Miami Dade College

**Course Description**

**RET2274C | Respiratory Care Equipment and Procedures 1 |2.00 credits**

An overview of oxygen and aerosol therapy equipment and procedures normally used for respiratory therapy. Especially emphasized are methods used in medical, surgical, and pediatric patients and their cardiopulmonary physiology as it relates to therapeutic oxygen techniques. Corequisite: RET1024C.

**Course Competencies**

**Competency 1:** The student will describe fundamental physics, gas laws, gas mixtures and partial pressures, humidity, water vapor, evaporation, gases in solution, diffusion, osmosis, flow of gases and other fluids by:

1. Identifying the physical principles that are most important to respiratory physiology and respiratory care.
2. Explaining the behaviors of fluids at various pressures, volumes, temperatures, and flows
3. Describing units of measurement, molecules, and states of matter
4. Discussing physical principles affecting force, stress, pressure, and work
5. Describing compliance, elastance, and resistance and their relationships to the work of breathing
6. Describing surface tension and its relationship to lung function
7. Discussing Boyle's, Charles's, Gay- Lussac's laws
8. Discussing the ideal gas law and explaining how changes in pressure, temperature, and volume affect the behavior of gases
9. Describing applications of physical principles to monitoring, measurement, and assessment of the lung

**Competency 2:** The student will describe the rationale for supplemental oxygen, its limitations and hazards, patient conditions commonly warranting oxygen therapy, administration devices, and dosage regulation, as well as monitoring the physiologic effects and clinical application of oxygen therapy by:

1. Identifying indications for supplemental O2 therapy based on patient history, clinical findings, and physiologic indices
2. Identifying complications of supplemental O2 therapy and methods to prevent of minimize untoward effects
3. Describing the use of gaseous O2 analysis, arterial blood gas measurements, and pulse oximetry monitoring for O2 therapy
4. Developing a logical approach to the therapeutic application of medical gases, including equipment selection, dosage regulation, patient interface, and therapy outcome monitoring
5. Discussing the application of heliox, carbogen, and nitric oxide

**Competency 3:** The student will describe the concepts of humidity, the goals of humidity therapy, devices used for humidification, aerosol generators, and aerosol drug administration by:

1. Describing the average gas warming and humidification functions of the upper airway
2. Listing the goals of aerosol and humidity therapy
3. Comparing active and passive humidifiers
4. Comparing heated and unheated humidifiers

**Competency 4:** The student will describe the concepts of humidity, the goals of humidity therapy, devices used for humidification, aerosol generators, and aerosol drug administration by:

1. Comparing jet nebulizers, ultrasonic nebulizers, pressurized metered dose inhalers, and dry powder inhalers for aerosol drug administration
2. Distinguishing between spacers and holding chambers
3. Discussing issues involved in the selection of a device for aerosol delivery
4. Discussing issues pertinent to aerosol drug delivery during mechanical ventilation

**Competency 5:** The student will describe the concepts of providing oxygen in the home care setting and the necessary equipment by:

1. Discussing issues related to home oxygen administration
2. Comparing home oxygen administration systems
3. Calculating available liquid O2 in pounds, available gaseous O2, and supply duration

**Learning Outcomes:**

1. Communication
2. Numbers / Data
3. Computer / Technology Usage
4. Critical Thinking
5. Information Literacy