



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817116
Course Title	Pathophysiology for respiratory therapist
Credit Hours	(3)
Theoretical Hours	(3)
Practical Hours	(0)



Course description:

This course provides an in-depth study of human pathological processes and their effects on homeostasis. Associated pathologies of the body systems that have an impact on the respiratory care are explored. This course focuses on Alteration in Fluids and Electrolytes and Disorders of homeostasis and The Red Blood Cell & Alteration in Oxygenation Transport and Disorders of white blood cells and lymphoid tissue and Alteration in Blood Flow and Alteration in Blood Pressure and Alteration in Cardiac Function, Heart Failure & Circulatory Shock and Alteration in Respiratory Function and Renal Failure

Course objectives:

Intended Learning Outcomes

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

Acquire knowledge and understanding of the pathophysiology of selected body disorders.

Define pathophysiology and its importance for professional health students.

Describe the most known body dysfunctions and their impact on respiratory care.

Recognize the physiological changes that occur due to external and internal environmental Stresses, pathological processes and the response that produces signs and symptoms.

B. Intellectual skills

Interpret a variety of concepts in pathology which will be utilized in decision-making and actions related to other respiratory care courses.

C. Subject specific skills

Interpret flowcharts of pathophysiological data.

D. Transferable skills

Develop a vocabulary of appropriate terminology to effectively communicate information related to pathophysiology.



Course outline:

Unit No.	Unit name	Unit Content	Time
1	Introduction	What is pathophysiology The significance of pathophysiology for health professionals	
2	Alteration in Fluids and Electrolytes	_Alteration in fluids and electrolytes (DI, SIADH). _Edema _Acid- base imbalances	
3	Disorders of hemostasis	Hypercoagulability, thrombosis Thrombocytosis, thrombocytopenia	
4	The Red Blood Cell & Alteration in Oxygenation Transport	Anemia and its causes Mechanisms and symptoms of anemia	
5	Disorders of white blood cells and lymphoid tissue	Leukopenia, neutropenia Leukemia Lymphomas	
6	Alteration in Blood Flow	Atherosclerosis and its pathogenesis Peripheral vascular disease Pathophysiology of pressure ulcers	
7	Alteration in Blood Pressure	Risk factors for hypertension Classifications of hypertension Uncontrolled BP Orthostatic hypotension	
8	Alteration in Cardiac Function, Heart Failure & Circulatory Shock	Disorders of the heart pericarditis, pericardial effusion, cardiac tamponade coronary artery disease cardiomyopathy infective endocarditis rheumatic heart disease valvular heart disease (stenosis,regurgitation) Heart failure Circulatory shock	
9	Alteration in Respiratory Function	Pathophysiology ofRespiratory tract infections: influenza pneumonias tuberculosis	

		Respiratory system disorders: pleural effusion, pneumothorax, hemothorax, empyema, emphysema atelectasis bronchial asthma and COPD, chronic bronchitis pulmonary embolism, Pulmonary hypertension, pulmonary oedema, Acute Respiratory Failure Neoplastic disorders of the lungs	
10	Renal Failure	Renal failure	

Teaching Methodology:

Lectures, group discussion, videos, live patterns & samples, practical applications, fieldvisits (industries).



Evaluation Strategies:

Exams	Percentage	Date
Midterm Exam	40%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	10%	
Total	100%	

References:

Applied Respiratory Pathophysiology, Louis-Philippe Boulet, (2017). 1st edition, CRC Press

Pathophysiology: concepts of altered health states, Porth, C. (2013). (9thed.) Philadelphia, J.B Lippincott

Pathophysiology: A Practical Approach, 2nd ed. Story, L. (2017). Burlington, MA: Jones & Bartlett Learning

Understanding pathophysiology. Huether S and McCance K (2016) (6th edition). St. Louis, Mosby.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817114
Course Title	Anatomy for respiratory therapist
Credit Hours	(3)
Theoretical Hours	(2)
Practical Hours	(3)



Course description

This course presents a systematic approach to the study of the human body for the respiratory therapy students. It develops a basic understanding of the structure of body organs and systems and The cells and tissues of the body Blood, and blood vessels · The Cardiovascular system· The Respiratory System Lymph System· The nervous System and Urinary System. The laboratory component parallels and reinforces theoretical concepts through the use of models.

Course objectives :

Intended Learning Outcomes

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

Define anatomy

Acquire knowledge and understanding of the structures of the body systems.

Describe the body organs, their locations, compositions, and specific characteristics and interaction with respiratory system.

B. Intellectual skills

Interpret normal and abnormal anatomy.

Use anatomical knowledge to predict physiological consequences.

C. Subject specific skills

Synthesize ideas to make a connection between knowledge of anatomy and physiology and real-world situations, including healthy lifestyle decisions.

Interpret graphs of anatomical data.

D. Transferable skills

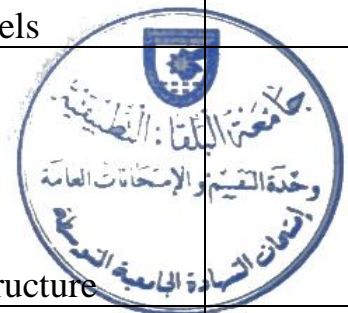
Develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy.

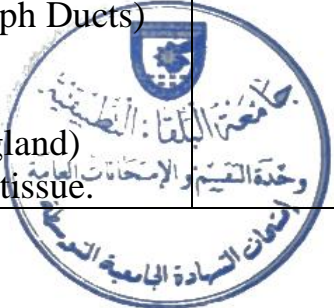
Integrate the anatomy of the body with its physiology.



Course outline:

Unit No.	Unit name	Unit Content	Time
1	Introduction to medical terminology	Discuss the four parts of medical terms Identify the most common prefixes and suffixes. Studying the methods of word buildings Abbreviations related to time, location, and number Abbreviations related to anatomical position, directional terms, body regions, planes and cavities)	
2	Introduction to the human body	Definition of Anatomy Levels of Body Organization Body Systems and their Organs	
3	The cells and tissues of the body	Structure of the cell: The cell membrane The cytoplasm and cell organelles The nucleus Body tissues (Epithelium, Connective, Muscular, Nervous) Membranes of the body	
4	Blood, and blood vessels	Blood Composition of blood: Plasma Erythrocytes(red blood cells) Leukocytes(white blood cells) Thrombocytes (platelets) Blood groups Blood Vessels: Types of blood vessels. Structure of blood vessels. Major Blood Vessels – Circulatory routes of blood vessels	
4	The Cardiovascular system	Heart: Size and location Structure Flow of blood through the heart Blood supply to the heart Conducting system of the heart structure	
5	The Respiratory	Structure of the upper respiratory tract	



System		<p>Nose and Nasal Cavity, nasal bones, cartilages, nasal septum, turbinates Oral cavity, vestibule, palates, tonsils (naso-, oro-, laryngo-) Pharynx, Larynx, cartilages, epiglottis, vocal cords the Trachea Structure of the lower respiratory tract Bronchi and smaller air passages Respiratory bronchioles Alveoli, alveolar ducts, sacs and cells, surfactant, alveolar macrophages Components of the mediastinum Pleura and pleural membrane Lungs: (Position, Structure, lobes and segments, fissures) The components of the bony thorax Thoracicvertebrae, Sternum, (Manubrium, Body, Xiphoid process) True ribs, False ribs, Floating ribs Diaphragm, phrenic nerve Muscles of inspiration (Scalene muscles, Sternocleidomastoid muscles, Pectoralis major muscles, Trapezius muscles, External intercostal muscles. Musclesof expiration (Rectus abdominis muscles, External abdominis obliquus muscles, Internal abdominis obliquus muscles, Transversus abdominis muscles, Internal intercostal muscles).</p>	
Lymph System		<p>Lymph and Lymph vessels Juxta-alveolar lymphatic vessels Lymph nodes(Structure) Thoracic Duct (Right and left Lymph Ducts) Lymphatic Organs and Tissue Spleen Thymus gland (also an endocrine gland) Mucosa-associated with lymphoid tissue.</p>	

6	The nervous System	Autonomic nervous system - Sympathetic nervous system (Neural transmitters, Epinephrine, Norepinephrine, Receptors) - Parasympathetic nervous system (Neural transmitters)	
7	Urinary System	Structures of the urinary organs: The kidneys The ureters Urinary bladder and urethra	

Teaching Methodology:

Lectures, slides and posters, computers, models, coloring sheets, activities.

Evaluation Strategies:

Exams	Percentage	Date
Midterm Exam	٥٠%	--/--/----
Final Exam	50%	--/--/----
Total	100%	

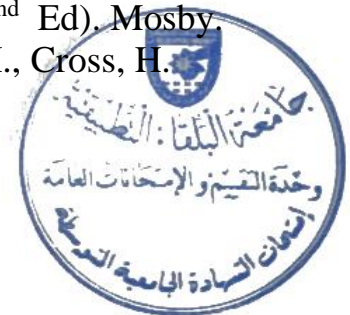
References:

Cardiopulmonary Anatomy & Physiology: Essentials of Respiratory Care, 7th Edition. Terry Des Jardins(2020).

Fundamentals of Anatomy and Physiology: For Nursing and Healthcare Students (2nd Ed). Peate, I. & Nair, M. (2017). Wiley

Mosby's Anatomy and Physiology Coloring Book (2014), (2nd Ed). Mosby.

Essential Medical Terminology, Stanfield, P. S., Hui, Y. H., Cross, H. (2015). Jones and Bartlett learning.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817115
Course Title	Physiology for respiratory therapist
Credit Hours	(3)
Theoretical Hours	(3)
Practical Hours	(0)



Course description:

This comprehensive course provides the students with an understanding of the functions performed by the various parts and organs of the human body. Physiology mechanisms of body The body as a Whole The Tissue Blood and Cardiovascular System, Blood and Cardiovascular System, Respiratory System, Acid Base Balance, Disorders of H⁺ Concentration, Nervous System and Urinary System.

Course objectives :

Intended Learning Outcomes

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

Acquire knowledge and understanding of the functions and the mechanisms of the body systems and organs.

Define physiology and its importance in homeostasis.

Describe the integration of body organs functions' to enhance respiratory system functions .

B. Intellectual skills

Interpret normal and abnormal physiology.

Match anatomical knowledge with the physiological functions.

C. Subject specific skills

Synthesize ideas to make a connection between knowledge of anatomy and physiology and real-world situations, including healthy lifestyle decisions.

Interpret graphs of physiological data.

D. Transferable skills

Develop a vocabulary of appropriate terminology to effectively communicate information related to physiology.

Integrate the anatomy of the body with its physiology.



Course outline:

Unit No.	Unit name	Unit Content	Time
1	The body as a Whole	Define physiology Homeostasis Intercellular fluid Extracellular fluid (and its Components) Interstitial fluid Na ⁺ & water balance	
2	The Tissue	Cell division Physiology of the cell Movement of substances through the cell membrane: (Diffusion, osmosis, active and passive transport) General functions of body tissues (Epithelium, Connective, Muscular, Nervous) Tissue regeneration	
3	Blood and Cardiovascular System	Functions of the Circulatory System Functions of blood component Heart functions – Cardiac cycle – Cardiac output – Blood pressure	
4	Respiratory System	Functions of the organs of the respiratory system Upper airway functions Nose, larynx and Pharynx Function of the sites of gas exchange (bronchioles, alveolar ducts, and sacs, lobules) Elastic properties of the lungs and chest wall, lung compliance Diaphragm Pleura Ventilation, and its types Surface tension, airway resistance Alveolar ventilation/ dead space ventilation Physiology of respiration: – Control of Respiration – Function of the accessory muscles	

5	Acid Base Balance	<ul style="list-style-type: none"> ● Introduction ● The Hydrogen Ion (H⁺) and pH ● Acids, Bases and Buffers ● The Importance of H⁺ Concentration ● Production of H⁺ 	
	Disorders of H ⁺ Concentration	<ul style="list-style-type: none"> ● Respiratory Acidosis ● Respiratory Alkalosis ● Metabolic Acidosis ● Metabolic Alkalosis Compensation	
6	Nervous System	Acetylcholine Effect of ANS on the neural control of the lungs. Effects of the sympathetic and parasympathetic nervous systems on: Heart, Bronchial smooth muscle, Bronchial glands, Salivary glands, Stomach, Intestines, Eye	
7	Lymphatic System	Functions of lymphatic system Function of Lymphatic system vessels and nodes, juxta-alveolar lymphatic vessels Functions of the lymphatic glands (spleen, thymus)	
8	Urinary System	Functions of the urinary organs: The kidneys The ureters Urinary bladder and urethra	

Teaching Methodology:

lectures, discussion, homework's, demonstrations/ videos/ animations, activities, coloring sheets.

Evaluation Strategies:

Exams	Percentage	Date
Midterm Exam	40%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	10%	
Total	100%	



References:

Cardiopulmonary Anatomy & Physiology: Essentials of Respiratory Care, 7th Edition, Terry Des Jardins(2020).

Fundamentals of Anatomy and Physiology: For Nursing and Healthcare Students. Peate, I. & Nair, M. (2017). (2nd Ed). Wiley

1. **Core concepts in the disorders of fluid, electrolytes and acid-base balance**, Sands, Jeff; Mount, David; Sayegh, Mohamed; Singh, Ajay. 2013. Springer.

Mosby's Anatomy and Physiology Coloring Book (2014), (2nd Ed). Mosby.

Essential Medical Terminology, Stanfield, P. S., Hui, Y. H., Cross, H. (2015). Jones and Bartlett learning.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	٠٢٠٨١٧١١١
Course Title	Fundamentals of respiratory care
Credit Hours	(٢)
Theoretical Hours	(١)
Practical Hours	(٣)



Course Description:

This course introduces the respiratory therapist student to the fundamental knowledge needed to perform safe and effective respiratory care. It emphasizes on legal and ethical issues, interpersonal communication, critical thinking, Vital signs , Sleep, Nutrition, Pre/post-operative Care and safety as foundational concepts for the provision of essential skills for Respiratory Therapist .

Course Objectives:

Intended Learning Outcomes

Upon the completion of the course, the student will be able to:

A. Knowledge & Understanding

1. Define respiratory care, quality, credentialing, professionalism.
2. Value the development of the respiratory therapy
3. Understand the competencies needed to be achieved by the respiratory therapist.
4. Understand the elements of monitoring and delivering quality to promote better patient outcomes.
5. Understand evidence-based medicine.
6. State how communication can affect patient care.
7. List the factors associated with the communication process.
8. List the common components of a medical record.
9. State the legal and practical obligations involved in recordkeeping.
10. Identify RT responsibilities in managing perioperative clients.
11. Understand the techniques of measuring the different vital signs.

B. Intellectual skills

1. Explain how respiratory care protocols improve the quality of respiratory care services.
2. Describe how professional codes of ethics apply to ethical decision making and thus resolving ethical dilemmas.
3. Describe the principles underlying effective recording and reporting/ documenting interventions.
4. Explain how a respiratory therapist can become liable for wrongful acts.
5. Describe how to apply good body mechanics and posture to moving patients.
6. Describe how to ambulate a patient and the potential benefits of ambulation.
7. Describe essential steps for safely administering medications.



C. Subject specific skills

1. Develop an awareness concerning the role of RT.
2. Being able to recognize and help resolve interpersonal or organizational sources of conflict.
3. Being able to achieve the competencies of RT in a safe, high quality environment.

Course outline:

Unit #	Unit Name	Unit content	Time
1.	Foundations of respiratory care	<ul style="list-style-type: none"> - Definitions - Brief history of RT - Development of the respiratory care profession - Changes expected in respiratory care - Major competencies required by RT 	
2.	Delivering Evidence-Based Respiratory Care	<ul style="list-style-type: none"> - Credentialing - Professionalism and professional characteristics of a RT - Medical and technical direction - Quality - Monitoring quality in respiratory care 	
3.	Communication in Health Care	<ul style="list-style-type: none"> - Components - Purposes - Factors affecting communication - Improving communication skills - Feedback - Minimizing communication barriers 	
4.	Recordkeeping	<ul style="list-style-type: none"> • Components of a traditional medical record • Legal aspects of recordkeeping • General rules for medical recordkeeping • Electronic records (Hakeem) • Respiratory checklists and formats 	
5.	Ethical and Legal Implications of Practice	<ul style="list-style-type: none"> • Codes of ethics • Ethical dilemmas • Respiratory care statement of ethics and professional conduct • Legal issues affecting respiratory care • Professional licensure 	

6.	Vital signs	<ul style="list-style-type: none"> • Time to assess vital signs. • variations in normal vital signs by age. • Assessing vital signs: <ul style="list-style-type: none"> ▪ Body temperature ▪ Pulse ▪ Respiration ▪ Blood pressure ▪ Pain assessment 	
7.	Safety and protection	<ul style="list-style-type: none"> ▪ Factors affecting safety ▪ Preventing specific hazards. <ul style="list-style-type: none"> – Burns. – Fires. – Falls. – Suffocation or choking. – Electrical hazards. 	
8.	Medications	<p>Types of drug preparation Legal aspects of drug administration. Routes of administration.</p> <ul style="list-style-type: none"> ▪ The steps of safe administration of medication 	
9.	Activity and Exercise	<ul style="list-style-type: none"> • Patient movement and ambulation • Basic body mechanics • Moving the patient in bed • Transferring clients • Effect of immobility • Pressure ulcer. <ul style="list-style-type: none"> – Etiology and Risk factors. – Common pressure site. 	
10.	Sleep	<ul style="list-style-type: none"> • Physiology of sleep. • Stages of sleep. • Sleep cycle. • Function of sleep. • Normal sleep patterns and requirements 	



11.	Nutrition	<ul style="list-style-type: none"> • Essential nutrients • Energy balance. • Body weight and body mass standards. • Factors affecting nutrition throughout the life cycle. • Nutrition assessment 	
12.	Pre/post-operative care	<ul style="list-style-type: none"> • Phases of the perioperative period. • Preoperative assessment of the pulmonary patient • Pre-operative teaching. • Postoperative pulmonary care 	

Teaching Methodology:

Lecture, discussion, simulation, videos, animations, assignments.

Evaluation Strategies:

Exams	Percentage	Date
Midterm Exam	٥٠%	--/--/----
Final Exam	50%	--/--/----
Total	100%	

References:

1. **Egan's fundamentals of respiratory care**, Kacmarek, R., Stoller, J., Heuer, A. 11th edition, 2017. Elsevier
2. **Respiratory care made incredibly easy**. Rose Knapp. 2nd edition. 2018. Wolters Kluwer.
3. **Respiratory Care: Principles and Practice**. Dean R. Hess, Neil R. MacIntyre, William F. Galvin, Shelley C. Mishoe. 3rd Edition, 2016. Jones and Bartlett.
4. **Respiratory notes: respiratory therapist's pocket guide**, Gary C. White. 2nd edition. 2012. F. A. Davis Company: Philadelphia
5. **Kozier&Erb's Fundamentals of Nursing**. Audrey T Berman, Shirlee Snyder, GERALYN FRANDSEN. Prentice Hall. 2015



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817122
Course Title	Respiratory Assessment
Credit Hours	(2)
Theoretical Hours	(0)
Practical Hours	(6)



Course description

This course is designed to provide the respiratory therapist student with technical skills to perform health and physical assessment that contributes significantly to the care of patients with respiratory problems. It allows the student to conduct a comprehensive history and a patient's pulmonary history and health patterns, respiratory diagnostic studies. Respiratory Assessment of the Pediatric Patient and adult This information will enable the student to implement the most appropriate pulmonary nursing interventions resulting in optimal health outcomes for the patient.

Course objectives:**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

1. Identify the major items found in a patient history.
2. Recognize the principle structures of respiratory system and relate every structure to its function.
3. Use the four major components (inspection, palpation, percussion, and auscultation) associated with the systemic examination of the chest and lungs.
4. Differentiate between the normal and abnormal assessment findings of chest inspection, palpation, percussion and auscultation.
5. Differentiate among the sounds heard and felt on percussion (flat sound, dull sound, hyperresonant sound, and tympanic sound)
6. Differentiate between normal and abnormal sputum production.
7. Describe the diagnostic value of the different chest radiographs
8. Perform the primary tasks performed during the patient interview.
9. Differentiate between the abnormal findings among adults, pediatrics and elderly.
10. Interpret the different diagnostic radiographs.



Course outline:

Unit #	Unit Name	Unit content	Time
1	Introduction	<ul style="list-style-type: none"> - The assessment process, purposes and types - Specific components of the assessment process 	
2	The patient interview	<ul style="list-style-type: none"> - Patient history - Patient interview - Chief complaint and history of present illness: <ul style="list-style-type: none"> ● Fever ● Dyspnea ● Chest Pain ● Sputum Production - Major Components of clinical history: <ul style="list-style-type: none"> ● Past Medical History ● Family History ● Personal and Social History 	
3	Systematic Examination of the chest and lungs	<ul style="list-style-type: none"> - Thoracic cage landmarks - Imaginary lines - Lung borders and fissures - Inspection <ul style="list-style-type: none"> ● Altered skin color (Cyanosis) ● Patient's Posture (tripod position, intercostal retraction, nasal flaring). ● Position of the Trachea. ● Respiratory Rate. ● Abnormal ventilator patterns findings ● The Anterior-Posterior Diameter of the Chest. ● Chest Deformities and Scars. ● Depth of Respiration. - Palpation: <ul style="list-style-type: none"> ● Palpating chest expansion. ● Palpating the trachea. ● Normal and abnormal chest (Barrel, Kyphosis) ● Tactile and vocal fremitus. - Percussion <ul style="list-style-type: none"> ● Percussing the thorax (Posterior, Anterior thorax). ● Description of percussion sounds associated with various respiratory pathologies. ● Diaphragmatic expansion. - Auscultation 	

		<ul style="list-style-type: none"> ● Characteristics of Breath Sounds. ● Vesicular breath sounds ● Bronchovesicular breath sounds. ● Bronchial breath sounds. ● Tracheal breath sounds. ● Assessing crackles, loudness, pitch, duration, amount, location, and timing in the respiratory cycle. 	
4	Preparation and interpretation of Respiratory studies	Cough	
		_ Normal and abnormal Sputum production	
		- Productive and nonproductive cough	
		<ul style="list-style-type: none"> ● oxygen saturation(pulse oximetry) ● Arterial Blood Gases ABG'S. ● Mixed Venous Oxygen Saturation. 	
		<ul style="list-style-type: none"> ● Chest radiographs - Inspecting the chest radiograph - Sequence of examination ● Bronchoscopy. ● Pulmonary Angiography. 	
		Other Respiratory Diagnostic Studies <ul style="list-style-type: none"> ● Sputum Culture. ● Pulmonary function Tests. ● Thoracentesis. ● Ventilation –perfusion scanning 	
5	Respiratory Assessment of the Pediatric Patient	<ul style="list-style-type: none"> ● Respiratory rate. ● Sounds ; resonance, Hyper resonance, Harshness, Wheezes, stridor, Snoring, Rattle, grunting, snuffles ● Intercostal musculature. ● Bronchovesicular/ vesicular breath sounds. 	
6	Respiratory Assessment of the Older Adult	<ul style="list-style-type: none"> ● Ability to breath. ● Hyperresonance. ● Chest wall expansion. ● Respiratory muscles. ● Use of accessory muscles secondary to calcification of rib articulations. ● Subcutaneous tissue. ● Abnormal chest (Dorsal curvature, Kyphosis). 	

Teaching Methodology:

Lab scenarios, simulations, discussions, seminars, videos, animations, cases.

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	٣٠%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	٢٠%	
Total	100%	

References:

- 1- **Wilkins' clinical assessment in respiratory care.** AlHeuer, Albert; Scanlan, Craig. 8th edition. 2017. Mosby.
 - 2- **Respiratory Care: Patient Assessment and Care Plan Development.** David Shelledy, and Jay, Peters. 2016. Jones and Bartlett.
 - 3- **Clinical manifestations and assessment of respiratory disease,** Des Jardins, Terry & Burton, George, 7th edition, 2015. ELSEVIER
 - 4- **Handbook of respiratory care.** Chatburn, Robert; Mircles, Edwardo, 2011. 3rd edition. Jones and Bartlett.
 - 5- **Clinically oriented pulmonary imaging –** Sirajuddin, Arlene, Kanne, Geffery 2012. Humana press.
 - 6- **Fundamentals of respiratory sounds and analysis,** Moussavi, Zahra. 2006. Morgan and claypool.
- Related articles from Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817223
Course Title	Adult diseases (2)
Credit Hours	(3)
Theoretical Hours	(1)
Practical Hours	(6)



Course description

The course is designed to provide Respiratory Therapy student with knowledge and skills regarding the common respiratory disorders, **like** Pneumonia, Pleural Effusion and emphysema , Pneumothorax, Pulmonary Embolism ,Pulmonary hypertension, Pulmonary edema, Chronic Obstructive Pulmonary Disease COPD ,Chronic Bronchitis, Acute Asthma, Acute Respiratory Failure, Tuberculosis, Influenza, Neoplastic disorders of the lungs.

Course objectives:**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

1. Identify the etiology of the common respiratory disorders
2. List the clinical manifestations associated with the common respiratory disorders.
3. Identify the management of selected pulmonary disorders.
4. Be familiar with the medical, pharmacological, and surgical management of common respiratory disorders.
5. List the classification of both tuberculosis TB and influenza.

B. Intellectual skills

1. Explain the signs and symptoms of selected pulmonary disorders.
2. Explain various laboratory and diagnostic tests performed in the common respiratory disorders.
3. Compare between obstructive and restrictive pulmonary disease

C. Subject specific skills

1. being able to deal with the different respiratory disorders.



Course outline:

Unit #	Unit Name	Unit content	Time
1	Pneumonia	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	
2	Pleural Effusion and empyema	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	
3	Pneumothorax	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	
4	Pulmonary Embolism	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	
5	Pulmonary hypertension	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	
6	Pulmonary edema	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	
7	Chronic Obstructive Pulmonary Disease COPD	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	
8	Chronic Bronchitis	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	

9	Emphysema	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	
10	Acute Asthma	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention • Status Asthmatics 	
11	Acute Respiratory Failure	<ul style="list-style-type: none"> • Etiology • Assessment • Management • Prevention 	
12	Tuberculosis	<ul style="list-style-type: none"> • Etiology • Classification • Assessment • Management • Prevention 	
13	Influenza	<ul style="list-style-type: none"> • Etiology • Classification • Assessment • Management • Prevention 	
14	Neoplastic disorders of the lungs	<ul style="list-style-type: none"> • Etiology • Assessment • Management and Prevention 	

Teaching Methodology:

Discussions and lecture presentations, videos, animations, cases.

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	٥٠%	--/--/----
Final Exam	50%	--/--/----
Total	100%	



References:

1. **Respiratory disorders sourcebook, Health Reference Series.** Edited by Keith Jones. 4th edition. 2016.Omnigraphics.
2. **Respiratory Care: Principles and Practice,** 3rd Edition. Dean R. Hess, Neil R. MacIntyre, William F. Galvin, Shelley C. Mishoe. 2016. Jones and Bartlett.
3. **Clinical manifestations and assessment of respiratory disease.** Des Jardins, Terry & Burton, George, 7th edition, 2015. ELSEVIER
4. **Principles of airway management.** Brendan T. Finucane, Ban C.H. Tsui, Albert H. Santora, 2011. Springer
5. **Respiratory system and artificial ventilation** - Umberto Lucangelo, et al.2008. springer
 - Related articles form Nursing and Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817123
Course Title	Respiratory management (1)
Credit Hours	(2)
Theoretical Hours	(2)
Practical Hours	(0)



Course description:

The course is designed to provide the respiratory therapist student with knowledge and skills for providing safe and effective airway maintenance. This course's emphasis is placed on areas of practice related to bronchial hygiene, airway management, chest tubes, O2 therapy, chest physiotherapy since establishing and maintaining a secure and patent airway is key in the Respiratory Therapist future role.

Course objectives :**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

1. Identify the indications and complications of orotracheal and nasotracheal intubation
2. List the situations in which chest physiotherapy is either useful or contraindicated.
3. Identify the indication and complication of administration oxygen
4. Identify the principles governing chest tube drainage systems.
5. Summarize strategies to maximize oxygen delivery.

B. Intellectual skills

1. Compare and contrast indications for, and complications of orotracheal intubation and nasotracheal intubation
2. Compare and contrast situations in which chest physiotherapy (including postural drainage) is useful and those in which it is contraindicated.
3. Compare and contrast the principles governing chest tube drainage systems.
4. Compare and contrast the advantages and disadvantages of tracheotomy versus endotracheal intubation
5. Discuss the clinical indications and other related respiratory therapy implications for procedures.

C. Subject specific skills

1. Assess and follow patients on oxygen therapy.
2. Perform chest physiotherapy
3. Care for chest tube drainage
4. Manage the airway effectively



Course outline:

Unit No	Unit Name	Unit content	Time
1	Chest physical therapy CPT	<ul style="list-style-type: none"> ● Definition ● Purpose ● Precautions ● Turning ● Coughing ● Deep breathing ● Types of CPT (Postural drainage, Percussion, Vibration) ● Contraindication 	
2	Airway management	<ul style="list-style-type: none"> ● Suctioning ● Bag-valve mask ventilation ● Laryngeal mask airway ● Naso/ oropharyngeal masks ● Tracheal intubation ● Tracheostomy care 	
3	Oxygen therapy	<ul style="list-style-type: none"> ● Definition, Indications, Complications of oxygen therapy ● Oxygen saturation ● Oxygen sources and delivery <ul style="list-style-type: none"> ○ Low-flow systems devices ○ High-flow systems devices ● Limitations of Oxygen Delivery ● Assessment of Outcome ● Monitoring: <ul style="list-style-type: none"> ○ Frequency ○ Infection Control ○ Related devices ○ Negative effects 	
4	Chest Tubes	<ul style="list-style-type: none"> ● Physiological Principles ● Assessment and Management ● Drainage System ● Suction ● Equipment ● Chest Tube Placement <ul style="list-style-type: none"> ● Drainage Monitoring ● Water-Seal Monitoring ● Positioning ● Complications 	

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|--|---|--|
| | ● Transporting Patient with Chest Tubes | |
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Teaching Methodology:

Discussions and lecture Presentations, videos, animations. cases

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	40%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	10%	
Total	100%	

References:

1. **Cardiopulmonary Anatomy & Physiology: Essentials for Respiratory Care.** Terry Des Jardins. 6th Edition.2012. Delmar Cengage learning.

Respiratory care made incredibly easy. Rose Knapp. 2nd edition. 2018. Wolters Kluwer.

2. **Equipment for respiratory care.** Teresa, Volsko; Robert, Chatburn; Mohamad El-Khatib. 2016. Jones and Bartlett.
 3. **Clinical manifestations and assessment of respiratory disease,** Des Jardins, Terry & Burton, George, 7th edition, 2015. ELSEVIER
 4. **Injuries to the chest walls,** Mckee, Michael, Schemitsch, Emil. 2015. Springer
 5. **Physiotherapy in Respiratory Care: An Evidence-Based Approach to Respiratory and Cardiac Management.** 3rd edition. Alexandra Hough (2001). Nelson Thornes
- Related articles form Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817124
Course Title	Respiratory management1/ clinical
Credit Hours	(2)
Theoretical Hours	(0)
Practical Hours	(6)



Course description:

This course is the clinical component of Respiratory Management (1) course. It allows the respiratory therapist student to utilize the knowledge, skills and critical thinking to provide bronchial hygiene, establish and maintain airway management, care of chest tubes, apply and manage O2 therapy, and perform chest physiotherapy as needed.

Course objectives :**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

1. Assess the patients' needs in order to provide quick and efficient care.
2. Apply procedures related to respiratory therapy domain.
3. Support, teach, and prepare the patient and family for the different respiratory procedures.
4. Evaluate results of each intervention.
5. Assess patients on oxygen therapy.
6. Manage the chest tube drainage systems.
7. Apply the interventions necessary to prevent complications in a patient with a chest tube drainage system.
8. Apply strategies to maximize oxygen delivery with the goal of achieving a nontoxic FIO₂.
9. Apply adverse effects of positive endexpiratory pressure, how they are identified, and the appropriate treatment for each
10. Follow the client with respiratory problem.
11. Develop an individualized teaching plan to the client and family.



Course outline:

Unit #	Unit Name	Unit content	Time
1	Bronchial Hygiene	<ul style="list-style-type: none"> ● Coughing and deep breathing ● Chest physiotherapy <ul style="list-style-type: none"> ▪ Postural Drainage ▪ Chest Percussion and Vibration ● Contraindications and adaptations 	
2	Oxygen Therapy	<ul style="list-style-type: none"> ● Patient Assessment ● Oxygen Delivery Systems 	
3	Respiratory Airways Assessment and Management	<ul style="list-style-type: none"> ● Suctioning ● Oro/nasopharyngeal Airways ● Endotracheal Tubes ● Tracheostomy care ● Psychological care ● Comfort/Pain Control ● Skin Integrity 	
4	Chest Tubes	<ul style="list-style-type: none"> ● Equipment ● Chest Tube Placement ● Drainage system <ul style="list-style-type: none"> ● Drainage monitoring ● Water seal monitoring ● positioning ● Assessment and Management ● Transporting Patient with Chest Tube 	

Teaching Methodology:

Discussions and lecture Presentations, videos, animations. cases

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	٣٠%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	٢٠%	
Total	100%	



References:

1. **Equipment for respiratory care.** Teresa, Volsko; Robert, Chatburn; Mohamad El-Khatib. 2016. Jones and Bartlett.

Respiratory care made incredibly easy. Rose Knapp. 2nd edition. 2018. Wolters Kluwer.

2. **Clinical manifestations and assessment of respiratory disease,** Des Jardins, Terry & Burton, George, 7th edition, 2015. ELSEVIER
3. **Injuries to the chest walls,** Mckee, Michael, Schemitsch, Emil. 2015. Springer
4. **Physiotherapy in Respiratory Care: An Evidence-Based Approach to Respiratory and Cardiac Management.** 3rd edition. Alexandra Hough (2001). Nelson Thornes

- Related articles form Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817221
Course Title	Respiratory Management (2)
Credit Hours	(2)
Theoretical Hours	(2)
Practical Hours	(0)



Course description:

This course is designed to assist respiratory therapist student to acquire the knowledge and skills needed for maintaining acid-base balance, identifying disorders of hydrogen ion concentration, sampling and interpreting arterial blood gases, preparing and evaluating pulmonary function test, monitoring IPPB treatment , and identifying patients at risk for sleep apnea syndrome and its management.

Course objectives :**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

1. Acquire the knowledge of Acid-Base Balance.
2. Recognize the disorders of Hydrogen Ion that interrupt homeostasis .
3. Identify the Arterial Blood Gases test components and their normal ranges.
4. Know the diffraction between the normal and abnormal results for Arterial Blood Gases, venous and mixed samples
5. Prepare and evaluate for pulmonary function test (PFT)
6. Know the patients need assessment for IPPB treatment
7. Identify patients at risk for Sleep apnea syndrome and its management

B. Intellectual skills

1. Discuss the Arterial Blood Gases test and apply its knowledge in the interpretation of the results.
2. Discuss the clinical indications and other related respiratory therapy implications for procedures.

C. Subject specific skills

1. Know how to sample and interpret ABG's.
2. Evaluate a PFT
3. Manage a patient with IPPB treatment.
4. manage a patient with CPAP



Course outline;

Unit #	Unit Name	Unit content	Time
1	Arterial Blood Gases	<ul style="list-style-type: none"> ● Arterial Blood Gases : <ul style="list-style-type: none"> ▪ Introduction ▪ Normal values of ABG's ▪ Abnormal values of ABG's ● Sampling for ABG's Analysis <ul style="list-style-type: none"> ● Description ● Setting ● Indications ● Contraindications ● Complications ● Limitations ● Validation of results ● Assessment of need ● Assessment of test quality ● Resources ● Monitoring ● Frequency ● Infection control ● What to think about ● Interpretation of Acid Base disturbances in Blood Gas results ● Cases studies 	
2	Pulmonary Function Test(PFT)	<ul style="list-style-type: none"> ● Evaluating lung size (routinely). ● Lung volumes or flows. <ul style="list-style-type: none"> ● Measurement of lung volumes ● Preparation ● Spirometry ● Risk of PFT ● Maximum voluntary ventilation(MVV) 	
3	Intermittent positive pressure breathing IPPB Treatment	<ul style="list-style-type: none"> ● Description/Definition ● Indications ● Limitations of Procedure or Device ● Assessment of Need ● Resources ● Monitoring ● Frequency ● complications ● Infection Control 	

4	Sleep apnea management	<ul style="list-style-type: none"> • Types • Risk factors • Signs and symptoms • Nasal Continuous positive airway pressure CPAP 	
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Teaching Methodology:

Discussions and lecture Presentations, videos, animations. cases

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	40%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	10%	
Total	100%	

References:

1. **Clinical manifestations and assessment of respiratory disease**, Des Jardins, Terry & Burton, George. 7th edition, 2015. Elsevier

Respiratory care made incredibly easy. Rose Knapp. 2nd edition. 2018. Wolters Kluwer.

2. **Arterial blood gases made easy.** Hennessey, Lain; Japp, Alan. 2015. Elsevier

3. **Sleep apnea: pathogenesis, diagnosis and treatment.** Pack, Allan. 2nd edition. 2016. CRC Press.

4. **Interpretation of Pulmonary Function Tests: A Practical Guide.** Robert E. Hyatt, Paul D. Scanlon, Masao Nakamura. 4th edition. 2014. Lippincott Williams & Wilkins

5. **Core concepts in the disorders of fluid, electrolytes and acid-base balance**, Sands, Jeff; Mount, David; Sayegh, Mohamed; Singh, Ajay. 2013. Springer.

- Related articles form Nursing and Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817222
Course Title	Respiratory Management (2) / clinical
Credit Hours	(2)
Theoretical Hours	(0)
Practical Hours	(6)



Course description:

This course is the clinical component of Respiratory Management (2) course. It allows the respiratory therapist student to utilize the knowledge, skills and critical thinking to maintain acid-base balance, manage disorders of hydrogen ion concentration, interpret arterial blood gases, prepare for and evaluate pulmonary function test, apply incentive spirometer, monitor IPPB treatment, and manage sleep apnea syndrome.

Course objectives :**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

1. Demonstrate the ABG's test and apply the knowledge in the interpretation of the results.
2. Follow the client with blood gases abnormalities.
3. Apply the pulmonary function test (PFT)
4. Assess and follow the patients need for IPPB treatment and incentive spirometer
5. Assess and follow the patients need for CPAP treatment
6. Evaluate the patient with Sleep apnea syndrome



Course outline

Unit #	Unit Name	Unit content	Time
1	Acid Base Balance	<ul style="list-style-type: none"> ● Sampling for ABG Analysis ● Interpretation of Acid Base Disturbances in Blood Gas Results 	
2	Pulmonary function test	<ul style="list-style-type: none"> ● Measurement of lung volumes ● Preparation ● Spirometry ● Prevent risk of PFT 	
3	IPPB Treatment	<ul style="list-style-type: none"> ● Procedure of Device ● Preparation 	
4	Incentive spirometer	<ul style="list-style-type: none"> ● Procedure of Device 	
5	Sleep apnea syndrome	<ul style="list-style-type: none"> ● Nasal CPAP 	

Teaching Methodology:

Discussions and lecture Presentations, videos, animations. cases

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	٣٠%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	٢٠%	
Total	100%	

References:

1. **Clinical manifestations and assessment of respiratory disease**, Des Jardins, Terry & Burton, George. 7th edition, 2015. Elsevier
- Respiratory care made incredibly easy. Rose Knapp. 2nd edition. 2018.** Wolters Kluwer.
2. **Arterial blood gases made easy.** Hennessey, Lain; Japp, Alan. 2015. Elsevier
3. **Sleep apnea: pathogenesis, diagnosis and treatment.** Pack, Allan. 2nd edition. 2016. CRC Press.
4. **Interpretation of Pulmonary Function Tests: A Practical Guide.** Robert E. Hyatt, Paul D. Scanlon, Masao Nakamura. 4th edition. 2014. Lippincott Williams & Wilkins
5. **Core concepts in the disorders of fluid, electrolytes and acid-base balance**, Sands, Jeff; Mount, David; Sayegh, Mohamed; Singh, Ajay. 2013. Springer.

- Related articles form Nursing and Respiratory therapy journals.

Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817231
Course Title	Mechanical ventilation
Credit Hours	(2)
Theoretical Hours	(2)
Practical Hours	(0)



Course description:

This course is designed to assist the respiratory therapist student to acquire understanding of the therapeutic application of mechanical ventilation. It discusses the common indications of mechanical ventilation and its complication, ventilator modes, weaning from mechanical ventilation and the use of alternative modes of mechanical ventilation.

Course objectives:**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

1. Compare and contrast intermittent mandatory, assist-control, pressure-support, and pressurecontrolled ventilation
2. List the indication for and complications of mechanical ventilation.
3. List parameters that should be monitored during mechanical ventilation.

B. Intellectual skills

1. Discuss issues related to ventilator-associated lung injury.
2. Discuss issues related to selection of the initial ventilator settings.
4. Discuss the clinical indications and other related administration of mechanical ventilation
5. Discuss issues related to weaning from mechanical ventilation

C. Subject specific skills

1. Follow the patient with mechanical ventilation
2. Wean the patient from mechanical ventilation as per criteria
3. Develop an individualized teaching plan to the client and family.



Course outline

Unit #	Unit Name	Unit content	Time
1	Introduction	<ul style="list-style-type: none"> ● Background of Mechanical Ventilation ● Basic terms and concepts of mechanical ventilation ● How Ventilators Work 	
2	Indications for Mechanical Ventilation	<ul style="list-style-type: none"> ● Establish the Need for Mechanical Ventilation ● Criteria for Mechanical Ventilation ● Common indications of mechanical ventilation <ul style="list-style-type: none"> ● Apnea with respiratory arrest ● Tachypnea or bradypnea ● Acute lung injury ● Respiratory rate ● Vital capacity ● Minute ventilation ● Arterial partial pressure of oxygen ● Alveolar-arterial difference in oxygen tension <ul style="list-style-type: none"> ● COPD ● Clinical deterioration ● Respiratory muscle fatigue ● Hypotension ● Blood gases showing persistent hypoxemia ● Acute partial pressure of CO₂ ● Neuromuscular disease <ul style="list-style-type: none"> ● Inspiratory pressure ● Vital capacity 	
3	Classification of positive- pressure Ventilators	<ul style="list-style-type: none"> ▪ Mechanical Ventilators – Negative-Pressure Ventilators – Positive-Pressure Ventilators 	
4	Initial Ventilator setting	Ventilator Modes <ul style="list-style-type: none"> ● Volume Modes <ul style="list-style-type: none"> ▪ Assist-Control Mode ▪ Synchronized Intermittent 	

		<ul style="list-style-type: none"> ▪ Mandatory Ventilation Mode ● Pressure Modes <ul style="list-style-type: none"> ▪ Pressure-Support ▪ Pressure-Controlled ▪ Volume-Guaranteed Pressure ● Options Mode ● Continuous Positive Airway ● Noninvasive Bilateral Positive Airway Pressure ● Sighs ● Initial FIO₂ <ul style="list-style-type: none"> ● Positive end expiratory pressure ● Summary of initial ventilator setup ● Responding to alarms ● Ensuring humidification and thermoregulation 	
5	Weaning From Mechanical Ventilation	<ul style="list-style-type: none"> ● Guidelines for Weaning From Short-Term Ventilation ● Guidelines for Weaning From Long-Term Ventilation ● Methods for Ventilation Weaning ● Extubating criteria ● Adjuncts to weaning 	
6	Complications of Mechanical Ventilation	<ul style="list-style-type: none"> ● Aspiration ● Complications of intubation ● Oxygen toxicity ● Intrinsic PEEP, or auto-PEEP ● Hemodynamic effects of mechanical ventilation ● Ventilator – associated pneumonia ● Ventilator-induced lung injury (barotrauma, volutrauma) ● Water imbalance ● Complications associated with immobility 	
7	Alternative modes of Mechanical Ventilation	<ul style="list-style-type: none"> ● Dual-control, breath-to-breath, pressure-limited, time-cycled ventilation ● Dual-control breath-to-breath, pressure-limited, flow-cycled ventilation ● Automode and variable support or variable-pressure control ● Dual control within a breath 	

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|--|---|--|
| | <ul style="list-style-type: none"> • Automatic tube compensation • Proportional assist ventilation • High-frequency ventilation • Airway pressure–release ventilation | |
|--|---|--|

Teaching Methodology:

Discussions and lecture Presentations, videos, animations. cases

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	40%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	10%	
Total	100%	

References:

- 1- **Basics of mechanical ventilation**, Poor, Hooman. 2018. Springer
 - 2- **PILBEAM'S Mechanical Ventilation Physiological and Clinical Applications**. J.M. Cairo. 6th edition. 2015. Elsevier.
 - 3- **Noninvasive mechanical ventilation and difficult weaning in critical care** Esquinas, Antonio, 2016. Springer.
 - 4- **Essentials of mechanical ventilation**, Dean Hess; Robert Kacmark, 2014. McGraw Hill
 - 5- **Clinical application of mechanical ventilation**, David Chang. 2013. Cengage learning
 - 6- **Principles and practice of mechanical ventilation**. Martin J. Tobin. 2012. McGraw Hill.
- Related articles form Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817232
Course Title	Mechanical ventilation/clinical
Credit Hours	(2)
Theoretical Hours	(0)
Practical Hours	(6)



Course description:

This course is the clinical component of Mechanical ventilation course. It enables the student to use the technical knowledge and the practical skills to effectively manage mechanical ventilation at various states of respiratory compromise and disability, change the ventilator modes, and carry on with the process of weaning.

Course objectives :

Intended Learning Outcomes

Upon the completion of this course the student will be able to:

- 1- Select initial ventilator settings.
- 2- Monitor patient during mechanical ventilation and change the settings depending on the respiratory monitoring.
- 3- Follow the client with mechanical ventilation and evaluate the ventilator performance.
- 4- Manage Endotracheal and Tracheostomy tube cuffs.
- 5- Prevent ventilator-associated lung injury.
- 6- Wean the patient from mechanical ventilation.
- 7- Develop an individualized teaching plan to the client and family.



Course outline

Unit #	Unit Name	Unit content	Time
1	Management of mechanical ventilation	<ul style="list-style-type: none"> ● Setting Minute Ventilation ● Setting baseline pressure ● Assessing patient on mechanical ventilation ● Management of Endotracheal and Tracheostomy Tube Cuffs ● Responding to alarms ● Ensuring humidification and thermoregulation ● Evaluation of Ventilator Performance 	
2	Weaning From Mechanical Ventilation	<ul style="list-style-type: none"> ● Evaluation of Clinical Criteria for Weaning ● Assessment of Readiness for Weaning Using Evaluation Criteria ● Assessment During a Spontaneous Breathing Trial ● Removal of the Artificial Airway ● Weaning criteria ● Extubation 	

Teaching Methodology:

Discussions and lecture Presentations, videos, animations. cases

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	٣٠%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	٢٠%	
Total	100%	



References:

- 1- **Basics of mechanical ventilation**, Poor, Hooman. 2018. Springer
 - 2- **PILBEAM'S Mechanical Ventilation Physiological and Clinical Applications**. J.M. Cairo. 6th edition. 2015. Elsevier.
 - 3- **Noninvasive mechanical ventilation and difficult weaning in critical care** Esquinas, Antonio, 2016. Springer.
 - 4- **Essentials of mechanical ventilation**, Dean Hess; Robert Kacmark, 2014. McGraw Hill
 - 5- **Clinical application of mechanical ventilation**, David Chang. 2013. Cengage learning
 - 6- **Principles and practice of mechanical ventilation**. Martin J. Tobin. 2012. McGraw Hill.
- Related articles form Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817112
Course Title	Adult diseases (1)
Credit Hours	(3)
Theoretical Hours	(1)
Practical Hours	(6)



Course description:

The course is designed to provide the respiratory therapist student with thorough knowledge regarding the common medical and surgical disorders, their etiology, clinical manifestations, diagnostic procedures, and management. During this course, the student will examine the impacts of having such disorders on the respiratory care provided. This information helps the student to plan appropriate care and teaching materials.

Course objectives :

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

1. Identify the techniques of assessing body systems.
2. Recognize health alterations and principal manifestations of common health disorders in the adult and the elderly client.
3. Understand factors related to the disease processes, diagnostic evaluation, and interventions of common health disorders.
4. Participate in implementation a care plan of the patient with alteration of ventilation and gas exchange

B. Intellectual skills

1. Followup the client with acute and chronic health disorders.
2. Discuss the clinical indications, client preparation and other related implications for common tests and procedures.

C. Subject specific skills

1. Develop an individualized teaching plan to the client and family.
2. utilize the knowledge in measuring the impact of each disorder on the respiratory care.



Course outline:

Unit #	Unit Name	Unit content	Time
1	Assessment and care of client with cardiovascular alterations	<ul style="list-style-type: none"> • Assessment of cardiac function. • Etiology, • Clinical manifestations, • Diagnostic procedures, • Management • Impact on respiratory care 	
2	Assessment and care of client with alteration of renal alterations	<ul style="list-style-type: none"> • Assessment. • Etiology, • Clinical manifestations, • Diagnostic procedures, • Management • Impact on respiratory care 	
3	Assessment and care of client with neural alterations	<ul style="list-style-type: none"> • Assessment. • Etiology, • Clinical manifestations, • Diagnostic procedures, • Management • Impact on respiratory care 	

Teaching Methodology:

Discussions and lecture Presentations, videos, animations. cases

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	٥٠%	--/--/----
Final Exam	50%	--/--/----
Total	100%	



References:

1. **Respiratory Care: Principles and Practice**, 3rd Edition. Dean R. Hess, Neil R. MacIntyre, William F. Galvin, Shelley C. Mishoe. 2016. Jones and Bartlett.
 2. **Clinical manifestations and assessment of respiratory disease**, Des Jardins, Terry & Burton, George, 7th edition, 2015. ELSEVIER
 3. **Respiratory disease:A Case Study Approach to Patient Care**. Wilkins, Dextar, Gold . 2006. F.A.Davis.
 4. **Medical-Surgical Nursing: Assessment and Care of Clinical Problems**. 10th Ed. Lewis, S.; Bucher, L.;Heitkemper, M.; Harding, M.; Kwong, J. 2017. Elsevier
- Related articles form Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817213
Course Title	Critical care / clinical
Credit Hours	(2)
Theoretical Hours	(0)
Practical Hours	(6)



Course description:

This course is the clinical component of the critical care course. It enables the respiratory therapist student to integrate theory and practice to develop clinical decision making skills, in order to manage the critically ill patient either in the critical care area or the emergency department. It also focuses on managing infection control, patient's isolation, hand hygiene, sterilization, waste disposal and needles stick.

Course objectives :

Upon the completion of this course the student will be able to:

1. Assess many varying emergency situations to determine what kind of patient care is needed and to provide the necessary care.
2. Apply knowledge to deliver respiratory care interventions that will enhance treatment outcomes and patient care quality.
3. Intervene with critically ill patient according to evidence, critical thinking, problem solving, and priority setting in clinical situation.
4. Utilize advanced communication and team skills to interact with the patient, family and other health care provider.
5. Demonstrate practice in diverse setting.
6. Deal with common airway obstruction.
7. Deal with medical emergency care for suffocation, respiratory arrest, cardiac arrest and Stroke.
8. Apply the principles of Basic Life Support
9. DO Cardio Pulmonary Resuscitation CPR for adult, pediatric, infant.
10. Participate in managing and caring of a patient with infectious disease.
11. Apply strategies to control the spread of infection in the hospital.
12. Develop an individualized teaching plan to the client and family



Course outline:

Unit #	Unit Name	Unit Content	Time
1.	Critical care	<ul style="list-style-type: none"> ● Critical care unit ● Responsibilities of RT in critical care settings ● Skills required ● Critical thinking skills ● Communication skills ● Detail oriented ● Emotional stability 	
2.	CPR	<ul style="list-style-type: none"> ● Emergency unit ● Definition ● Purpose ● Description ● Performing adult, pediatric, infant CPR ● Preparation 	
3.	Infection prevention and control in respiratory and critical settings	<ul style="list-style-type: none"> ● Safe patient handling and movement ● Adherence to the steps of hand washing. ● The safe handling and disposal of sharps ● The prevention and management of hospital and community-acquired pneumonia ● Sterilization and disinfection procedures in respiratory unit/ critical care unit. ● External cleansing of the machine and other surfaces in the unit. ● Classify the wastes according to infection control policies. 	

Teaching Methodology:

Discussions and lecture Presentations, videos, animations. Cases, CPR workshop

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	٣٠%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	٢٠%	
Total	100%	



References:

1. **Harrisons Pulmonary and Critical Care Medicine.** Joseph Loscalzo. 3rd edition. 2016. McGraw-Hill
2. **Respiratory Care: Principles and Practice,** 3rd Edition. Dean R. Hess, Neil R. MacIntyre, William F. Galvin, Shelley C. Mishoe. 2016. Jones and Bartlett.
3. **Integrated Palliative Care of Respiratory Disease.** Stephen J. Bourke, E. Timothy Peel (auth.), Stephen J. Bourke, Edwin Timothy Peel (eds.). 2013. Springer.
4. **Advanced Paediatric Life Support, Australia and New Zealand: A Practical Approach to Emergencies.** Advanced Life Support Group.6th Edition. 2017. Wiley
5. **Practical Resuscitation for Healthcare Professionals.** Edited by Pam Moule and John Albarran. 2nd edition. 2009. Wiley
6. **Fundamentals of Infection Prevention and Control. Theory and Practice.** Debbie Weston. 2nd edition. 2013. Wiley.
7. **The illustrated guide to infection control.** Motacki, Kathleen; O'mara, Neeta B.; Kopian, Toros. 2011. Springer.
 - **Infection control manual procedures and policies** (Royal Medical Services).
 - Related articles form Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817212
Course Title	Critical care
Credit Hours	(2)
Theoretical Hours	(2)
Practical Hours	(0)



Course description:

This course is designed to introduce the respiratory therapist student to the critical areas and environments. It helps develop the student's theoretical and practical knowledge of life threatening critical illnesses / injuries management, that require advanced technology and monitoring. It also covers topics like Cardio Pulmonary Resuscitation (CPR), and palliative care. It also aims to equip the student on infection control principles, patient's isolation, hand hygiene, sterilization, waste disposal and needles stick in respiratory/ critical care settings.

Course objectives :**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

1. Understand the patients' health and intervention that will enhance treatment outcomes.
2. Identify strategies to deal with common airway obstruction.
3. Identify strategies to deal with medical emergency care for Suffocation, Respiratory arrest, cardiac arrest and Stroke.
4. Assess many varying emergency situations to determine what kind of patient care is needed and to provide the necessary care.
5. Identify the principles of Basic Life Support
6. Recognize the general rules, ethics, basis, and steps of Cardio Pulmonary Resuscitation CPR for adult, pediatric, infant .
7. Define health care associated infections and state how often they occur.
8. Discuss risk factors, clinical manifestations, medical management, and methods to prevent or reduce the transmission of Multi-Drug Resistant Organisms.

B. Intellectual skills

1. Follow-up the clients with critical disorders
2. Demonstrate practice in diverse setting.
3. Discuss the clinical indications, client preparation and other related implications for common tests and procedures.
4. Describe the importance of infection prevention in respiratory/ critical care.

C. Subject specific skills

1. Examine and assess the causality safely and effectively.
2. Show evidence of critical thinking, problem solving, and priority setting to intervene in clinical situation with critically ill patient.



3. Utilize advanced communication and team skills to interact with the patient, family and other health care provider
4. Develop an individualized teaching plan to the client and family.
5. Participate in managing and caring of a patient with infectious disease.

Course outline:

Unit #	Unit Name	Unit content	Time
1.	Introduction	<ul style="list-style-type: none"> ● Description of the critical care unit. ● Critical care environment. ● Medical, legal and ethical issues ● Withholding and withdrawing treatments 	
2.	Approach to common critical illnesses and situations	<ul style="list-style-type: none"> ● Shock ● Sepsis and septic shock ● ARDS ● Cardiogenic shock ● Respiratory arrest ● Cardiac arrest ● Stroke ● Suffocation ● Head injury ● Coma ● Sudden death 	
3.	The critical ill older patient	<ul style="list-style-type: none"> ● Normal characteristic of aging ● Physical challenges ● Psychological challenges 	
4.	The critical ill pediatric patient	<ul style="list-style-type: none"> ● Anatomical and physical differences ● Physical challenges 	
5.	End-of-life care in relation to respiratory conditions	<ul style="list-style-type: none"> ● Grief and loss ● Communicating sensitively and supporting the patients and their family ● Managing symptoms related (breathlessness, death rattle) ● Integrating Palliative care 	
6.	CPR	<ul style="list-style-type: none"> ● Definition ● Purpose ● Description ● Preparation ● Performing adult, pediatric, infant CPR ● Basic life support 	

7.	Infection control in respiratory and critical care settings	<ul style="list-style-type: none"> ● Importance of infection control. ● The burden of healthcare-associated infections. ● Isolation and standard precautions ● Personal protective equipment ● Prevent accidental exposure to blood-borne diseases. 	
		<ul style="list-style-type: none"> ● The way of Specific organismstransmission, serology screening, and vaccination. ● Multi-Drug Resistant Organisms: <ul style="list-style-type: none"> ● Way of transmission ● Medical managements and care. ● Classificationof waste disposal 	

Teaching Methodology:

Discussions and lecture Presentations, videos, animations. Cases, CPR workshop

Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	40%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	10%	
Total	100%	



References:

1. **Harrisons Pulmonary and Critical Care Medicine.** Joseph Loscalzo. 3rd edition. 2016. McGraw-Hill
2. **Respiratory Care: Principles and Practice,** 3rd Edition. Dean R. Hess, Neil R. MacIntyre, William F. Galvin, Shelley C. Mishoe. 2016. Jones and Bartlett.
3. **Integrated Palliative Care of Respiratory Disease.** Stephen J. Bourke, E. Timothy Peel (auth.), Stephen J. Bourke, Edwin Timothy Peel (eds.). 2013. Springer.
4. **Advanced Paediatric Life Support, Australia and New Zealand: A Practical Approach to Emergencies.** Advanced Life Support Group.6th Edition. 2017. Wiley
5. **Practical Resuscitation for Healthcare Professionals.** Edited by Pam Moule and John Albarran. 2nd edition. 2009. Wiley
6. **Fundamentals of Infection Prevention and Control. Theory and Practice.** Debbie Weston. 2nd edition. 2013. Wiley.
7. **The illustrated guide to infection control.** Motacki, Kathleen; O'mara, Neeta B.; Kopian, Toros. 2011. Springer.
 - **Infection control manual procedures and policies** (Royal Medical Services).
 - Related articles form Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817233
Course Title	Respiratory management for Neonates and infants
Credit Hours	(3)
Theoretical Hours	(1)
Practical Hours	(6)



Course description:

This course is designed to introduce the respiratory therapist student to the fetal and neonatal development, respiratory disorders commonly seen in the neonatal and pediatric population, and the common diagnostic tests and procedures. It also assists the student to acquire understanding of the introduction of mechanical ventilation as a major new intervention which provides lifesaving support for infants with respiratory failure. It addresses the indications and contraindications for mechanical ventilation.

Course objectives :**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

1. Describe the normal/ abnormal lung development in neonates
2. Discuss the pathophysiology, etiology, and clinical management of selected respiratory disorders
3. Understand and list the complications associated with mechanical ventilation
4. Understand the indication of mechanical ventilation in pediatric and infant
5. Identify the indication high frequency ventilator.

B. Intellectual skills

1. follow the neonate with mechanical ventilation
2. discuss the clinical indications of mechanical ventilation

C. Subject specific skills

1. Practice procedures and techniques associated with neonatal transfer, scoring system, and resuscitation
2. Develop an individualized teaching plan to the client and family.



Course outline:

Unit #	Unit Name	Unit content	Time
1	Neonatal development and maldevelopment	<ul style="list-style-type: none"> ● Development of respiratory system ● Developmental lung anomalies ● Cardiac anomalies (ASD, VSD, PDA, Overriding aorta)	
2	Procedures and techniques	<ul style="list-style-type: none"> ● Clinical examination ● Infant scoring system ● Surfactant replacement therapy 	
3	Assessment and management of Neonatal respiratory disorders	<ul style="list-style-type: none"> ● Respiratory failure ● Tissue hypoxia ● RDS ● Meconium aspiration syndrome ● Pneumonia ● Pneumothorax ● Persistent Pulmonary hypertension ● Apnea syndromes ● Congenital Diaphragmatic hernia ● Tracheoesophageal fistula ● Pulmonary hyperplasia 	
4	Chronic lung disease	<ul style="list-style-type: none"> ● Etiology and pathophysiology ● Clinical management 	
5	Neonatal and Pediatric Mechanical Ventilation	<ul style="list-style-type: none"> ● Goals of Newborn and Pediatric Ventilatory Support ● Care of ventilated infant ● Transporting ventilated infants ● Complications associated with mechanical ventilation <ul style="list-style-type: none"> ● Thoracic air leaks ● Patent ductus arteriosus ● Neonatal pulmonary hemorrhage ● Retinopathy of prematurity ● Neurologic complications 	

Teaching Methodology:

Discussions and lecture Presentations, videos, animations. cases



Exams and method of evaluation:

Exams	Percentage	Date
Midterm Exam	٥٠%	--/--/----
Final Exam	50%	--/--/----
Total	100%	

References:

1. **Foundations in neonatal and pediatric respiratory care.** Terry Volsko; Sherry Barnhart. 2020. Jones and Bartlett.
 2. **Manual of neonatal respiratory care.** Steven M. Donn MD, Sunil K. Sinha (editors). 4th edition. 2017. Springer.
 3. **Pediatric and neonatal mechanical ventilation : from basics to clinical practice.** Rimensburger, peter. 2015. Springer.
 4. **PILBEAM'S Mechanical Ventilation Physiological and Clinical Applications.** J.M. Cairo. 6th edition. 2015. Elsevier.
 5. **Clinical manifestations and assessment of respiratory disease,** Des Jardins, Terry & Burton, George, 7th edition, 2015. Elsevier
 6. **Principles and practice of mechanical ventilation.** Martin J. Tobin. 2012. McGraw Hill
- Related articles form Respiratory therapy journals.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817291
Course Title	Field Training
Credit Hours	(3)
Theoretical Hours	(0)
Practical Hours	



Course Description:

This course enables the respiratory therapist student to apply the sum of the theoretical and technical knowledge related to respiratory care in the various clinical settings. The student will take full responsibility under the supervision of clinical instructors and staff in charge (who act as preceptors). This training offers the student the opportunity to provide and manage respiratory care for patients in the adult intensive care unit, the operating room, the wards and emergency department, the rehabilitation/long-term care unit, as well as the pulmonary function and sleep laboratories. Evaluation emphasis will be placed on safety, professionalism, performance of clinical competencies, using various performance assessment tasks.

Course objectives :**Intended Learning Outcomes**

Upon the completion of this course the student will be able to:

1. **knowledge:** to have acquired the knowledge necessary for the safe practice of respiratory care. The student will obtain this knowledge during clinical placements, structured educational activities and independent learning.
2. **Skills** - demonstrate ability and training in the following areas:
 - a) Advanced life support.
 - b) Respiratory function testing. The student should know how to perform routine lung function tests, assessment of airways hyper-responsiveness, hypoxic challenge and exercise testing. The student should also be competent in reporting the results.
 - c) Sleep studies. Trainees should have experience in screening studies, and initiation of CPAP.
 - d) Non-invasive ventilation. Students should have experience in selecting patients who will benefit from this treatment in the acute and chronic situation and have experience of setting up the machinery.
 - e) Mechanical ventilation.

The trainee will obtain these skills during clinical placements, structured educational activities and practice under supervision.

3. **Attitude** - the trainee will demonstrate a high standard of ethical and professional behavior in his work. He will have the ability to work as part of a multidisciplinary team and to show the appropriate tact, empathy and communication skills in dealing with patients, colleagues, and other health care professionals.



The following behavior characteristics will be demonstrated:

- Interpersonal skills
- Self-confidence together with recognition of own limitations
- Flexibility
- Resilience
- Decisiveness
- Accountability
- Non-judgmental approach
- Thoroughness
- Enthusiasm and drive
- Integrity

These attitudes will be developed during clinical placements and by the formal training program.

- ❖ The student will be required to demonstrate appropriate management and negotiating skills, participating in multidisciplinary staff organization.
- ❖ Recognition of the importance of life-long learning

Content:

In-Patient training and experience

This is best obtained in a unit dealing with the full range of the commoner acute and chronic respiratory conditions. If training takes place in more specialized units appropriate attachments either to other specialized units or to a more general unit will be required to provide a sufficient and balanced range of training and experience.

Respiratory anatomy, pathophysiology

Students should have a sound understanding of respiratory anatomy and gain experience in pathophysiology as related to respiratory care during the training period.

Intensive care

Practical training and experience in intensive care are essential for training in respiratory care.

Palliative medicine

Trainees should gain experience in palliative care particularly in relation to patients with carcinoma of the bronchus. The trainees should have knowledge of palliative care services and understand the role of the RT.



Pulmonary rehabilitation

Trainees should understand the importance of pulmonary rehabilitation and seek opportunities to gain first-hand experience in this area. A knowledge of methods of administration of supplemental oxygen and the appropriate selection of patients is essential.

Respiratory physiology

Dedicated time within the training program should be allocated for practical training and laboratory experience in measurement and interpretation of lung function tests. Students should be involved, with appropriate supervision, in issuing reports on physiological investigations. A period of attachment to a unit regularly performing more detailed assessments of pulmonary physiology is highly desirable.

Teaching and learning methods

1. An appropriate structured training program covering the syllabus training program in respiratory medicine.
2. Appropriate clinical placements to enable the student to fulfill the requirements of the course. It is emphasized however that it is the responsibility of the student at all times to assume appropriate responsibility for self-assessment, continuing self-directed learning and the maintenance of competence.

The clinical placements will include:

- Ward-rounds
- Clinics
- Intensive care unit.
- The operating room.
- Emergency department,
- Rehabilitation/long-term care unit,
- Pulmonary function
- Sleep laboratories.

Learning methods

- Ward-rounds
- Lectures
- Multi-disciplinary groups
- Discussion groups
- Research
- Use of the web for clinical information
- Daily Assessment



Assessment methods

Evaluation emphasis will be placed on safety, professionalism, performance of clinical competencies, using various performance assessment tasks.

- Observation by educational supervisor
- Record of achievements
- Multiple choice and problem solving tests
- Ward round, bronchoscopy assessment , outpatient letters
- Discharge summary review
- Views of colleagues and patients



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817113
Course Title	Pharmacology for respiratory therapy
Credit Hours	(2)
Theoretical Hours	(2)
Practical Hours	(0)



Course description:

This course is designed to provide students with general information and description of the important drugs and Pharmacokinetics of different classes of drugs, legal responsibilities, and safe drug administration and Respiratory Pharmacology and Pharmacology of the central and autonomic nervous systems and Pharmacology of the cardiovascular and renal systems.

Course objectives :

Intended Learning Outcomes

Upon the completion of this course the student will be able to:

A. Knowledge & Understanding

1. Acquire the knowledge of the general principles of pharmacology that will enable the student to use drugs properly and safely in practice.
2. Identify the therapeutic indications, and contraindications of drugs commonly used in clinical practice.
3. Identify the most common examples of the most widely used drugs.

B. Intellectual skills

1. Describe and define the basic terms and concepts of pharmacology
2. Relate the type of the medication to the disorder being treated.

C. Subject specific skills

1. Identify the roles of the RT in relation to medication administration and education

D. Transferable skills

1. Being able to assess appropriate/inappropriate responses to therapy.



Course outline:

Unit #	Unit name	Unit Content	Time
	General principles of pharmacology	<ul style="list-style-type: none"> • Pharmacokinetics. • Drug formulations and calculating drug doses • Routes of drug administration • Pharmacodynamics • Medication errors • Classification of medications 	
	Respiratory Pharmacology	<ul style="list-style-type: none"> • Aerosolized Agents • Adrenergic bronchodilators • Anticholinergic bronchodilators • Using Mucoactive therapy • Clinical indications for surfactants • Corticosteroids in respiratory care • Variations for neonates and pediatrics 	
	Pharmacology of the central and autonomic nervous systems	<p style="text-align: center;">Effects of Drugs on the Central Nervous System</p> <p style="text-align: center;">Effects of Drugs on the Autonomic Nervous System</p> <ul style="list-style-type: none"> • Sedative – hypnotics 	
	Pharmacology of the cardiovascular and renal systems	<p style="text-align: center;">Antianginal Medications</p> <p style="text-align: center;">Antiarrhythmic Medications</p> <p style="text-align: center;">Antihypertensive Medications</p> <p style="text-align: center;">Heart Failure and Treatment</p> <p style="text-align: center;">Diuretics</p> <p style="text-align: center;">Medications for Coagulation Disorders</p>	

Method of teaching

Lectures , Discussion, Presentation. Videos, animations

Exams and method of evaluation

Exams	Percentage	Date
Midterm Exam	40%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	10%	
Total	100%	



References:

Rau's Respiratory Care Pharmacology. Douglas Gardenhire. 9th edition. 2015. Mosby

Workbook for Rau's Respiratory Care Pharmacology. Douglas Gardenhire and Sandra Hinski. 9th edition. 2015. Mosby

Frequently prescribed medications. Manceno, Gallagher, (2014). Jones & Bartlett

Cardiopulmonary Pharmacology for Respiratory Care. Moini, Jahangir. 2012. Jones and Bartlett.

Respiratory care made incredibly easy. Rose Knapp. 2nd edition. 2018. Wolters Kluwer.



Para-Medical Program	
Specialization	Respiratory Therapy
Course Number	020817125
Course Title	Basic physics for respiratory therapy
Credit Hours	(2)
Theoretical Hours	(2)
Practical Hours	(0)



Course description:

This course provides the students with basic knowledge regarding concepts in the physics and the applications of gas laws in respiratory therapy. It discusses the physical characteristics of medical gasses, their storage, distribution, and regulation, besides fluid mechanics. Laws and dynamics of fluids and Gas Exchange, Medical gases.

Course objectives :

Intended Learning Outcomes

At the end of this course the students should :

Knowledge and understanding:

1. Acquire the knowledge of the gas laws.
2. Acquire the knowledge of the Fluid mechanics.
3. Acquire the knowledge of the physical characteristics of medical gases.

Intellectual skills:

4. Describe and define the basic terms and concepts .
5. Understand the gas exchange process.

Transferable skills:

6. Apply the concepts to operation of respiratory therapy equipment.



Course outline:

Unit #	Unit name	Unit Content	Time
1	Basic physics for respiratory therapist	States of matter Change of state Laws of thermodynamics	
2	Laws and mechanics of Gases	Mechanics Laws Properties of gases at extreme temperature and pressure	
3	Laws and dynamics of fluids	Dynamics Laws	
4	Gas Exchange	Alveolo-capillary Exchange Solubility and Diffusion Partition Coefficient Humidity	
5	Medical gases	Characteristics of medical gases (Oxygen, Air, carbon dioxide, helium, nitric acid, nitrous oxide) Storage of Medical Gases Gas cylinders Bulk oxygen Distribution and regulation of medical gases Central piping systems Safety indexed connector Regulating gas pressure and flow	

Method of teaching

Lectures, group discussion, videos, live patterns & samples, practical applications, field visits(Industries)

Exams and method of evaluation

Exams	Percentage	Date
Midterm Exam	40%	--/--/----
Final Exam	50%	--/--/----
Homework and Projects	10%	
Total	100%	



References:

1. **Egan's fundamentals of respiratory care**, 11th edition. Kacmarek, R., Stoller, J., Heuer, A. (2017). Elsevier
2. **Physics, Pharmacology and Physiology for Anesthetists**, 2nd edition. Cross, M., and Plunkett, E. (2014). Cambridge University Press.
3. **Mosby's Respiratory Care Equipment, 10th Edition**. Cairo, J.M. (2018). Elsevier.
4. Chemistry and Physics for Nurse Anesthetist, A student centered approach. Shubert, D. and Leyba, J. (2009). Springer

