Republic of Yemen

Ministry of Higher Education & Scientific Research

21 September University of Medical & Applied Sciences (21 UMAS)
Vice- Rectorship of Graduate Studies & Scientific Research

CURRICULUM

MASTER OF SCIENCE IN RESPIRATORY CARE

(MsRC)

Academic Program

August 2021

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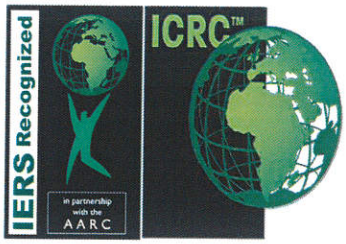
This program will be recognized by IERS-ICRC:



Contributors

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Abbreviations

ACLS Advanced Cardiac Life Support

ABG Arterial Blood Gas

AIDS Acquired Immunodeficiency Syndrome

CCU Cardiac care unit

BLS Basic Life upport

BSC Bachelor Science

CGPA Cumulative Grade Point Average

COC Certificate of Competence

CPR Cardio Pulmonary Resuscitation

CVS Cardio Vascular System

DOCS Direct Observation of Clinical Skills

ECCN Emergency &Critical Care Medicine

MOH Ministry of Health

HIS Health Information System

HMIS Health Management Information System

ICU Intensive Care Unit

OSCE Objective structured clinical examination

OR Operation rooms

OSPE Objective structured practical exam

PBL Problem-Based Learning

PFT Pulmonary function testing

RT Respiratory therapy / Respiratory therapist

RCS Respiratory Care Specialist

YMC Yemeni Medical Council

TMGH Thawra Modern General Hospital

RCSA Respiratory Care Services Administration

YMC Yemeni Medical Council

Preface

Health of the people is an index of the level of development of a country and achievement of optimum health is the desire of every individual. The success of a country in preventing disease and promoting health depends upon the contribution of all members of the health team. Being able to breath is one of the basic essentials of life and ***respiratory therapists*** are the monitors and guardians of a patient's ability to access this necessity.

21 September University of Medical & Applied Sciences (21 UMAS) was opened in 2016, with the intention to alleviate the severe shortage of medical doctors and allied medical professionals in the country. In line with various encouraging efforts performed by the Ministry of Public Health & Population in this regard, the 21 September University of Medical & Applied Sciences is providing much-needed medical professionals to the people of Yemen. The 21 UMAS will initiate Yemen's first integrated curriculum for its undergraduate medical education, and is currently expanding to postgraduate programs in the postgraduate college and diversifying its undergraduate program offerings.

Respiratory therapists are allied health professionals trained in the skillful use of advanced diagnostic tools to evaluate, diagnose, manage and administer respiratory treatment modalities for a wide variety of breathing disorders in neonatal, pediatric, adult, and geriatric patients. Respiratory therapists cooperate with doctors and nurses and they perform respiratory care modalities that include oxygen therapy, perform breathing techniques and maneuvers including incentive spirometry, humidity-aerosol therapy, pulmonary drainage procedures, Sputum and ABG sample collection procedures, thermal regulation procedures, mechanical ventilation, and cardiopulmonary resuscitation.

Respiratory care practitioners work in acute care hospitals with adults, premature infants and geriatric patients in surgical services, air and ground intra-facility transport, multi-disciplinary nutrition teams, emergency department, neonatal/pediatric intensive care, and medical, cardiac, and surgical intensive care. Practitioners are usually stationed in ICU and /or emergency departments of hospitals. They may also work in environments such as the diagnostic pulmonary laboratory, sleep lab centers, bronchoscopy laboratory, long-term acute care units, hyperbaric oxygen (HBO) units, or they may work as a traveling therapist, home respiratory therapist, or pharmaceutical sales representative. A master's level in

Respiratory Care, in addition to the above areas, will be able to work in management of respiratory and related units of hospitals, conduct research, and engage in teaching of respiratory and critical care students in higher academic institutions.

Rationale

Non-communicable diseases (NCDs) are the leading causes of death and disability globally, killing more than three in five people worldwide and responsible for nearly half of the global burden of disease (1). 80% of NCDs deaths occur in low- and middle-income countries.

According to the MoH and WHO recent reports, Yemen is witnessing an increase in NCD burden and injuries. Today, NCDs account for estimated 57% % of deaths in Yemen. By 2040, they are projected to account for almost 71% of the country's disease burden , up from 20% in 1990. The four main types of non-communicable diseases are cardiovascular diseases (like heart attacks and stroke), cancer, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes.

As a result, in addition to the health promotion and preventive activities, the government is highly committed than ever before to improve the quality of therapeutic services in hospitals. Settings for relatively complex surgical and /or invasive procedures which usually require advanced respiratory system support are coming in to operational in our country.

In the meantime, the epidemiologic shift is requiring more intensive care beds in hospitals and also is creating longer patient stays in critical care units. With the advancement of healthcare technology, application of advanced respiratory support medical devices to patients is becoming a standard which then increases the complexity of critical care service delivery. For example, practitioners in TMGH estimate close to half of patients admitted in hospital ICUs requires some type of breathing treatment and artificial breathing (mechanical ventilation) support.

The application of advanced level respiratory support devices requires a dedicated professional who is trained in depth to continuously and closely monitor, understand the patient's condition in response to these devices, process lab diagnostics such as ABG, adjust and manipulate the machines parameter in line with the very dynamic nature of the vital signs of the patients on these supportive devices.

When there is a need for advanced respiratory support for a patient in ICUs or Operation Theaters, there needs to be a dedicated professional (Respiratory Therapist) who can

closely monitor, analyze and do real-time adjustments on the relatively complex parameters of the devices. Preparing the specialized cadre of Respiratory therapists with advanced knowledge, skills and attitudes is highly important to improve hospitals critical care standards.

Not only in tertiary level health care institutions, Respiratory therapists are needed country wide in all regional hospitals, central hospitals running ICUs and specialty medical centers managing critical patients. The new standard for health institutions requires hospitals to run intensive care units. Hence, mechanical ventilators, pulmonary diagnostic machines, and breathing support machines become standard in hospitals in Yemen due to RCSA-MoH regulations . The government by MoH recently is working towards a well-equipped adult ICUs & NICUs. We also believe our country in few years will start to have long-term pulmonary rehab centers, institutionalized home care services, specialized sleep and many pulmonary clinics and so on. All the above trends will need to have a health professional in large number with a special training on respiratory care. It is also to be noted that RT is one of the matured professions in the developed nations like USA and Canada which started the profession some 6 decades ago.

In our context, health professionals working in critical care and emergency units (critical care nurses, anesthetists, emergency physicians, intensivist, pulmonologists, etc.) do have a dual responsibility other than managing the respiratory and related medical devices used in ICUs, emergency departments, pulmonary clinics, etc. Hence, there is a need for a health professional dedicated to closely follow up and manage the respiratory and related component of the management of the critical patients requiring intensive care.

The MSc in Respiratory Care program is to develop leaders in respiratory care, who will be able to influence change, educate other health care providers, conduct research on respiratory and pulmonary illnesses, and develop the respiratory care profession in Yemen. This specialty program is also to be a career advancement program for undergraduates in clinical health science including RT and have been practicing in critical care settings.

Each zonal, regional and referral hospitals need Respiratory therapists but not necessarily at master's level. In few years, undergraduate RT program needs to be launched country wide. For that, we need human resources (educators), contextual evidence based respiratory protocols and practices be developed, respiratory units and clinics are to be set-

up and equipped. This MSc program in RT will be a necessary input to realize the undergraduate program in the country.

Descriptions about the curriculum

Program Mission

To produce competent professional respiratory therapists who are able to provide advanced promotive, preventive, curative and rehabilitative care at all levels of respiratory and respiratory related care system to reduce morbidity and mortality.

Program Aim:

At the end of the training the program will be able to produce respiratory therapists who can provide advanced respiratory care by incorporating evidence-based practice and demonstrate professional, legal and ethical principles using interpersonal relationship and communication skill.

Objectives:

At the end of the training, this program will be able to produce senior respiratory therapists who can;

- Competently give clinical service of the respiratory and related component of the emergency care, intensive care, general wards, and specialized clinics.
- Establish and run the respiratory units of hospitals
- Take part in the administration and organization of respiratory care
- Participate actively in the management of a multidisciplinary team approach
- Promote and maintain optimum standards of allied healthcare and practice in the respiratory environment with respecting patient value, culture, belief and dignity
- Promote safe and healthy environments for patients and staff
- Conduct researches on respiratory care for the provision of evidence based clinical care
- Participate in educational process for the personal and professional development

Manipulate skillfully and maintain instruments and devices used in respiratory therapy and care.

Strategies

- The teaching process will be more of practical and highly integrated.
- Suggested training period will be 24 months
- Training extensively utilizes simulation laboratory
- Trainers are expected to improve clinical service in TMGH and other accredited hospitals
- There must be preceptors at each practicum unit

Hosting institution and department

The program will be hosted and ran by **Deanship of graduate Studies & Scientific Research - 21 September University of Medical & Applied Sciences (21 UMAS),** graduate Section, Program of respiratory care.

Degree Nomenclature

Up on successful completion of this program the graduate will be awarded The Degree of "**Master of Science in Respiratory Care**".

Accreditation of program :

Local accreditation:

Master of Science in Respiratory Care degree accredited by Ministry of Higher Education and Scientific Research.

International Recognition :

Once the program started, the program will be accredited by **IERS -ICRC** (***International Education Recognition System***) that originated from International Council For Respiratory Care.

International academic MsRC programs References :

1. Master of Science in Respiratory Care, Rush University , Chicago , IL , USA.
   Total credit hours = 92 credit hours .
2. Master of Science in Respiratory Care, Texas University , SA , TX , USA.
3. Master of Science in Respiratory Care, Boise State University , Polsi , Idaho , USA.
4. Master of Science in Respiratory Care, Loma Linda University , California , USA
5. Master of Science in Respiratory Care, University of north Carolina , NC, USA.
6. Master of Science in Respiratory Care, Bellarmine University , KY , USA
7. Master of Science in Respiratory Care, University of Mary , North Dakota , USA
8. Master of Science in Respiratory Care, The Ohio state University , Ohio , USA
9. Master of Science in Respiratory Care, Weber state University , Ogden , Utah , USA
10. Master of Science in Respiratory Care, Georgia state University , Atlant , Georgia , USA
11. Master of Science in Respiratory Care, SPHMMC , Addis Ababa , Ethiopia .
12. Master of Science in Respiratory Therapy, Inaya college , Riyadh , Saudi Arabia .
13. Master of Science in Respiratory Therapy, MAHE , Karnataka , India .

Graduates Competencies/ Graduates Profile

After review of existing local and international documents on learning outcomes, the core (essential) competencies respiratory therapy students must demonstrate at the point of graduation are defined. The core competencies are organized in 7 domains:

1. **Basic Clinical Respiratory practice**
2. **Advanced Respiratory Care**
3. **Interpersonal relationships and communication**
4. **Professional, legal, and ethical practice**
5. **Organizational management and leadership skills**
6. **Education and professional development**
7. **Evidence based practice and Respiratory protocol**

1- *Basic Clinical Respiratory Care Practice*

Competency: Respiratory therapists demonstrate respiratory care and practicability in various clinical situations. In order to achieve this outcome, the graduate is expected to:

- Promote and provide family/patient-centered care (K4,S4)

- Demonstrates a holistic approach to patient with respiratory problem while assessing the individual needs when planning patient care and evaluating outcomes (K4,S4)
- Liaises with multidisciplinary teams to plan and implement care based on best practice standards (K4,S4)
- Perform accurate, timely and continuous monitoring of patients, analyzing results and taking appropriate action (K4, S4)
- Implements planned care and ensures accurate and complete documentation of interventions (K4, S4)
- Manages any unforeseen deviations from planned care and records (K, S)
- Employ and initiates appropriate risk management strategies to promote health and safety in the work place (K4,S4)
- Incorporate the principles of aseptic technique towards infection prevention and control in the provision of respiratory care (K4,S4)
- Identify emergency situations and institute corrective actions by being critical thinker and efficient manner (K4.S4)

Below is a detailed clinical competency list in six thematic areas adopted from the competency guidelines of American Association of Respiratory Care (AARC) for Respiratory Therapists:

Area I: Patient Assessment

A. Patient Assessment

1) Complete the assessment through direct contact, chart review, and other means as appropriate and share the information with healthcare team members.
2) Obtain medical, surgical, and family history.
3) Obtain social, behavioral, and occupational history, and other historical information incident to the purpose of the current complaint.

B. Diagnostic Data

1) Review and interpret pulmonary function studies (spirometry) and pulse oximetry.
2) Review and interpret lung volumes and diffusion studies.
3) Review and interpret arterial blood gases, electrolytes, complete blood cell count, and related laboratory tests.

C. Physical Examination

1) Inspect the chest and extremities to detect deformation, cyanosis, edema, clubbing, and other anomalies.

2) Measure vital signs (blood pressure, heart rate, respiratory rate).

3) Evaluate patient breathing effort, ventilatory pattern, and use of accessory muscles.

4) Measure and document oxygen saturation with oximetry under all appropriate conditions (with or without oxygen at rest and during sleep, ambulation, and exercise).

Area II: Collection of Diagnostic Lab Information

A. Pulmonary Function Technology

1) Perform spirometry, including adequate coaching, recognition of improperly performed maneuvers, corrective actions, and interpretation of test results.

2) Compare and evaluate indications and contraindications for advanced pulmonary function tests (plethysmography, diffusion capacity, esophageal pressure, metabolic testing, and diaphragm stimulation) and be able to recognize normal/abnormal results.

3) Sleep Study

4) Compare and evaluate the indications and contraindications for sleep studies.

5) Explain results in relation to types of respiratory sleep disorders.

6) Apply and optimize the use of devices such as CPAP and BiPAP machines to alleviate the sleep disorder related with respiratory system (e.g. OSA management)

B. Invasive Diagnostic Procedures

1) Identify and distinguish the indications, contraindications, and general hazards, complications in preparation, performance, and post care of bronchoscopic procedures.

2) Describe the role of a respiratory therapist in diagnostic bronchoscopy procedures.

3) Monitor and evaluate the patient's clinical condition with pulse oximetry, electrocardiogram, exhaled gas analysis, and other related diagnostic devices.

4) Perform arterial and venous sampling for blood analysis.

Area III: Assessment for Therapeutics

A. Assessment of Need for Therapy – Assesses the need for therapies in all patient settings.

1) Medical gas therapy

2) Humidity therapy

3) Aerosol therapy

4) Lung expansion therapy

5) Airway clearance therapy

6) Airway management

7) Mechanical ventilation

B. Assessment Prior to Therapy

1. Review order and/or implement protocol.
2. Review patient history, laboratory results, and imaging data.
3. Determine indications/contraindications for therapy.
4. Interview and conduct physical examination of patient.
5. Determine appropriateness of order.
6. Determine need for physician intervention.

C. Administration of Therapy

1. Select and assemble equipment.
2. Apply and administer therapy.
3. Monitor patient's response to therapy.
4. Instruct patient on proper technique.
5. Recognize and rectify equipment malfunction (troubleshooting).
6. Follow Standard Precautions for infection control.

D. Evaluation of Therapy

1. Recognize complications and respond to adverse effects.
2. Recommend therapy modifications.
3. Assess therapy effectiveness.
4. Document therapy.

Area IV: Application of Therapeutics to Respiratory Care Practice

A. Medical Gas Therapy – Understanding, application and troubleshooting of the following gas delivery systems but not limited to:

1) compressed gas cylinders.
2) regulators and flow meters.
3) liquid-oxygen systems (stationary and portable).
4) oxygen concentrators (stationary and portable).
5) oxygen conserving devices.
6) high-flow air-entrainment systems.
7) oxygen and air-flow-meter mixing systems.
8) air/oxygen blenders.
9) hyperbaric oxygen systems.
10) sub-ambient oxygen delivery systems (neonatal only)
11) nasal cannulas.
12) high-flow nasal cannulas.
13) non-reservoir masks.
14) reservoir masks.
15) air-entrainment masks.
16) hood/head-enclosures (neonatal only).
17) trans-tracheal oxygen therapy.
18) nitric oxide therapy.

B. helium/oxygen therapy.

C. Humidity Therapy – Understanding, application and troubleshooting of humidity therapy systems in all patient settings.

1) unheated passive humidifiers.
2) active and passive heat-and-moisture exchangers (HMEs).
3) heated humidifiers for medical gas delivery systems via mask, tracheal catheter, and artificial airways.

D. Aerosol Therapy – Understanding, application and troubleshooting of the following aerosol delivery systems.

1) non-medicated, large-volume nebulizers, heated and unheated.

2) Aerosolized medication.

a) Small-volume nebulizers, including ultrasonic and porous/mesh

b) Intermittent, breath-actuated, nebulizers for bronchial challenge testing

3) nebulizers for continuous nebulization.

4) pressurized metered-dose inhalers.

5) dry-powder inhalers.

6) competency in pharmacology nomenclature, physiologic action, adverse effects, and doses.

a) Adrenergics

b) Anticholinergics,

c) Cholinergics

d) Decongestants

e) Mucolytics

f) Pulmonary vasodilators

g) Antimicrobials

7. peak expiratory flow meters and inspiratory flow meters.

8. Calculation and modification of drug dosing.

E. Lung Expansion Therapy – Understanding, application and troubleshooting skills to lung expansion equipment in all patient settings.

1) incentive spirometers (flow-based and volume-based).

2) continuous positive airway pressure (CPAP) devices.

3) expiratory positive airway pressure (EPAP) devices.

4) bi-level positive-pressure breathing.

5) positive expiratory therapy (PEP).

6) oscillatory positive expiratory therapy (OPEP).

7) intermittent positive-breathing devices.

8) bag-valve-mask devices.

F. Airway Clearance Therapy

1) proper positioning for bronchial drainage.

2) chest percussion: manual and mechanical precursors.

3) positive airway pressure adjuncts (vibratory and non-vibratory PEP).

4) expiratory positive airway pressure (EPAP) devices.

5) external chest-wall-vibration devices.

6) Assist the pulmonologist in the therapeutic and diagnostic bronchoscopy.

7) high frequency positive pressures devices.

8) Autogenic drainage systems.

9) Cough-assist devices (insufflator-exsufflator).

G. Airway Management- Apply knowledge, understanding and troubleshooting skills using airway management in all patient settings.

1) Perform the head-tilt chin-lift airway-opening maneuver.

2) Perform the jaw lift without head extension maneuver.

3) the use for an oropharyngeal airway, nasopharyngeal airway, bag-valve-mask resuscitator, laryngeal mask airway (LMA), oral and nasal endotracheal tubes, tracheostomy tube (care and application), tracheostomy "button" or valve.

4) Evaluate, advise and perform the discontinuance or change to alternative airway based on assessment/protocols.

5) tracheostomy tubes care (competency in advising decannulation or change to alternative airway based on assessment/protocols).

6) Evaluate the need and use of tracheostomy "button" or valve

7) Assist physician in placing surgical or percutaneous tracheostomy tube.

8) Suction via artificial airway, operate suction system, select suction catheter.

H. Mechanical Ventilation

1) Incorporate the mechanical ventilation principles listed in critical care.

2) Independently assess the need, initiate and follow up of mechanical ventilation for patients.

3) Evaluate patient on any sort of positive pressure ventilation for weaning and perform weaning trails.

4) Run ABG sampling and tests, interpret the ABG and other lab data and adjust positive pressure ventilation and oxygenation modalities of patients.

5) Perform discontinuation of positive pressure ventilation, decannulation and extubation of patients assisted by the nurse in charge.

6) Apply CPAP devices.

7) Manage the use of bi-level positive airway pressure devices.

8) Manage noninvasive-ventilation interfaces: nasal mask, nasal pillows, oro-nasal mask, full-face mask, and helmet.

I. Post-Acute Care

A. Patient Assessment

a. Assess physical-vital signs, functional capacity.

b. Assess cognitive-level of comprehension, reading level, language barriers.

c. Evaluate social support system-recognition of anxiety, depression, signs of abuse and the knowledge of and ability to access community resources.

B. Environmental Assessment

a. Evaluate the home environment for appropriateness of prescribed therapy and identify risk factors.

b. Educate on oxygen safety to include, but not limited to the presence of fire extinguishers, smoke detectors, smoking cessation, evacuation routes, open flames.

c. Educate on fall safety to include clutter, proper floor surfaces, and adequate lighting.

d. Medication error identification.

e. Educate on infection prevention by disinfecting home medical equipment

f. Identify and discuss electrical safety (e.g., use of power cords/strips, fuses).

g. Identify and discuss structural barriers (e.g., lack of running water, weak floors, and stairs).

C. Therapeutic

a. Evaluate limitations that exist with equipment used in the post-acute care setting.

b. Recommend care plan modifications by recognizing additional needs that exist (e.g., bathroom safety, wheelchairs, electric beds, portable supplemental oxygen delivery systems).

D. Unique Equipment and Monitoring Software

a. Initiate patient monitoring equipment and understand interpretation of data (e.g., infant apnea monitors, pulse oximetry, ETCO2).

b. Apply to practice ventilation modes currently available on ventilators used in the post-acute care setting, invasively and non-invasively.

c. Interpret data available on post-acute care ventilators as well as CPAP/Bi-level devices.

d. Integrate compliance data monitoring respiratory devices remotely.

E. Health Policy

a. Adhere to regulatory requirements (e.g., YMC).

b. Demonstrate knowledge of reimbursement criteria and/or cost allocation for respiratory equipment and supplies based on payer criteria.

Area V: Disease Management

A. Management of Chronic Diseases

1) Understand the etiology, anatomy, pathophysiology, diagnosis, and treatment of cardiopulmonary diseases (e.g., asthma, chronic obstructive pulmonary disease) and comorbidities.

2) Communicate and educate to empower and engage patients.

3) Develop, administer, and re-evaluate patient care plans to

a) establish specific desired goals and objectives.

b) assess level of patient understanding.

c) anticipate the effects of pharmacologic agents on organ systems within scope of respiratory care.

d) identify the patient/caregiver's need for psychosocial, emotional, physical, or spiritual support.

e) educate about nutrition, exercise, wellness.

f) assess and modify the environment.

g) conduct monitoring and follow-up evaluation.

h) develop action plans.

i) apply evidence-based medicine, protocols, and clinical practice guidelines.

j) monitor adherence through patient collaboration and empowerment, including proper and effective device and medication utilization.

k) implement and integrate appropriate patient-education materials and tools.

l) utilize appropriate diagnostic and monitoring tools.

m) document and monitor outcomes (economic, quality, safety, patient satisfaction).

n) communicate, collaborate, and coordinate with physicians, nurses, and other clinicians.

o) assess, implement, and enable patient resources support system (family, services, equipment, personnel).

p) ensure financial/economic support of plan/program and related documentation.

q) educate on dyspnea management and energy conservation.

B. Management of Acute Diseases

1) Develop, administer, evaluate, and modify respiratory care plans in the acute-care setting, using evidence-based medicine, protocols, and clinical practice guidelines.

2) Communicate and educate to empower and engage patients.

3) Develop, administer, and re-evaluate patient care plans to

a. establish specific desired goals and objectives.

b. evaluate the patient.

c. anticipate the effects of pharmacologic agents on organ systems within scope of respiratory care.

d. identify the patient/caregiver's need for psychosocial, emotional, physical, or spiritual support.

e. educate about nutrition, exercise, wellness.

f. assess and modify the environment.

g. conduct monitoring and follow-up evaluation.

h. develop action plans.

i. apply evidence-based medicine, protocols, and clinical practice guidelines.

j. monitor adherence through patient collaboration and empowerment, including proper and effective device and medication utilization.

k. implement and integrate appropriate patient-education materials and tools.

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m. document and monitor outcomes (economic, quality, safety, patient satisfaction).

n. communicate, collaborate, and coordinate with physicians, nurses, and other clinicians.

o. assess, implement, and enable patient resources support system (family, services, equipment, personnel).

p. ensure financial/economic support of plan/program and related documentation.

q. educate on dyspnea management and energy conservation.

Area VI: Emergency and Critical Care

A. Emergency Care

1) Perform advanced cardiovascular life support (ACLS)
2) Perform pediatric advanced life support (PALS) and neonatal resuscitation program (NRP)
3) Perform endotracheal intubation.
4) Perform as a member of the rapid response team (medical emergency team).
5) Participate in mass-casualty staffing to provide airway management, manual and mechanical ventilatory life support, medical gas administration, aerosol delivery of bronchodilators and other agents in the resuscitation of respiratory and cardiovascular failure.
6) Provide intra-hospital transport of critically and chronically ill patients.
7) Provide cardiopulmonary life support and airway control during transport.
8) Apply knowledge of emergency pharmacology.
9) Demonstrate ability to recommend use of pharmacotherapy.

B. Critical Care

1) Apply to practice knowledge and analysis of invasive and noninvasive mechanical ventilators.
2) Apply to practice all ventilation modes currently available on invasive and noninvasive mechanical ventilators, and as adjuncts to the operation of modes.
3) Interpret ventilator data and hemodynamic monitoring data.
4) Manage monitoring system.
5) Manage airway devices.
6) Make treatment recommendations based on waveform graphics, pulmonary mechanics, and imaging studies.
7) Identify therapeutic medical gases.
8) Identify indications for circulatory gas exchange devices.
9) Collaborate with other professionals in care management built upon evidence-based medicine and clinical protocols.
10) Deliver therapeutic interventions based on evidence-based medicine and clinical protocols.

2- *Advanced Respiratory Care*

In addition to the above clinical competencies, masters level Respiratory therapists are to be competent in understanding, assist the critical care team and or independently perform the following clinical procedures :

- Perform Nutritional Assessment and Treatment of the Critically Ill Patient
- Manage advanced Modes of Mechanical Ventilation
- Actively assist in the diagnosis and management of Cardiopulmonary emergencies e.g pneumothorax, pulmonary embolism, drowning, inhalation injury, ARDS, hemoptysis, bronchopleural fistula, head injury, CVA, etc
- Apply BiLevel Ventilation Theory and Application to ARDS patients
- Apply current Evidences in Ventilator management of Trauma Patients
- Use High Flow Oxygen in Acute Respiratory Failure
- Participate in the mobility of patients on respiratory device in and out of ICU
- Assist in ECMO: Extracorporeal Membrane Oxygenation
- Assist Heart-lung machine application
- Perform Interventions to Optimize Oxygenation During Mechanical Ventilation
- Do Mechanical Ventilation Waveform Analysis
- Assist in the diagnosis and management of Pulmonary Hypertension
- Do Respiratory Care of the Morbidly Obese Patient
- Do Setting the Ventilator for Maximum Patient Comfort
- Perform Cardiopulmonary exercise testing (CPET) and full PFT study
- Organize and participate in Pulmonary rehabilitation including respiratory home care modalities

3- *Interpersonal Relationships and Communication*

Competency: Respiratory therapists demonstrate inter-personal relationships and communication practice abilities in various situations. In order to achieve this outcome, the graduate is expected to:

- Provide health education which can support for patient and family
- Establish, apply and maintain effective interpersonal relationships with patients and their family
- Establish essential requirements of effective teamwork to achieve desired

patient care outcomes in the respiratory environment

- Utilize communication strategies both verbal and written to ensure accurate recording and transfer of information in the best interest of patient care

4- *Professional, legal, and ethical practice*

Competency: Respiratory therapists demonstrate Professional, legal and ethical practice abilities in various situations. In order to achieve this outcome, the graduate is expected to:

- Function as a patient advocate in support of the patient's right, dignity, privacy and best interest
- Practice in accordance with rules, regulations and professional guidance relevant to respiratory therapy nursing
- Apply professional accountability and responsibility
- Works within the realms of one's own scope of practice and knowledge base

5- *Organizational management and leadership skill*

Competency: Respiratory therapists demonstrate leadership and managerial qualities and decision-making abilities in various situations. In order to achieve this outcome, the graduate is expected to:

- Plan and implement in relation to staff development
- Use analytical and critical problem-solving skill for decision making
- Recognize and manage complexity and uncertainty in medical practice
- Use effective organizational and management skills in the provision of patient care
- Audit practices to ensure quality assurance of care
- Manage resources appropriately to ensure readiness in the delivery of care
- Demonstrate effective leadership skills.
- Carry-out appropriate reporting and giving feedback
- Demonstrate a habit of self-reflection, responsiveness to feedback and an on-going development of new skills, knowledge and attitude
- Facilitate changes and be a change agent
- Ensure learners are supervised as required
- Effectively co-ordinates the supply material resources, ensuring best practice guidelines are adhered while recognizing the scope of economic constraints

6- *Education and professional development*

Competency: Respiratory therapists demonstrate the need for continuing learning for professional and personal enrichment. In order to achieve this outcome, the graduate is expected to:

- Build his/her professional portfolio, in order to personally develop and meet the knowledge and skill needs of a constantly evolving specialization.
- Demonstrates a commitment to personal and professional development of self and others
- Proactively seeks/provides educational opportunities for self and others
- Maintain a current knowledge and seek new learning experience

7- *Evidence-Based Medicine and Respiratory Care Protocols*

Competency: Respiratory therapists will develop an enquiry mind regarding his/her work and profession and adopt a research attitude, in order to meet the knowledge and skill needs of their specialty. In order to achieve this outcome, the graduate is expected to:

- Evidence-Based Medicine
    a) Retrieve credible sources of evidence.
    b) Critique published research.
    c) Explain the meaning of general statistical tests.
    d) Apply evidence-based medicine to clinical practice.
- Explain the use of evidence-based medicine in the development and application of hospital- based respiratory care protocols
- Evaluate and treat patients in a variety of settings, using the appropriate respiratory care protocols.
- Search, collect, organize and interpret health and biomedical information from different databases.
- Retrieve and use patient-specific information from a clinical data system maintaining confidentiality and protection of individual data.
- Formulate hypotheses, collect and critically evaluate data, for the solution of problems.
- Conduct research and disseminate findings.
- Analyze practice experience and perform practice-based improvement activities using systematic methods.
- Use information technology to manage information, access online medical information
- Reflect and analyze professional practice

Curriculum Model

Competency (outcomes)-based

The curriculum model is competency (outcomes)-based with stated learning outcomes considering learning domains (mostly knowledge and skill). It also includes teaching and learning strategies that are aligned with defined learning outcomes and the assessment methods are explained well.

Student-centered

Students are given greater responsibility for their own learning by integrating a more learner- centered teaching and learning and assessment methods such as problem-based learning, whole group discussion, personal research and reflection exercise and portfolio-based learning.

Integrated

Clinical exposure is linked with theory class and it goes along throughout the training period. The advantages of integration are reducing fragmentation of courses and demonstrating unity of courses, motivating students and shaping their attitude towards the profession, improving educational effectiveness of teaching and learning, encouraging development of higher level objectives, longitudinal coverage of all domains of competencies, promoting staff communication and collaboration and bringing about rationalization of teaching resources.

Modular Course

Modular based course administration: for the core professional courses, modular (block courses) may be used to align with the timing of availability of the guest /contract cardio-respiratory care professionals. And yet, the practical (clinical and simulation) and the theoretical part is given hand in hand.

Systematic and planned learning

In this curriculum, simulation and clinical learning activities are planned and all students gain the necessary experiences for developing essential competencies. The schedules of essential learning activities in the skills learning labs and clinical settings are developed, systematic rotations are proposed and lists of essential skills and procedures to be performed by each student are specified.

Admission to the Program

Application for Admission Requirements:

To be eligible for application for admission to the Master of Science degree in respiratory Care (**MsRC**) program one should fulfill the following criteria:

- Graduated from an accredited college/school with post basic BSc in Nursing, or BSc in Anesthesia (***This criteria only applicable for the first batch***) and for the subsequent batch it should be BSc. in Respiratory Care **only**.
- Has been serving in a clinical environment for the last minimum of two years
- Present letter of sponsorship.
- Two letters of recommendation from the previous clinical work place
- letter of recommendation from RCSA at Ministry of Health.
- Scored pass mark (at least 70%) in the total admission evaluation

NB: Those who have experience in hospital ICUs, emergency units, anesthesia/OR, pulmonary and bronchoscopy units will be privileged; only documented official evidences are acceptable.

Procedure for Application

- The applicants should apply to the office of registrar of college
- The office of the registrar will send the applicants to the supervisor of program
- The respiratory care department will give entrance exam
- The department will select the eligible candidates and notify to the office of the registrar and will be approved by academic commission through the office of registrar.
- Candidates should bring sponsorship letter to registrar office during admission.

Evaluation for Admission:

Evaluation of the prospects for admission will be on point system and includes document evaluation, written exam and admission interviews. 70% pass mark is required for admission.

Evaluation Type	Criteria with remark	Max weight
Document review	• 3 % for CGPA of 70-79.9% • 6% for CGPA of 80-89.9% • 10% for BSc CGPA of ≥ 90%	10%
Experience	• 10% for 5 years and above clinical / teaching RC experience in the privileged clinical areas • 6% for the last 2 -5 years' or more clinical/ teaching experience in the privileged clinical areas • 3% for less than 2 years clinical experience in the privileged clinical areas	10%
Written Exam	• Written exam will have 50% weight • (any one will get 70% or more in written exam)	50%
Candidate Interview	• Oral interview out of 30% (template for structured interview will be used)	30%
TOTAL		**100%**
*A candidate should score 70% in the written exam to pass for the final oral exam (interview)		

Teaching and Learning Methods:

The major teaching and learning methods suggested to be used in the implementation of the curriculum are described below when and where.

1. **Interactive lecture:** Lecture is an efficient way to integrate and present information from multiple sources on complex topics. Additional advantage of lectures is that it gives students a chance to follow and model the way an expert thinks, reasons and asks questions. Lecture is appropriate for teaching knowledge objectives. Interactive lecture is to be used in this curriculum by enhancing engagement of learners mentally and physically using questions, brainstorming, discussion, think-pair-share, debate, role play, case study, providing opportunities for reading, talking, listening, writing and reflecting, and other learner activities.

2. **Case study:** Case studies present realistic scenarios/situations that focus on a specific issue or problem, which may be related to diagnosis or treatment of patients, interpersonal skills or any of a wide range of managerial or organizational problems. Learners typically read, study and react to the case study individually or in small groups. Case studies are important to teach higher order knowledge objectives (application, analysis and synthesis) and critical thinking skills.

3. **Simulated practice (clinical skills lab):** Simulated practice is the use of simulated person, device or set of conditions for instructional purpose. The learner is required to respond to the situation as he or she would under natural circumstances. Simulation complements patient-based education and is best employed to prepare learners for real patient contact. Simulations are used to develop psychomotor, procedural and clinical decision-making skills.

   Simulation also aids development of communication and teamwork skills as well as the ability to respond to medical emergencies systematically. Simulated teaching facilitates learning under the right conditions. Learners receive feedback on their performance, learners having the opportunity for repetitive practice and simulation being an integral part of the curriculum. Clinical skills lab is suggested to be used during the training of the respiratory care curriculum.

4. **Clinical practicum/bed side:** Clinical practicum or clinical teaching is the use of direct patient or client experiences to develop and practice knowledge, skills and attitude required for healthcare delivery or patient care under the supervision of a skilled clinical instructor or preceptor. These skills include generic skills (communication skills, mental and physical examination skills and basic clinical testing and procedural skills), problem- based clinical skills (skills related to patient complaints or diagnoses), discipline-specific clinical skills and continuum of care skills.

   Clinical learning opportunities include placements at a variety of clinical settings for outpatient emergency care, acute care (outpatient and inpatient), Respiratory therapy, chronic care (outpatient and institutional), palliative and end of life care, wellness and preventive care, and population-based healthcare (community, public health). Outpatient departments are appropriate to practice interviewing, interpersonal and counseling skills as well as clinical skills. Inpatient departments are good to teach patient management, practice healthcare delivery skills including documentation of care plan and treatment given and demonstrate management of rarely seen conditions. Clinical teaching and learning uses a variety of techniques including observation, demonstration, role-modeling, practice, coaching, feedback, discussion and reflection.

5. **Laboratory practice:** Students will have opportunities for demonstration, guided practice and coaching in labs to deepen their understanding and apply principles and methods of basic and clinical sciences (gives focus on pulmonary function test and ABG testing and respiratory related sample collection)

6. **Portfolio-based learning:** Portfolio is collection of products collected by the student that provides evidence of learning and achievements related to a learning plan. Portfolio develops self-directed learning and reflective ability. It provides personal and professional educational evidence for student learning, contextualizes learning, links experience with personal interpretation, enhances interactions between students and teachers, allows students to receive feedback, stimulates the use of reflective strategies and expands understanding of professional competence. The basic structure of the portfolio may include:

   a. Title page (giving student's name, year of training and name of the mentor),

b. Contents page (listing what is in the portfolio with page references),

c. List of learning objectives (whose achievement the evidence in the portfolio claims to demonstrate),

d. Short reflective overview (summarizing the learning that has taken place since the last portfolio review, and indicating which items of evidence relate to which learning objectives) and

e. The evidence (probably grouped together into the areas contained in the learning objectives.

Mentoring is crucial for portfolio-based learning to enhance the feedback process and stimulates students' reflections. Students will have one individual mentor until the point of graduation. The aims of the mentoring are to provide feedback, stimulate reflection, support students in compiling portfolio, monitor students' competency development, support students in developing a better awareness and understanding of their strengths and weaknesses, support students in drawing up a learning plan for the coming period and motivate/inspire students, The Mentor will evaluate portfolio of the students per year and hold discussion to provide feedback.

7. **Whole group session**: During the training period, all students and instructors will meet at the end of each course for whole group session. The purpose of the session is to consolidate and reflect on the different learning activities covered during the week. The session is student-centered discussion that will be facilitated by one or more faculty.

8. **Journal club:** A journal club is a group of individuals who meet regularly to discuss the clinical applicability of articles in current respiratory care related journals. It is a popular way to promote the uptake of research evidence into practice. To make it effective, evidence suggests mentoring and brief training of students on how to judge quality of research as well as the use of structured critical appraisal instrument. Journal club is suggested to be implemented during autonomous respiratory practice. This will be implemented after the research methodology lecture.

Assessment methods

Assessment plays a central role in education process: it determines much of the work students undertake affects their approach to learning and is an indication of which aspects of the course are valued most highly. The purposes of assessment are to motivate students to learn, create learning opportunities, to give feedback to students and teachers, grading and quality assurance. There is a formative assessment, which is mainly intended to help the student learn and a summative assessment, which is intended to identify how much has been learned. Formative assessment is most useful part way through the Course and will involve giving students feedback which they can use to improve future performance.

Faculty should conduct at least two formative assessments of each student during a given Course and clinical practice. Summative assessment is used to make a pass/fail or, promotion decision; findings of formative assessment are not used to make pass/fail decisions. Both formative and summative assessments are equally important; however, psychometric rigor is required more from summative assessment strategies. The following principles are considered in selection of assessment strategies and faculty should keep in mind these principles in appraising and revising assessment methods during implementation. Validity and reliability are of utmost importance but it is also recommended to consider feasibility and cost.

a. **Reliability:** Reliability is the reproducibility or consistency or generalizability of assessment scores. An assessment result is said to be reliable if students will get the same score if they re-take the exam. Similarly, for essay type and performance assessment, assessment scores are reliable, if the same results are obtained with different raters. Reliability of assessments can be improved by increasing the number of questions (or cases in clinical performance examination), aiming for middle difficulty questions, writing clear and unambiguous questions and increasing the number of raters.
b. **Validity:** Validity is the ability of an assessment to measure what it is supposed to measure. Validity is not about the method refers to the evidence presented to support or refute the meaning or interpretation assigned to assessment results. Simply put, assessment results are valid if they accurately distinguish competent from incompetent students and if the student who gets "A" grade is actually an "

c. A" student, a student who gets a "B" grade is actually a "B" student; a student who gets an "F" grade is actually an "F" student, etc. Examples of factors that affect validity in

written assessment are too few written questions to sample the content adequately, preparing questions from some chapters, mismatch of assessment questions with content covered in the curriculum, poorly constructed questions, too difficult or too easy questions, rater subjectivity and cheating. For performance (clinical) assessment, too few cases or observations to generalize performance, unrepresentative cases, rater bias, flawed rating scales/checklists and indefensible pass/fail cut off points are threats to validity. Note that reliability is a necessary but not sufficient condition for validity.

Descriptions of the assessment methods

1. **Direct observation of clinical skills (DOCS)**

The purpose of DOCs or mini-clinical evaluation exercise is to assess clinical skills while a student interacts with patients in different settings. Typically, it takes 15-20 minutes and the assessor follows the student with a checklist and gives feedback at the end. The DOCs offers students immediate and ongoing feedback about their observed clinical skill and performance (interviewing skills, physical examination skills, and professionalism, clinical judgment, counseling skills, organization/efficiency and overall clinical competence). At least two DOCs have to be performed by a student in each Course or clinical rotation. This assessment method enables one to follow the progress of the student and will be used for formative assessment.

2. **Objective structured clinical examination (OSCE)**

Objective structured clinical examination (OSCE) is a performance-based exam. During the exam, students are observed and evaluated as they go through a series of 8 or more stations. It allows assessment of multiple competencies. It is **Objective**, because examiners use a checklist for evaluating the trainees; **structured**, because every student sees the same problem and performs the same tasks in the same time frame; **Clinical**, because the tasks are representative of those faced in real clinical situations. These increase the reliability and validity of the assessment. OSCE is a standardized means to assess history taking, physical

examination skill, communication skills, ability to summarize and document findings, ability to make a differential diagnosis or plan treatment, clinical judgment based on patient 's note and procedural skills.

OSCE may use manikins and simulators, standardized patients and real patients. Standardized patients are healthy persons trained to simulate a medical condition. Health science students, health facility staff and faculty may serve as standardized patients. Objective structured practical exam (OSPE) is a variant of OSCE to assess students' knowledge and skill in a non-clinical setting.

3. **Standardized oral exam**

The standardized oral examination is a type of performance assessment using realistic patient cases for questioning the examinee. The examiner begins by presenting a clinical problem in the form of a patient case scenario and asks the examinee to manage the case. Questions probe for requesting clinical findings, interpretation of findings, and treatment plans. In efficiently designed exams each case scenario takes three to five minutes. One or two faculty examines and students are tested on several clinical cases. Oral exam will be part of the summative assessment in final exam at the end of the year.

4. **Written exam**

Written assessments may include different item formats such as multiple-choice questions, matching, true-false, essay and short answer. Written assessment methods will help to evaluate knowledge and understanding of basic, clinical, public health, psychosocial and respiratory therapy sciences and professionalism and ethics. Important point to remember is to ensure written exams assess higher order knowledge in addition to recall and comprehension. Written assessments would be parts of both as formative and summative assessment during the trainings of RT program.

5. **Logbook**

Logbook documentation serves as evidence of scope of patient care and community experience to meet requirements or specific learning outcomes. Maintaining logbook will encourage students to use all learning opportunities for clinical/procedural skills and to fulfill minimum requirement. Regular review of logbook can be used to help the student track what procedures or experiences must be sought to meet requirements. The logbook

document should be counter signed by faculty. The number reported in a logbook may not necessarily indicate competence. Logbook will be part of the formative assessment throughout the respiratory therapy practice.

6. **Portfolio**

Portfolio is collection of papers and other forms of evidence that learning has taken place. It provides evidence for learning and progress towards learning objectives. Reflecting upon what has been learned is an important part of constructing portfolio. In addition to products of learning, the portfolio can include statement about what has been learnt, its application, remaining learning need, how they can be met. Portfolio helps to assess learning outcomes including those that are not easy to assess with other methods like personal growth, self-directed learning, reflective ability, self-assessment of personal growth and professionalism. Portfolio allows assessment of progress towards learning outcomes by using chronological work samples collected at different points in time. Portfolio will be part of the formative assessment throughout the duration of the Respiratory care training and can be used as a summative assessment during professional respiratory care practice.

7. **360° Evaluation**

360° evaluation consists of measurement tools completed by multiple people in a student's sphere of influence. Evaluators usually are faculty, other members of the health care team, peers, patients and family members. Such evaluation can be used to assess interpersonal and communication skills, teamwork ability, management skills, decision-making professional behaviors and some aspects of patient care. It will be used as part of the summative assessment in respiratory therapy care training.

Grading and Promotion

Grading and promotion of students is governed by the university legislation for masters' students.

Grading

- A student should score a minimum make 70 (**B-grade**) to pass a particular course or Course. The grading scale will be used as the table below.

Letter grading	***Grade Equivalent Marks scored***	***Credit Hour Points***	***Remark***
A	≥ 85	4.0	
B+	80-84.9	3.5	
B	70-79.9	3.0	
C+	65-69.9	2.5	
C-	60-64.9	2.0	Not pass mark for major (practicum) Courses and thesis
D	50-59	1.0	Dismissed
F	Below 60	0	

Promotion to next academic semester/year

- Any student who scores a GPA of 3.0 or more than 70 % and above in a semester will be promoted to the next semester.
- Students who score CGPA 2.75-2.99 or 64.9 % both inclusive will be on academic probation. They will be advised to re-take courses with grade of C+ or more .
- Consecutive probations are given for a maximum of two times. A student who has been placed on probation twice shall be dismissed if he/she fails to achieve a CGPA of 3.0. In the next semester, he/she will be at risk for academic dismissal and not be eligible for readmission.
- Any student who scores a GPA below 2.5 in any semesters will be dismissed.
- Only one attempt is allowed for re-exam and retake-course for each course.

Graduation Requirement

Graduation requirement will be according to the rule and regulation of graduate study of **21 September University of Medical & Applied Sciences**. Thus, a student enrolled in this MSc. degree course in respiratory care program is eligible for graduation if and only if he/she:

- Has taken all the required courses for the program and obtained a minimum CGPA of 3.0 or 70 %
- Pass successfully and complete professional practice programs.
- Should successfully defend a ***thesis*** (*a minimum remark of –Good- is required*)
- Present approved and signed log/performance book with a minimum of procedures or cases.

Quality Improvement, Monitoring and Evaluation

Quality assurance will be guided by educational standards and benchmarks defined by the World Federation of Medical Education and the Higher Education Relevance and Quality Agency. The ongoing quality education will be monitored and ensured through:

- Self-review of the educational inputs, processes and outputs (including human resources physical infrastructure, teaching/learning in class, skills lab, clinical settings, student assessment, management and governance and student performance results) semi- annually and taking action. This will be coordinated by the quality assurance committee or team.

- Organizing regular faculty development and support programs on instructional methods, technical updates, leadership, etc. This will be coordinated by the faculty development committee or team.
- Establishment of an assessment committee or team to develop and maintain exam banks and coordinate, review and administer student assessment practices.
- Evaluation of teaching effectiveness by systematic collection of feedback from students midway and at the end of each Course or attachment and use it for program improvement
- Peer and Course/rotation evaluation by instructors at the end of Course delivery
- Assessment of the program by the teaching staff at the end of each semester
- Exit interviews at graduation and for all those who drop out for any reason
- Monitoring students' pass rate in qualification (pre-licensure) exam and comparing it with other respiratory care schools
- Establishing alumni of graduates as a mechanism to assess their career choice and development
- Evaluation of graduates' performance including obtaining feedback from hospital units use the information for program improvement
- Review the curriculum after one batch is graduated

M.Sc. Respiratory Care Employment Areas

- Hospitals (government and private)
- Medical Labs (e.g. Sleep lab, PFT lab)
- Nursing Homes / or Rehabilitation centers
- Colleges & Universities
- Content Writing (medical)
- Clinics (e.g. Asthma clinics, Pulmonology clinics, etc)

Recommended Role of Reparatory Therapist in a Hospital ICU

As a member of the patient care team, RTs assume primary responsibility for all respiratory care including therapeutic and diagnostic procedures. The following are typical roles of a respiratory therapist in a tertiary level setting where there may be Critical care and emergency nurses, ICU nurses, ICU physicians, Intensivist, pulmonologist, anesthetist, etc. just to avoid role conflicts, gaps and overlaps between professional.

- In collaboration with the ICU head nurse and Biomedical engineers, the RT will test and make mechanical ventilators and artificial airway devices ready for application on patients.
- Initiation and follow-up of patients on mechanical ventilation, artificial airways and other respiratory related devices
- Perform airway management procedures including Intubation, weaning from positive pressure supports, and extubation
- ABG puncture and POC blood gas analysis
- Assist with Tracheostomy and Bronchoscopy procedures
- Do Chest physiotherapy and sputum mobilization techniques
- Administer aerosol medications
- Manage and follow-up patient on NIV including nCPAP, NIPPV, nHFOV, etc
- Hemodynamic and pulmonary monitoring of patients in ICU
- Oxygen administration, Humidity therapy, Suctioning and aerosol therapy, theramal regulation procedures, breathing techniques including incentive spirometry, etc
- Assess blood oxygen and CO_2 level of patients
- Assists in maintaining cardiopulmonary stability including dysrhythmia recognition/interpretation, defibrillation, resuscitation, etc.
- Educates patients, families, colleagues, and health care professionals concerning respiratory care
- Member of critical care, blue code and Emergency team of the hospital

NB: Graduates do not have medication prescriptive role.

Resource Profile

Human Resources –Staff Profile

Human Resource	Required	Available	Not Available	Remark / Target Courses
Arab board in Anesthesia or MSc in Critical Care and Emergency, MSc in Respiratory Care	2	>2	0	Mentors, Preceptors and Coordinators
Anesthesiologist	2	>2	0	Respiratory Care Equipment & Techniques , Cardiopulmonary anatomy and Physiology
Pulmonologist	1	>1	0	Pulmonary diseases and Advanced Procedures in Respiratory care, introduction to Respiratory Care,
Cardiologist	1	>1	0	Cardiac diseases.
Intensivist & / or Internists	2	>2	0	Cardiopulmonary diagnostics , Patient Assessment , Respiratory Critical Care , Mechanical Ventilation.
Pharmacologists	1	>1	0	Respiratory Care Pharmacology
Pediatrician	1	>1	0	Neonatal and pediatrics Respiratory Care
Public Health Professionals (MSc/PhD)	2	>2	0	Epidemiology, Biostatistics, Research Methodology, Leadership and Management, Research.
Professional (MSc/PhD)	1	>1	0	Educational methodology
Respiratory Therapist	3	3	0	To be hired on Contract basis. For the core RT profession clinical practice

Simulation or Skill lab

The skill lab will need to have the following equipment and instruments

a. Resuscitation kits including Ambu-bag, masks, defibrillator, etc
b. Mannequin for respiratory system anatomy
c. Mechanical ventilator with accessories including inline suction kits, ET tubes, Trach tubes, etc
d. Portable ventilator x 1
e. In-Exsufflator machine
f. Complete PFT unit items (Spirometery, MIP, DLCO, TLC, etc) x 1
g. Blood gas machine – desktop model with reagent x1
h. Point of care ABG machine with cartridges x1
i. Portable CPAP / BiPAP machine x1
j. Patient monitor with Capnometer, Pulse-oximeter x1
k. Neonatal bubble CPAP unit with accessories
l. Nebulization kits
m. Mucus clearing and chest expansion agents such as chest precursors, incentive spirometers, etc
n. Asthma and COPD Aerosol delivery agents: spacers, peak flow meters, actuators, etc
o. Plethysmography kit (sleep study instruments)

2. Asthma Clinic and Sleep lab are to be established in the university

Course Listings with Credit Hours

Year Semester	Couse code	Course Title / Description	Theory HRs /week	Practice HRs/ week	Credit Hours
First Year - First Semester	RCP-510	Introduction to Respiratory Care	3	-	3
	RCP-511	Cardiopulmonary Anatomy and Physiology	5	-	5
	RCP-512	Cardiac Diseases	4	-	4
	RCP-513	Cardiopulmonary diagnostics	3	-	3
	RCP-514	Respiratory Care Pharmacology	2	-	2
	RCP-515	Patient Assessment	2	-	2
	Semester Total		19		19
First Year - 2nd Semester	RCP-516	Respiratory Care Equipment & Techniques	3	0	3
	RCP-517	Pulmonary Diseases	4	-	4
	RCP-518	Respiratory Critical Care	4	0	4
	MSC -502	Epidemiology	2	-	2
	RCP-519	Mechanical Ventilation	5	-	5
	RCP- 520	Clinical Practicum I	-	12	4
	Semester Total		18	12	22

The 2nd Year					
Year Semester	Couse code	Course Title / Description	Theory HRs /week	Practice HRs/ week	Credit Hours
2nd Year - First Semester	RCP-521	Neonatal and Pediatrics Respiratory Care	3	0	3
	MSC-503	Educational Methodology	2	-	2
	RCP-522	Advanced Procedures in Respiratory Care	3	0	3
	RCP-523	Clinical practice II	-	12	4
	MSC-504	Research Methodology & Project (Starts semester I)	2	12	6
	Semester Total		10	24	18
Second Year - 2nd Semester	RCP-524	Advanced Respiratory Care	2	6	4
	RCP-525	Clinical Practice III	0	12	4
	RCP-527	Sleep Disorders and Polysomnography	4	0	4
	RCP-526	Leadership and Management for Respiratory Care professionals	3	-	3
	Semester Total		9	18	15
Thesis					
Thesis	RCP 600	Thesis in Respiratory care	-	-	6
Total credit hours for the program					80