

**LAST REVIEW: 2009/1010**

**NEXT REVIEW: 2014/2015**

**STATUS:**

**COURSE TITLE: Respiratory Therapy Equipment Lab**

**COMMON COURSE NUMBER: RET 1026L**

**CREDIT HOURS: 1**

**CONTACT HOUR BREAKDOWN**

*(per 16 week term)*

**CLOCK HOURS:**

Lecture:

Lab: **2hrs/week**

Clinic:

Other:

**PREREQUISITE(S): CHM 1032, MAT 1033**

**COREQUISITE(S): RET 1026, RET 1485**

**PRE/COREQUISITE(S):**

**COURSE DESCRIPTION** This course allows the student to work with and master the manipulative skills required to utilize respiratory therapy equipment. Emphasis is on oxygen, humidity and aerosol therapy and airway management.

### **UNIT TITLES**

1. **Cylinders and piping systems**
2. **Oxygen flowmeters, regulators, blenders**
3. **Oxygen administration devices**
4. **Humidity and aerosol devices**
5. **Resuscitation bags, oral airways, nasopharyngeal airways, suction equipment and technique**
6. **Endotracheal tubes, intubation technique, cuff pressures**
7. **In line suction, sputum specimen, extubation**
8. **Tracheostomy care**
9. **Airway clearance devices and techniques**
10. **Vital signs and breath sounds**

### **EVALUATION:**

The course is graded on a pass/fail basis.

Students must complete all lab activities during the semester.

A comprehensive skills assessment at the end of the semester will serve as the final test for successful course completion.

To successfully complete the course the student must master all procedures.

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## UNITS

### Unit 1      **Cylinders and piping systems**

**General Outcome:**

**1.0      The student shall: Describe the piping systems in the hospital setting and the bulk oxygen systems used by hospitals.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 1.1 Identify a bulk supply oxygen storage system and indicate its appropriate location and function.
- 1.2 Describe the piping systems in the hospital setting.
- 1.3 Describe the safety precautions needed for gas cylinders
- 1.4 Identify different gas cylinders and their sizes
- 1.5 Demonstrate the proper use of pin index, DISS and threaded valve outlets
- 1.6 Demonstrate how to backfeed an area of the hospital with oxygen if the piping system malfunctions.
- 1.7 Troubleshoot problems that may develop with cylinders and piping systems

### Unit 2      **Oxygen flowmeters, regulators, blenders**

**General Outcome:**

**2.0      The student shall: Utilize oxygen flowmeters, regulators and blenders.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 2.1 Identify pressure and flow characteristics of Bourdon gauges and Thorpe tube flowmeters.
- 2.2 Demonstrate correct usage of different types of flowmeters
- 2.3 Identify and select proper regulators for each type of gas cylinder.
- 2.4 Describe how a blender functions
- 2.5 Properly set up an oxygen blender

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**Unit 3      Oxygen administration devices**

**General Outcome:**

**3.0      The student shall: Demonstrate proper use of the oxygen devices, oxygen analyzers and pulse oximeters**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 3.1      Demonstrate the proper technique for administering oxygen with each of the following devices:
- simple oxygen masks
  - partial and nonrebreather masks
  - Venturi devices
  - cannulas
  - oxygen tents and hoods
- 3.2      Troubleshoot problems that occur with the oxygen devices
- 3.3      Demonstrate the appropriate technique of oxygen analysis and analyzer calibration.
- 3.3      Demonstrate the proper use of a pulse oximeter; how to recognize correct versus incorrect readings and how to set the alarms.

**Unit 4      Humidity and Aerosol Devices**

**General Outcome:**

**4.0      The student shall:** The student will demonstrate the knowledge and skills needed to provide humidity and aerosol therapy in the clinical setting.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 4.1      Demonstrate the proper technique for utilizing the devices listed below:
- bubble humidifiers
  - wick type humidifiers
  - heat and moisture exchangers
  - Venturi nebulizers
  - High Flow nebulizers
  - ultrasonic nebulizers
  - oxygen tents

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- 4.2 Describe the oxygen concentration and relative humidity available with each of the devices listed above.
- 4.3 Select and modify the equipment needed to provide humidity with each of the following:
  - oxygen administered through normal airways
  - pediatric croup patients
  - bronchodilator therapy
  - artificial airways
  - dual aerosol

**Unit 5 Resuscitation bags, oral airways, nasopharyngeal airways, suction equipment and suction technique**

**General Outcome:**

**5.0 The student shall: Identify, select and demonstrate proper use of the airway management devices on a simulated mannequin.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 5.1 Identify the parts of a resuscitation bag.
- 5.2 Demonstrate proper use and technique for ventilating a patient in need of resuscitation.
- 5.3 Recognize and troubleshoot a malfunctioning resuscitation bag.
- 5.4 Identify oral airways and nasopharyngeal airways
- 5.5 Describe indications and hazards for the use of oral and nasopharyngeal airways.
- 5.6 Identify and setup the equipment needed for suctioning a patient's airway
- 5.7 Demonstrate the proper suction technique for nasotracheally and endotracheally suctioning a patient.

**Unit 6 Endotracheal tubes, intubation technique, cuff pressures**

**General Outcome:**

**6.0 The student shall: Identify and select the correct endotracheal tube for intubation, demonstrate the intubation technique and monitor cuff pressure**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 6.1 Identify the markings on an endotracheal tube.
- 6.2 Demonstrate the proper technique for selecting, inserting, removing and securing endotracheal tubes.

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- 6.3 Describe the necessity for monitoring cuff pressures
- 6.4 Demonstate how to maintain safe endotracheal cuff pressures.

**Unit 7 In line suction, sputum specimen, extubation**

**General Outcome:**

- 7.0 The student shall: Demonstrate proper technique for use of closed system suction catheters, obtaining a sputum specimen and extubation.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 7.1 Describe the function and different types of a closed system suction catheter.
- 7.2 Demonstrate proper use of a closed system suction catheter via an endotracheal tube or tracheostomy tube:
- 7.2 Demonstrate the technique needed for obtaining a sputum specimen via the endotracheal tube and in nonintubated patients
- 7.3 Demosntrate the proper technique for removal of the endotracheal tube
- 7.4 Describe how to successfully maintain a patient's airway post extubation.

**Unit 8 Tracheostomy Tubes**

**General Outcome:**

- 8.0 The student shall: Select, insert and maintain tracheostomy tubes in a patient**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 8.1 Differentiate between fenestrated and non fenestrated tracheostomy tubes and identify the inner cannula, obturator, cuff, pilot balloon and adapter.
- 8.2 Demonstrate the proper technique for inserting, removing and securing tracheostomy tubes.
- 8.3 Demonstrate safe use of a Passy Muir speaking valve.
- 8.4 Demonstrate daily maintenance that is required of tracheostomy tubes in a patient.
- 8.5 Demonstrate proper cuff pressures and describe how an inflated cuff impedes the esophageal lumen.

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**Unit 9      Airway clearance devices and techniques**

**General Outcome:**

**9.0      The student shall: Demonstrate the knowledge and skills needed for airway clearance techniques.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 9.1      Demonstrate proper techniques for positioning, cupping and clapping during chest physical therapy and postural drainage.
- 9.2      Demonstrate the proper technique for performing incentive spirometry, and set goals specific to the patients' height and age.
- 9.3      Discuss the goals and demonstrate the proper technique for positive pressure devices used for airway clearance and atelectasis.

**Unit 10      Vital signs and breath sounds**

**General Outcome:**

**10.0      The student shall: Demonstrate the four vital signs and recite normal values for the infant, pediatric and adult patients**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 10.1      Demonstrate the proper technique for obtaining the pulse in the following locations: femoral, brachial, carotid, and radial arteries
- 10.2      Demonstrate the proper technique for obtaining blood pressure
- 10.3      Demonstrate the proper technique for obtaining respiratory rate.
- 10.4      The student will describe the parts of a stethoscope
- 10.5      The student will identify the proper anatomical landmarks used for chest auscultation
- 10.6      The student will identify normal breath sounds
- 10.7      The student will identify adventitious breath sounds