

Department of Respiratory Care

Course Specification of
Basic Mechanical Ventilation

Course No. (08 05 874)2024/2025

XXXVI. Course Description:

This course provides a foundational understanding of mechanical ventilation, a life-saving intervention used to support or replace spontaneous breathing in critically ill patients. Students will delve into the principles of mechanical ventilation, exploring the indications, different modes of ventilation, ventilator settings, and monitoring techniques. The course will emphasize the safe and effective initiation, management, and weaning of mechanical ventilation, with a focus on recognizing and managing complications. Additionally, students will gain practical skills in ventilator operation, troubleshooting, and patient assessment.

IV Course Content:

A – Theoretical Aspect: (if any)

S	Topics List	Subtopics List	No. of Weeks	Contact hours	CILOs
1	<u>Respiratory Physiology Review</u>	o Mechanics of breathing, gas exchange, lung volumes, acid-basebalance	1	2	
2	<u>Introduction to Mechanical Ventilation</u>	o History, indications, contraindications, types of ventilators o Basic Terms and Concepts of Mechanical Ventilation, o How Ventilators Work, o How a Breath Is Delivered	2	2	
3	<u>Ventilator Modes: Volume Control</u>	o Principles, settings (VT, RR, FiO ₂ , PEEP), indications, complications	3	2	
4	<u>Ventilator Modes: Pressure Control</u>	o Principles, settings (PC, RR, FiO ₂ , PEEP), indications, complications	4	2	
5	<u>Ventilator Modes</u>	o SIMV, PSV, PRVC, APRV, NIV, HFOV	5	2	
6	<u>Initial Ventilator Setup and Management</u>	o Assessment, setting initial parameters, monitoring	6-7	4	
7	<u>Med-term exam</u>		8	2	
8	<u>Ventilator Waveforms and Graphics</u>	Pressure-time, flow-time, volume-time curves, loops	9	2	
9	<u>Mechanical Ventilation in Specific Conditions</u>	o ARDS, COPD, asthma, pneumonia	10	2	
10	<u>Ventilator-Associated Complications</u>	o VAP, barotrauma, oxygen toxicity, hemodynamic effects	11	2	
11	<u>Weaning from Mechanical Ventilation</u>	o Readiness criteria, weaning protocols, troubleshooting	12	2	
12	<u>Troubleshooting Ventilator Alarms</u>	o High pressure, low pressure, apnea, disconnection o Ventilator Cleaning and Disinfection	13	2	
13	<u>Pediatric and Neonatal Ventilation</u>	o Unique considerations, ventilator settings	14	2	
14	<u>Noninvasive Ventilation (NIV)</u>	o CPAP, BiPAP, indications, contraindications o Ventilator Management in Case Scenarios	15	2	
15	<u>Final lab- Exam</u>		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	Lab 1: Ventilator Orientation and Safety • Equipment familiarization, safety protocols	1	2	
2	Lab 2: Ventilator Setup and Initiation • Hands-on practice with setting initial parameters	1	2	
3	Lab 3: Volume Control Ventilation • Adjusting VT, RR, FiO ₂ , PEEP on a simulator/patient	1	2	
4	Lab 4: Pressure Control Ventilation • Adjusting PC, RR, FiO ₂ , PEEP on a simulator/patient	1	2	
5	Lab 5: SIMV and PSV Modes • Practicing spontaneous breaths with support modes	1	2	
6	Lab 6: Waveform Interpretation and Analysis • Identifying normal and abnormal waveforms on a simulator/patient	1	2	
7	Lab 7: Troubleshooting Common Alarms • Hands-on practice resolving alarms on a simulator/ventilator	1	2	
8	Lab 8: Ventilator Circuit Changes and Suctioning • Sterile technique practice • Ventilator Cleaning and Disinfection • Infection control practices for ventilator equipment	1	2	
9	Lab 9: Weaning Simulation • Gradual reduction of support, monitoring for readiness	1	2	
10	Lab 10: Arterial Blood Gas (ABG) Interpretation • Correlating ABG values with ventilator settings	1	2	
11	Lab 11: Ventilator Management in Case Scenarios 1. Simulated patient cases with varying conditions.	1	4	
12	Lab 12: Pediatric and Neonatal Ventilator Setup • Hands-on practice with specialized equipment.	1	2	
13	Lab 13: Noninvasive Ventilation (NIV) Setup • Mask fitting, pressure adjustments on a simulator/patient	1	2	
14	Lab 14: Case Studies • Continue with complex case studies, emphasizing critical thinking and assessment skills.	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:

51.Lecture method 52.Practical
Evaluation 53.Physical
Assessment 54.Clinical exam
55.Brainstorming
56.Demonstration
57.Case study discussions

Schedule of Assessment Tasks for Students during the Semester Theoretical part

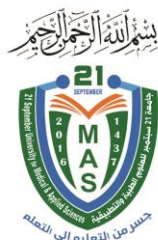
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	
1	Attendance and Activities	15 th week	5	5%	
2	Student assignment	5 th and 12 th week	5	5%	
3	Mid-term exam	7 th or 8 th week	10	10%	
4	Final exam	16 th -17 th week	40	40 %	
Total Theory Weight			60	60%	

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%	

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FOR MEDICAL & APPLIED SCIENCES

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