



Department of Respiratory Care

Course Specification of Respiratory Care Science III Course No. (08 05 871)

2023/2024

LXIV. Course Description:

This course delves deeper into advanced respiratory care practices, focusing on comprehensive assessment techniques, specialized interventions, and therapeutic modalities for diverse patient populations. Students will gain expertise in nutrition assessment and support, cardiopulmonary exercise testing, interventional pulmonary procedures, and advanced respiratory therapies like helium-oxygen, carbon dioxide, and nitric oxide. Additionally, they will explore the principles of polysomnography for sleep disorder diagnosis and management, airway management in challenging scenarios, and the application of high-flow nasal cannula and non-invasive ventilation. The course also addresses the unique respiratory challenges of burn and inhalation injuries, culminating in the application of knowledge and skills through case studies. This course aims to prepare respiratory therapists for the complexities of critical care and specialized patient management.

IV Course Content:

A – Theoretical Aspect: (if any)

S	Units/ Topics List	No. of Weeks	Contact hours	
1	Nutrition Assessment and Support ○ Effects of Nutrition on Respiratory Function and Critical Illness ○ Nutrition Assessment ○ Calculation and Measurement of Energy Requirements ○ Nutritional Support Guidelines	1	2	
2	Cardiopulmonary Exercise Assessment ○ Normal Cardiopulmonary Response to Exercise ○ Incremental Exercise Testing ○ Interpreting the Results of Incremental Cardiopulmonary ○ Exercise Testing ○ Timed Walk Tests ○ Indications for Cardiopulmonary Exercise Testing ○ Safety Issues	2	2	
3	Interventional Pulmonary Procedures ○ Diagnostic Bronchoscopy ○ Patient Selection ○ Patient Preparation ○ Flexible Fiberoptic Bronchoscopy Techniques ○ Complications of Bronchoscopy ○ Indications for Bronchoscopy ○ Therapeutic Bronchoscopy ○ Rigid Bronchoscopy ○ Airway Stenting ○ Pleural Disease ○ Endobronchial Valves	3-5	6	
4	Respiratory Therapeutics ○ Helium–Oxygen Therapy ○ Carbon Dioxide Therapy ○ Nitric Oxide Therapy	6-7	4	
5	Med-term exam	8	2	

6	Polysomnography	- Normal Sleep and Sleep Stages - Polysomnography Components - Scoring Criteria - Polysomnography Report	9	2	
7	Advanced Respiratory Therapeutics	- The Difficult Airway: Assessment and Strategy - Extubation - Tracheostomy - Airway Cuff Concerns	10-11	4	
	High-Flow Nasal Cannula and NIV	- Interfaces for CPAP and NIV - Continuous Positive Airway Pressure - Noninvasive Positive Pressure Ventilation - Sequential Use of NIV and HFNC - Negative Pressure Ventilation, Rocking Beds, and Pneumobelts	12	2	
8	Extracorporeal Life Support for Respiratory Failure	- History of ECMO Use in Respiratory Failure - ECMO Basics - Indications and Contraindications - ECMO Management - ECMO Outcomes - Complications - Technological Advancements	13-14	4	
9	Burn and Inhalation Injury	- Burn Injury - Inhalation Injury - Airway management in Burn Injury	15	2	
		- Management of Inhalation Injury - Case Studies			
16	Final Exam		16	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	
1	<u>Nutritional Assessment Lab:</u> - Practice calculating energy requirements using various formulas(e.g., Harris-Benedict equation). - Perform body composition assessments (e.g., bioelectrical impedance analysis). - Interpret laboratory values relevant to nutritional status (e.g., albumin, prealbumin).	1	2	
2	<u>Enteral and Parenteral Nutrition Lab:</u> - Hands-on practice with inserting and managing nasogastric and orogastric tubes. - Preparation and administration of enteral feeding formulas. - Simulation of parenteral nutrition administration and monitoring.	1	2	
3	<u>Cardiopulmonary Exercise Testing (CPET) Lab:</u> - Perform CPET on healthy volunteers and interpret the results. - Recognize normal and abnormal responses to exercise. - Identify indications for CPET in various patient populations.	1	2	
4	<u>6-Minute Walk Test Lab:</u> - Conduct and interpret the 6-minute walk test in patients with chronic respiratory conditions. - Assess changes in oxygen saturation and perceived exertion during the test.	1	2	

5	Bronchoscopy Simulation Lab: - Practice bronchoscope handling, navigation, and sampling techniques on models or simulators. - Observe and interpret bronchoscopy videos demonstrating normal and abnormal findings. - Discuss indications and potential complications of bronchoscopy.	1	2	
6	Airway Stenting and Pleural Procedures Lab: - Practice airway stent placement and removal on models or simulators. - Observe and interpret imaging studies of airway stents. - Discuss the indications and techniques for pleural procedures (e.g., thoracentesis, chest tube insertion).	1	2	
7	Helium-Oxygen Therapy Lab: - Set up and administer helium-oxygen mixtures using various delivery devices. - Monitor patient response and adjust therapy as needed. - Discuss the rationale and indications for helium-oxygen therapy.	1	2	
8	Nitric Oxide Therapy Lab: - Familiarization with nitric oxide delivery systems. - Simulate the initiation and titration of inhaled nitric oxide therapy. - Monitor for potential side effects and complications.	1	2	
9	Polysomnography (PSG) Setup and Signal Acquisition Lab: - Hands-on practice with PSG equipment setup and sensor placement. - Perform overnight PSG on volunteers and practice signal acquisition. - Identify and correct common artifacts during PSG recording.	1	2	
10	PSG Scoring and Interpretation Lab: - Practice scoring sleep stages, respiratory events, and limb movements on PSG recordings. - Interpret PSG findings to diagnose common sleep disorders. - Write comprehensive sleep study reports based on PSG data and clinical information.	1	2	
11	Difficult Airway Management Lab: Practice advanced airway management techniques (e.g., video laryngoscopy, fiberoptic intubation) on mannequins or simulators. Develop airway management strategies for various difficult airway scenarios.	1	2	
12	High-Flow Nasal Cannula (HFNC) and NIV Lab: Set up and adjust HFNC and NIV devices on mannequins or volunteers. Monitor patient response and titrate therapy as needed. Troubleshoot common problems and complications associated with HFNC and NIV.	1	2	
13	Burn and Inhalation Injury Simulation Lab: Simulate scenarios involving burn and inhalation injuries. Practice airway management techniques in burn patients (e.g., early intubation). Apply specific respiratory care protocols for inhalation injuries.	1	2	
14	Extracorporeal Membrane Oxygenation (ECMO) Simulation Lab: Familiarization with ECMO circuits and components. Simulate the initiation, management, and weaning of ECMO therapy. Discuss indications, contraindications, and complications of ECMO.	1	2	

15	Final lab- Exam	1	2	
TOTAL		15	30	-
Number of Weeks /and Units Per Semester		15 weeks	1 Credits	-

VI. Teaching strategies of the course:

91.Lecture method 92.Practical
Evaluation 93.Physical
Assessment 94.Clinical exam
95.Brainstorming
96.Demonstration
97.Case study discussions

Schedule of Assessment Tasks for Students during the Semester Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	
1	Attendance and Activities	15 th week	5	5%	
2	Student assignment	5 th and 12 th week	5	5%	
3	Mid-term exam	7 th or 8 th week	10	10%	
4	Final exam	16 th -17 th week	40	40 %	
Total Theory Weight			60	60%	

Practical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	
1	Attendance and Attitude	14 th week	5	5%	
2	Semester work	1 st and 14 th week	10	10%	

3	Case report	13 th -14 th week	5	5%	
4	Final exam (Practical)	15 th week	20	20%	
Total Practical Weight			40	40%	