure-volume (compliance) curve (starting from residual volume to total lung capacity and back to residual volume), labeling the inflation and deflation limbs. • Define surface tension and describe how it applies to lung mechanics, including the role of pulmonary surfactant and alveolar interdependence in the recoil and expansion of the lung and the role of surfactants in preventing atelectasis.	

			• Define airway resistance and review the biophysical physical principles of airway resistance. • Define Laminar and turbulent Flow (Review) • Identify the chief site of airway resistance under normal conditions. • Describe the effects of changing lung volumes on resistance • Describe humeral and neural control of airways resistance • Describe the dynamic compression of airways during forced expiration and its physiological significance. • List the factors that contribute to the work of breathing. • -Predict alterations in the work of breathing in different physiologic and pathologic states. • Define spirometry and spirogram • Determine standard lung volumes • Deferential between static and dynamic of FVC • Define FEV1 and determine its normal value • Demine FEV1/FC ration • Demine the clinical significance of measurements of lung volume Define flow volume curves and understand their clinical significance • Define standard lung volumes measures by spirometer (review) • Define and contrast the following terms: anatomic dead space, physiologic dead space, wasted (dead space) ventilation, total minute ventilation and alveolar minute ventilation. • Calculate alveolar ventilation and minute ventilation • Predict the effects of alterations of alveolar ventilation on alveolar carbon dioxide and oxygen levels. • Define and contrast the relationships between alveolar ventilation and the arterial PCO2 and PO • Understand Fowler's method of measuring the anatomic dead space • -Calculate the volume of dead space in a lung using the Bohr equation • Describe and explain the regional differences in alveolar ventilation in the normal lung.	

			• Review the physiological anatomy of the pulmonary circulation • Compare and contrast the bronchial circulation and the pulmonary circulation and their functions • Contrast the systemic and pulmonary circulations with respect to pressures, resistance to blood flow, and response to hypoxia. • Describe how pulmonary vascular resistance changes with alterations in cardiac output or pulmonary arterial pressure. Explain in terms of distention and recruitment of pulmonary vessels. • Identify the neural and humoral factors that influence pulmonary vascular resistance and pulmonary blood flow. • Describe how pulmonary vascular resistance changes with lung volume. Explain in terms of alterations in alveolar and extra-alveolar blood vessels. • Describe the consequence of hypoxic pulmonary vasoconstriction on the distribution of pulmonary blood flow. • Predict the effects of alterations in alveolar pressure, pulmonary arterial and venous pressures, and body position on the regional distribution of pulmonary blood flow. • Explain pathophysiology of pulmonary edema development of pulmonary edema	

		<u>Pathology:</u> 2,3. Obstructive Lung diseases (I and II)	- Mention the general characteristics of obstructive lung diseases. - Define emphysema, and discuss the different types, etiology, pathogenesis, clinical and pathologic (gross & microscopic) features, effects, & complications of emphysema. - Discuss briefly the different conditions related to emphysema, including (1) compensatory, (2) obstructive, (3) bullous & (4) interstitial emphysema. - Define chronic bronchitis, describe the etiology, types, pathogenesis, pathologic feature, and clinical course of chronic bronchitis. - Define asthma, describe the etiology, types, pathogenesis, pathologic features, clinical course, and prognosis of asthma. - Define bronchiectasis, describe the etiology, pathogenesis, pathologic features, clinical course, and complications of bronchiectasis.	
		<u>Pharmacology</u> 1.Treatment of COPD 2,3. Treatment of bronchial asthma 1& 2 4.Treatment of cough and allergic rhinitis	- Review the pathophysiology of COPD and the risk factors. - Understand COPD therapeutic approach - Describe the mechanisms of action, pharmacokinetics, uses and side effects of agents can be used for COPD management - Describe the pathophysiology, etiology, and clinical presentations with special emphasis on factors known to provoke the attacks of bronchial asthma. - Understand the aims of therapy of bronchial asthma. - Be familiar with some examples of drugs that can be used in the treatment of bronchial asthma with their method of administration, mechanisms of action, pharmacokinetics, and side effects, such as Beta-agonists Corticosteroids, Anticholinergic agents, Theophylline, Mast – cell stabilizers, Anti-leukotrienes, and Others. - Understand the pathophysiology of cough.	

			- Understand the sites of actions of antitussive given example - Understand the mechanism of action of mucolytic agents and give examples - Review histamine synthesis, storage, release, actions, and the clinical manifestations of histamine shock. - Understand the mechanisms of actions of antihistamine drugs. - Be able to classify, and understand the pharmacokinetics, uses, and adverse effects of antihistamine drugs	
	Topic 3: Ventilation (10 lectures) Physiology: 4 Biochemistry:4 Pathology:2	**Physiology** 6.Pulmonary gas exchanges Gas Diffusion and diffusion capacity of the lung 7. Gas transport 8.Ventilation perfusion ration 9.Control of breathing	• Review the chemical principles of gasses partial pressure and define the concept of gas partial pressure • Identify the partial of gases PO2 and PCO2 in different parts of respiratory system • Identify the values of PO2 & PCO2 in inspired air, alveolar air, and. inspired expired • Identify the partial of gases PO2 and PCO2 in the systemic and pulmonary circulation • Identify the PO2 and PCO2 of arterial and venous blood. • Define diffusion, and state Fick's law for diffusion (Review) • Describe the anatomical features of the alveolar capillary membrane. (Review) • Discuss and describe the diffusion of O2 and CO2 through the alveolar capillary membrane and list the factors affecting the rate of gas diffusion • Distinguish between perfusion limitation and diffusion limitation of gas transfer in the lung. • Define oxygen diffusing capacity and describe the rationale and technique for the use of carbon monoxide to determine diffusing capacity. • List main causes leading to decreased diffusion capacity of the lung • •Define Alveolar O2, Arterial PO2 gradient (A-a gradient) • Be able to calculate the alveolar to arterial PO2 difference, (A-a). • Define diffusion capacity of the lung of O2 and understand how to measure the diffusion capacity of the lung • List causes of decreasing diffusion capacity of the lung	

			• Compare and contrast the diffusion capacity of lung to various gases • State the relationship between the partial pressure of oxygen in the blood and the amount of oxygen physically dissolved in the blood. • Describe the chemical combination of oxygen with hemoglobin and the oxyhemoglobin dissociation curve. • Define hemoglobin saturation, oxygen-carrying capacity, and oxygen content. • State the physiologic consequences of the shape of the oxyhemoglobin dissociation curve. • List the physiologic factors that can influence the oxyhemoglobin dissociation curve, and predict their effects on oxygen transport by the blood. • State the relationship between the partial pressure of carbon dioxide in the blood and the amount of carbon dioxide physically dissolved in the blood. • Describe the transport of carbon dioxide as carbamino compounds with blood proteins. • Explain how most of the carbon dioxide in the blood is transported as bicarbonate. • Describe the carbon dioxide dissociation curve for whole blood • Define Haldane effect • Describe and explain the regional differences in alveolar ventilation in upright lung • Describe the regional differences in pulmonary blood flow in an upright person. Define zones I, II, and III in the lung, with respect to pulmonary vascular pressure and alveolar pressure • Explain the regional difference of pulmonary blood flow and the effect of gravity on pulmonary blood flow. • Describe the interrelationships of alveolar pressure, pulmonary arterial pressure, and pulmonary venous pressure and their effects on the regional distribution of blood flow. • Describe how the ventilation/perfusion (V/Q) ratio of an alveolar-capillary lung unit determines the PO2 and PCO2 of the blood emerging from that lung unit. • Identify the average V/Q ratio in a normal lung and explain how V/Q is affected by the vertical	

			distribution of ventilation and perfusion in the healthy lung • Define right-to-left shunts, anatomic and physiological shunts, and physiologic dead space (wasted ventilation).. • Describe the airway and vascular control mechanisms that help maintain a normal ventilation/perfusion ratio. Describe two causes of abnormal V/Q distribution. • Describe the general organization of the respiratory control system. • Identify the regions in the central nervous system that play important roles in the generation and control of cyclic breathing. • Describe the central and peripheral chemoreceptors and their role in the control of ventilation • List the anatomical locations of chemoreceptors sensitive to changes in arterial PO2, PCO2, and pH that participate in the control of ventilation. • Describe the effects of alterations in body oxygen, carbon dioxide, and hydrogen ion levels on the control of breathing and understand the integrated responses to CO2, hypoxia, pH and identify the relative importance of each in sensing alterations in blood gasses • List the cardiopulmonary and other reflexes that influence the breathing pattern. • State the ability of the brain cortex to override the normal pattern of inspiration and expiration temporarily	
		<u>Biochemistry</u> 1.RDS, α1-Antitrypsin deficiency and cystic fibrosis 2.Arterial Blood Gases (ABG) 3.Acid-base balance & the respiratory system	- Describe the synthesis and biochemical role of surfactant - Describe the clinical significance and the biochemical basis underlying insufficient surfactant production, α1-Antitrypsin deficiency and cystic fibrosis - Interpret the normal values of Arterial Blood Gases (ABGs) - Interpret the ABGs in various clinical disorders - Discuss the ABGs in compensated Acid base Disorders - List the PH fighters and types of buffers - Explain the role of respiration in pH regulation - Describe respiratory acidosis and respiratory alkalosis	

		4.Role of hemoglobin in acid base balance	- Explain the mechanism of pH regulations in respiratory disturbances - Explain the role of hemoglobin in the delivery of oxygen, removal of waste and buffering - Describe the allosteric effects of H+, 2,3-BPG and CO2 on the ability of Hb to reversibly bind oxygen. Explain how these effects enable appropriate oxygen delivery to tissues, buffering of the blood, and CO2 removal.	
		<u>Pathology</u> 4. Chronic interstitial (Restrictive) lung diseases I, Atelectasis and Acute Respiratory Distress Syndrome (ARDS) 5. Chronic interstitial (Restrictive) lung diseases II and pulmonary diseases of vascular origin	- Describe the structure of the normal alveolar wall. - Define atelectasis and discuss its different types, morphology, and outcomes. - Define acute respiratory distress syndrome (ARDS) and list the different etiologic disorders associated with its development. - Discuss the pathogenesis, gross & microscopic features, & the clinical course of ARDS. - Comment briefly on neonatal respiratory distress syndrome (NRDS) - Define restrictive lung diseases. - Mention the general characteristics of chronic restrictive interstitial lung diseases. - Discuss in detail idiopathic pulmonary fibrosis including pathogenesis, morphology (gross & microscopic) and clinical course. - Briefly talk about other patterns of fibrosing interstitial lung diseases including 1. Nonspecific interstitial pneumonia, 2. Cryptogenic organizing pneumonia, 3. collagen vascular diseases associated lung diseases and 4. drug and radiation related diseases. - Discuss in detail pneumoconiosis, including pathogenesis, gross & microscopic features, effects & complications of (1) coal workers' pneumoconiosis, (2) silicosis, & (3) asbestosis - Discuss in detail sarcoidosis, including epidemiology, pathogenesis, clinical features, morphologic features, and clinical course. - Define hypersensitivity pneumonitis and describe the pathogenesis, morphology, and clinical features. - Discuss smoking related interstitial lung diseases including DIP and RBILD.	

			- Describe the definition, causes, pathogenesis, morphology, and clinical features of pulmonary hypertension. - Briefly discuss diffuse alveolar hemorrhage syndromes including Good pasture syndrome and granulomatosis and polyangiitis.	
	Topic 4: Infections (13 lectures) Microbiology: 8 Pathology:2 Pharmacology:3	**Microbiology** 1.Streptococcus pyogenes and Corynebacterium diphtheriae. 2.Haemophilus influenzae, Bordetella pertussis and Pseudomonas aeruginosa. 3. Streptococcus pneumonia, Klebsiella pneumonia, Bacillus anthracis. 4. Mycobacterium tuberculosis and atypical mycobacteria. 5. Atypical pneumonia (Mycoplasma, Legionella and others). 6. Myxoviruses and Rhinovirus. 7. Coronavirus and Adenovirus	-Be familiar with definition, pathogenesis, clinical pictures and diagnostic approaches of Upper, Middle and Lower respiratory tract infections. -List important bacterial causes of RTI. -Describe microbiological aspects, virulence factors, pathogenesis, diagnosis and treatment of Streptococcus pyogenes. -Describe microbiological aspects, virulence factors, pathogenesis, diagnosis, treatment and prevention of Corynebacterium diphtheria. -Understand microbiological aspects, virulence factors, pathogenesis, diagnosis, treatment and prevention of Haemophilus influenzae. -Describe microbiological aspects, virulence factors, pathogenesis, diagnosis, treatment and prevention of Bordetella pertussis. -Describe microbiological aspects, virulence factors, pathogenesis, Clinical findings, diagnosis, treatment and resistance of Pseudomonas aeruginosa. -Understand microbiological aspects, virulence factors, pathogenesis, diagnosis, treatment and prevention of Streptococcus pneumonia. -Describe microbiological aspects, virulence factors, pathogenesis, diagnosis and treatment of Klebsiella pneumonia. -Describe microbiological aspects, virulence factors, pathogenesis, diagnosis, treatment and prevention of Bacillus anthracis. -Understand microbiological aspects, pathogenesis, resistance, diagnostic approaches, principle of treatment and preventive measures of Mycobacterium tuberculosis.	

		8.Fungal and parasitic causes of RTI	-Be familiar with Atypical mycobacteria and diseases caused by them. -Define atypical pneumonia and list its causative microbial causes. -Describe microbiological aspects, virulence factors, pathogenesis, diagnosis and treatment of Mycoplasma pneumonia. -Describe microbiological aspects, virulence factors, pathogenesis, diagnosis and treatment of of Legionella pneumophila. -Be familiar with Chlamydia psittasi and Coxiella burnetti as causative agents of atypical pneumonia. -List important viral causes of RTI. -Understand structure, antigenic variations, epidemiology, clinical findings, diagnosis, treatment and preventive measures of Influenza viruses. -Understand structure, epidemiology, clinical findings, diagnosis, treatment of Parainfluenza virus. -Describe structure, epidemiology, clinical findings, diagnosis and treatment of RSV. -Understand structure, antigenic types, genetic variation and evolution, epidemiology, clinical findings, diagnosis, treatment and preventive measures of Coronaviruses. -Describe structure, epidemiology, clinical findings, diagnosis and treatment of Adenoviruses. -List fungal and parasitic causes of RTI. -Describe microbiological aspects, pathogenesis, clinical findings, diagnosis and treatment of Histoplasma capsulatum. -Describe microbiological aspects, pathogenesis, clinical findings, diagnosis and treatment of Aspergillus fumigatus. Understand microbiological aspects, life cycle, pathogenesis, clinical findings, diagnosis and treatment of Pneumocystis jirovecii. -Describe morphology, life cycle, pathogenesis, clinical findings, diagnosis and treatment of Paragonimus westermani.	

		Pathology 6.Pulmonary Infections I 7.Pulmonary Infections II	Define pneumonia. - Talk briefly about the different lung defense mechanisms against infection. - Mention the classification of various pneumonia syndromes. - Describe in detail the community acquired acute bacterial pneumonia including the different etiologic organisms (mainly streptococcus pneumonia), pathogenesis, morphology, clinical features, and complications. - Discuss community acquired atypical pneumonia including pathogenesis, morphology, and clinical features. - Talk more in detail about SARS-COV. - Discuss hospital-acquired pneumonia and aspiration pneumonia. -Discuss lung abscess and describe the mechanisms for microorganism introduction, pathologic features, clinical course & complications. - Talk about chronic pneumonia. - Discuss Tuberculosis in detail, including etiology, athogenesis, epidemiology, types, gross and icroscopic features, and complications. -Comment briefly on the morphology of Histoplasmosis, Blastomycosis, and Coccidioidomycosis. -Discuss pneumonia in immunocompromised patients and be familiar with the morphologic features of CMV, PJP, cryptococcosis, candidiasis, and opportunistic molds.	
		Pharmacology 5,6. Treatment of bacterial respiratory infections 7.Treatment of tuberculosis	-Understand the pharmacokinetics, mechanism of action and adverse effects of drugs commonly used in the treatment of pulmonary bacterial infections. -Understand the concepts of TB treatment with special emphasis on two phases of therapy. -Understand the concepts of combination therapy particularly the advantages and disadvantages with special emphasis on TB management. -Describe the mechanisms of action, pharmacokinetics, uses and side effects of Isoniazid, Rifampin, and Ethambutol. In addition, pyrazinamide as first line therapy of tuberculosis.	

	Topic 5: Malignancy (2 Lectures) Pathology: 2	**Pathology** 8.Lung Tumors I 9.Lung tumors II, Pleural Pathology	-Discuss the general facts about lung tumors indicating its clinical impacts. -Discuss the changes in the classification of malignant epithelial lung tumors. -Describe the etiology, pathogenesis, morphology, clinical features, routes of spread and prognosis of lung carcinoma and their precursors. -Mention the diagnostic techniques of lung tumors. -Briefly comment on the role of immunohistochemistry in the diagnosis of lung carcinoma. -Talk in detail about the local and secondary effects of lung carcinoma, including paraneoplastic syndromes. -Describe the patterns of metastatic lung tumors. -Describe the classification of neuroendocrine tumors. -Discuss the morphology and clinical features of carcinoid tumors. - Briefly describe the clinical and morphologic features of pulmonary hamartoma. -Mention the different types of pleural effusion and pleuritis. -Describe pneumothorax, hemothorax and chylothorax. Discuss the etiology, pathogenesis, morphology, clinical presentation, and prognosis of malignant mesothelioma.	
	Topic 6: Epidemiology of Respiratory Diseases. (2 lectures) Community Medicine: 2	**Community Medicine** 1. Acute respiratory diseases 2. chronic respiratory diseases.	-Understand the classification of respiratory diseases. -Describe the global burden of respiratory diseases. -Identify key risk factors associated with respiratory conditions. -Explain epidemiological trends and patterns in respiratory diseases. -Discuss prevention and control strategies. -Analyze emerging respiratory threats and their public health impact.	

	Topic 7: Clinical Lectures (3 lectures) Pediatrics: 1 Radiology: 1 Surgery: 1	1. Approach to respiratory infections in children 2. Radiological modalities in the respiratory system 3. Surgical procedures and approaches in respiratory diseases	- Be familiar with the general approach to infections in children - To be able to read a simple chest x-ray - To be able to diagnose emergency cases - Describe the surgical procedures used commonly in respiratory diseases - Surgical approach to respiratory diseases	
	Practical Sessions	**Anatomy Labs (2):** 1.Anatomy of the Upper respiratory tract And lower respiratory tract 2.Histology of the Respiratory Tract	- Identify the different parts of the external nose, nasal cavity, nasal septum, and nasal walls including conchae and meatuses with their associated openings. - Identify the different parts of the laryngeal skeleton, ligaments and membranes, including the vocal and vestibular folds. - Identify the different parts of the laryngeal cavity and the rima glottidis. - Identify the muscles of the larynx. - Revise surface markings of the larynx and site for emergency tracheostomy. - Identify different parts of the pharynx and the associated structures including the tonsils and comment on their clinical significance - Revise the gross, surface, and radiological anatomy of the trachea. - Identify the different parts of pleura and their recesses. - Identify the different parts of the lung and contrast between right and left lung. - Identify structures entering and leaving the hilum of the lung. - Identify important structural relations of the structures that leave impressions on the right and left lung. - Identify different parts of the bronchial tree. - Identify the radiological appearance of the lungs, trachea, and bronchial tree.	

			- Identify the microscopic structure of the nasal mucosa, larynx, trachea, bronchial tree, and lung	
		Physiology Lab (1): 1.Pulmonary functions tests Spirometry	-Discuss the purpose of performing PFT -Define spirometry and spirogram. -Demonstrate the recording of static lung volumes & identify different lung volumes and capacities measured by spirometer -Draw a normal spirogram, labeling the four lung volumes and four capacities. -Identify which volume and capacities cannot be measured by spirometry. -Indicate the normal values for lung volumes & capacities and describe the effect of age, gender, body height and race on lung volumes -Define the dynamic pulmonary function tests and define FVC, FEV1 and (FEF25–75). -Perform spirometry to determine FVC and FEV1 -Interpret changes in FVC and FEV1 and indicate their value in the diagnosis of obstructive and restrictive lung diseases. -Demonstrate the recording of peak expiratory flow and determine the following from the flow volume curve: PEFR, FEF25% - 75% -Explain how volume flow curves can be used to differentiate obstructive from restrictive respiratory dysfunction. -	
		Pathology Labs (2): 1,2. respiratory diseases	- Describe the morphological features, including the gross and microscopic ones, for the most common and important pathological lesions of the different components of the respiratory system	

		Microbiology Labs (1) 1.Throat swab 2.Sputum culture	-Be familiar with the selection, collection, and transport of specimens for microbiological examination. -Be familiar with the cultivation and isolation of viable pathogens. -List types of media used for throat swab culture. -Identify and describe the type of hemolysis. - Explain the value of using of some biochemical reactions -Be familiar with the selection, collection, and transportation of sputum samples. -Be familiar with the cultivation of acid-fast and nonacid-fast bacteria. -Be familiar with the procedure of Ziehl-Neelsen stain. -Be able to visualize and observe mycobacterium under the microscope. -Be familiar with the Lowenstein-Jensen medium. -Prepare slides from the sputum for staining.	

ACADEMIC SUPPORT

It is The Hashemite University policy to provide educational opportunities that ensure fair, appropriate, and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate for individual's needs.
Special Needs Section: Student Services and Care Unit
Tel:053903333 ext. 4132/ 4583/ 5023
Location: Deanship of Students Affairs
Email: stydent@hu.edu.jo

COURSE REGULATIONS

Participation
Class participation and attendance are important elements of every student's learning experience at The Hashemite University, and the student is expected to attend all classes. If a student is absent **for more than 15%** of the course sessions, then he/she may be liable to fail the course regardless of their performance. It is the students' responsibility to monitor the frequency of their own absences. Attendance record begins on the first day of the course irrespective of the period allotted to

drop/add and late registration. It is a student's responsibility to sign in; failure to do so will result in a non-attendance being recorded.

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a class provided that the number of such occasions does not exceed the limit allowed by the University.

Plagiarism

Plagiarism is considered a serious academic offence and can result in your work losing marks or being failed. HU expects its students to adopt and abide by the highest standards of conduct in their interaction with their professors, peers, and the wider University community. As such, a student is expected not to engage in behaviors that compromise his/her own integrity as well as that of the Hashemite University.

- **Plagiarism includes the following examples, and it applies to all student assignments or submitted work:**

- **Use of the work, ideas, images, or words of someone else without his/her permission or reference to them.**
- **Use of someone else's wording, name, phrase, sentence, paragraph, or essay without using quotation marks.**
- **Misrepresentation of the sources that were used.**

- **The instructor has the right to fail the coursework or deduct marks where plagiarism is detected**

Missed exams:

In all cases of assessment, students who fail to attend an exam on the scheduled date without prior permission and/or are unable to provide an accepted medical note will automatically receive a failing grade for this part of the assessment.

Cheating:

Students who are caught cheating will be reported to the Medical Dean, and further action will be taken as necessary, according to the University Regulations.

Student Complaints Policy

Students at The Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

COURSE ASSESSMENT

Course Calendar and Assessment

Students will be graded through the following means of assessment and their final grade will be calculated from the forms of assessment as listed below with their grade weighting considered.

Assessment	Grade Weighting	Material	Deadline Assessment
Exam 1 (Midterm exam)	40%	TBD	TBD
Exam 2 (Practical)	20%	Practical Labs	TBD
Final exam	40%	Inclusive	TBD

Description of Exams

Test questions will predominantly come from the material presented in the lectures. The exam will consist of multiple-choice questions for the regular exams and short essay questions for makeup exams (for students with accepted excuses, only documented absences will be considered as per HU guidelines).

Quizzes: Unannounced quizzes may be given during or/and at the end of each topic based upon the previous lectures. It will enforce that you come prepared to the class.

- Grades of the MD program are not negotiable and are awarded according to the following criteria

Letter Grade	Description	Grade Points
A+	Excellent	4.00
A		3.75
A-		3.50
B+	Very Good	3.25
B		3.00
B-		2.75
C+	Good	2.50
C		2.25
C-		2.00
D+	Pass	1.75
D	Pass	1.50
F	Fail	0.00
I	Incomplete	-

WEEKLY LECTURE SCHEDULE AND CONTENT DISTRIBUTION

Subject	Number of Lectures	Number of Labs	Lecturers
Anatomy	8	2	Dr. Razan Sartawi
Physiology	9	1	Dr. Zuheir Hasan
Biochemistry	4	-	Dr. Walaa Bayoumi
Pathology	9	2	Dr. Ola Abu Al Karsaneh
Microbiology	8	1	Dr. Hafez Al-momani
Pharmacology	7	-	Dr. Sofian Al Shboul
Community Medicine	2	-	Dr. Lara M. Al-Natour
Clinical lectures	3	-	Dr. Mohammad AL Hourani, Dr. Jehad Fataftah, Dr. Muna Kelani
Clinical Skills	-	2	Dr. Ayman Al Sharo
Total	50	8	

Provided separately