

Department of Respiratory Care

Course Specification of
Respiratory Pathophysiology

Course No. (08 05 870)

2023/2024

XLIV. Course Description:

This course provides a comprehensive overview of the pathophysiological mechanisms underlying respiratory diseases. Students will explore the structural and functional basis of normal respiration, followed by a detailed examination of the cellular and molecular processes involved in the development and progression of various respiratory disorders. The course will cover a wide range of conditions, including acute and chronic respiratory failure, obstructive and restrictive lung diseases, pulmonary vascular diseases, respiratory infections, sleep-related breathing disorders, interstitial lung diseases, lung cancer, occupational respiratory diseases, pleural diseases, cystic fibrosis, and bronchiectasis. Emphasis will be placed on understanding the clinical manifestations, diagnostic criteria, and treatment approaches for each disease.

IV Course Content:

A – Theoretical Aspect: (if any)

S	Units/ Topics List	No. of Weeks	Contact hours	CILOs
1	Embryology, anatomy, and histology of the lung ◦ Stages of lung development (embryonic, pseudoglandular, canalicular, saccular, alveolar) ◦ Gross anatomy of the respiratory system (upper and lower airways, lungs, pleura) ◦ Microscopic anatomy of the respiratory system (epithelium, alveoli, vasculature) ◦ Cellular components of the lung (pneumocytes, fibroblasts, macrophages, etc.) ◦ Defense mechanisms of the respiratory system	1	2	a1
2	Physiology of the respiratory system ◦ Mechanics of breathing (muscles, pressures, lung volumes) ◦ Ventilation and gas exchange (diffusion, perfusion, V/Q mismatch) ◦ Control of breathing (neural and chemical regulation) ◦ Pulmonary circulation and blood flow ◦ Oxygen and carbon dioxide transport	1	2	a3, c1
3	Laboratory techniques to study the cellular and molecular processes of disorders ◦ Types of laboratory tests used in respiratory disease diagnosis (sputum analysis, blood gas analysis, imaging, etc.) ◦ Principles behind common molecular techniques (PCR, gene sequencing, etc.) ◦ Biomarkers of respiratory disease ◦ Limitations and interpretation of laboratory results	1	2	a1, a2

4	Acute respiratory insufficiency	- Definition and types (hypoxemic, hypercapnic) - Causes (pneumonia, ARDS, pulmonary embolism, etc.) - Pathophysiological mechanisms - Clinical manifestations and complications	1	2	a2, b1, c2
5	Pathophysiology of asthma	- Inflammatory and immune responses - Airway hyperresponsiveness - Bronchial remodeling - Clinical phenotypes and triggers	1	2	a2, b1, c2
6	Chronic obstructive pulmonary disease	(1) Emphysema and chronic bronchitis (2) Pathophysiological mechanisms (inflammation, proteolysis, oxidative stress) (3) Risk factors and genetic predisposition (4) Exacerbations and complications	1	2	a2, b1, c2
7	Pulmonary vascular diseases	Pulmonary embolism	1	2	a2, b1

		- Pulmonary hypertension (types and causes) - Cor pulmonale			
8	Mid-Term Exam		1	2	
9	Respiratory infections	- Pneumonia (bacterial, viral, fungal, etc.) - Tuberculosis - Acute bronchitis	1	2	a2, b1, c2
10	Sleep-related breathing disorders	- Obstructive sleep apnea - Central sleep apnea - Hypoventilation syndromes	1	2	a2, b1, c2

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11	Interstitial lung diseases	- Idiopathic pulmonary fibrosis - Sarcoidosis - Hypersensitivity pneumonitis	1	2	a2, a3, b1, c1
12	Lung cancer	- Types (small cell, non-small cell) - Risk factors (smoking, environmental exposures) - Molecular mechanisms of carcinogenesis - Staging and prognosis	1	2	a2, b1, c2
13	Occupational respiratory diseases Diseases of the pleura	- Pneumoconiosis (asbestosis, silicosis, etc.) - Occupational asthma - Hypersensitivity pneumonitis	1	2	a2
14	Cystic fibrosis (mucoviscidosis)	- Genetic basis and inheritance - Pathophysiology of mucus production and clearance - Pulmonary and extrapulmonary manifestations	1	2	a2, b1, b2, c2, d1
15	Bronchiectasis	- Causes (infections, CF, immunodeficiency) - Pathophysiology of airway dilatation and inflammation - Clinical features and management	1	2	a2, b1, b2, d2
16	Final Exam		1	2	-
TOTAL			16	32	-
Number of Weeks /and Units Per Semester			16 weeks	2 Credits	-

B - Practical Aspect: (if any)				
S	Tasks/ Experiments	Number of weeks	contact hours	CILOs
1	Not applicable	-	-	-
TOTAL		-	-	-
Number of Weeks /and Units Per Semester		-	-	-

VI. Teaching strategies of the course:

- 65. Lecture method
- 66. Brainstorming
- 67. Demonstration
- 68. Case study discussions

Schedule of Assessment Tasks for Students during the Semester Theoretical part

Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
Attendance and Activities	15 th week	5	5%	a, b
Student assignment	5 th and 12 th week	5	5%	b
Mid-term exam	7 th or 8 th week	20	20%	a, b
Final exam	16 th -17 th week	70	70 %	a, b, c, d
Total Theory Weight		100	100%	