



El Camino College  
COURSE OUTLINE OF RECORD – Official

<b>Course Acronym:</b>	RC
<b>Course Number:</b>	290
<b>Descriptive Title:</b>	Advanced Specialty Respiratory Gases
<b>Division:</b>	Health Sciences and Athletics
<b>Department:</b>	Respiratory Care
<b>Course Disciplines:</b>	Respiratory Technologies
<b>Catalog Description:</b>	This course provides instruction in respiratory specialty gases. Topics include the physiology of nitric oxide and heliox specialty gases, indications for use, contraindications, dose and dose titration, hazards, as well as the delivery and monitoring of each gas.
<b>Prerequisite:</b>	
<b>Co-requisite:</b>	
<b>Recommended Preparation:</b>	
<b>Enrollment Limitation:</b>	Students must be admitted to the El Camino College Respiratory Care Program or be graduated from an accredited respiratory care program.
<b>Hours Lecture (per week):</b>	1
<b>Hours Laboratory (per week):</b>	3
<b>Outside Study Hours:</b>	2
<b>Total Course Hours:</b>	72
<b>Course Units:</b>	2
<b>Grading Method:</b>	Letter Grade only
<b>Credit Status:</b>	Credit, degree applicable
<b>Transfer CSU:</b>	Yes
<b>Effective Date:</b>	7-19-2010
<b>Transfer UC:</b>	Yes
<b>Effective Date:</b>	
<b>General Education: ECC</b>	
<b>Term:</b>	
<b>Other:</b>	
<b>CSU GE:</b>	
<b>Term:</b>	
<b>Other:</b>	
<b>IGETC:</b>	
<b>Term:</b>	
<b>Other:</b>	

<p><b>Student Learning Outcomes:</b></p>	<p><b>SLO #1 Specialty Gases</b></p> <p>Students will be able to answer written questions, oral questions and perform procedures that demonstrate knowledge and ability to manage patients receiving specialty gases for various pulmonary disorders.</p> <p><b>SLO #2 Administration of Specialty Gases</b></p> <p>During classes &amp; labs, students will demonstrate and explain appropriate respiratory care techniques and competencies to deliver specialty gases safely and effectively to the patient</p> <p><b>SLO #3 Demonstrate Cognitive Knowledge of RC Specialty Gases</b></p> <p>Students who stay in the course till the end of semester will take a comprehensive final multiple choice examination on use and administration of RC specialty gases and 80% will obtain a grade of 70% or better.</p>
<p><b>Course Objectives:</b></p>	<ol style="list-style-type: none"> <li>1. Describe the physiology of respiratory specialty gases.</li> <li>2. Differentiate the main two specialty gases used in respiratory care.</li> <li>3. Assess when it is appropriate to administer a specialty gas.</li> <li>4. Describe the appropriate method to deliver a specialty gas.</li> <li>5. Identify contraindications and hazards of administering specialty gases.</li> </ol>
<p><b>Major Topics:</b></p>	<p><b>I. Introduction to the Endogenous Physiology of Specialty Gases (1 hour, lecture)</b></p> <p><b>II. Indications for the use of Nitric Oxide (5 hours, lecture)</b></p> <ol style="list-style-type: none"> <li>A. On label usage <ol style="list-style-type: none"> <li>1. Hypoxic respiratory failure</li> </ol> </li> <li>B. Off label usage <ol style="list-style-type: none"> <li>1. Adult Respiratory Distress Syndrome</li> <li>2. Lung transplant</li> <li>3. Heart disease</li> <li>4. Sickle cell disease</li> <li>5. Prevention of chronic lung disease</li> </ol> </li> </ol> <p><b>III. Contraindications of Nitric Oxide (1 hour, lecture)</b></p> <ol style="list-style-type: none"> <li>A. Dependency of right to left shunting</li> <li>B. Left ventricular failure</li> </ol> <p><b>IV. Dose and Dose Titration of Nitric Oxide (1 hour, lecture)</b></p> <ol style="list-style-type: none"> <li>A. Initial dose</li> <li>B. Weaning</li> <li>C. Withdrawal</li> </ol> <p><b>V. Hazards and Complications of Nitric Oxide (1 hour, lecture)</b></p> <ol style="list-style-type: none"> <li>A. Nitrogen dioxide</li> <li>B. Met-hemoglobinemia</li> <li>C. Rebound pulmonary hypertension</li> </ol> <p><b>VI. Delivery and Monitoring of Nitric Oxide (2 hours, lecture)</b></p> <ol style="list-style-type: none"> <li>A. Inhaled nitric oxide ventilation</li> <li>B. Mechanical ventilation</li> <li>C. Non-invasive delivery</li> </ol> <p><b>VII. Mechanisms of action with the use of Heliox (2 hours, lecture)</b></p> <ol style="list-style-type: none"> <li>A. Decrease work of breathing <ol style="list-style-type: none"> <li>1. Decrease airway resistance</li> <li>2. An increase in peak expiratory flow rate</li> </ol> </li> <li>B. Enhance exchange of gases <ol style="list-style-type: none"> <li>1. Increase in partial pressure of arterial oxygen</li> <li>2. Decrease in partial pressure of carbon dioxide</li> </ol> </li> </ol>

	<p><b>VIII. Indications for the Use of Heliox (2 hours, lecture)</b></p> <ul style="list-style-type: none"> <li>A. Upper or lower airway obstruction with an exacerbation of a chronic disease</li> <li>B. Upper or lower airway obstruction from an acute onset (post-extubation stridor or resulting from a respiratory infection)</li> </ul> <p><b>IX. Dose and Dose Titration of Heliox (1 hour, lecture)</b></p> <ul style="list-style-type: none"> <li>A. Initial Dose</li> <li>B. Weaning</li> <li>C. Withdrawal</li> </ul> <p><b>X. Hazards and Complications with the use of Heliox (1 hour, lecture)</b></p> <ul style="list-style-type: none"> <li>A. Dyspnea</li> <li>B. Cardiovascular compromise</li> <li>C. Severe hypoxia</li> </ul> <p><b>XI. Delivery and Monitoring of Heliox (1 hour, lecture)</b></p> <ul style="list-style-type: none"> <li>A. Mechanical ventilation</li> <li>B. Non-invasive delivery, including a non-rebreather mask and Bi Positive Airway Pressure (BIPAP)</li> </ul> <p><b>XII. CLINICAL LAB TO BE ARRANGED HOURS (54 hours, lab)</b></p> <p>Monitoring, charting, delivering specialty gases, and equipment as indicated in the respiratory care of patients under their direct care in hospital intensive care units, emergency rooms and other appropriate locations as assigned.</p>
<b>Total Lecture Hours:</b>	18
<b>Total Laboratory Hours:</b>	54
<b>Total Hours:</b>	72
<b>Primary Method of Evaluation:</b>	2) Problem solving demonstrations (computational or non-computational)
<b>Typical Assignment Using Primary Method of Evaluation:</b>	Write a three- to five-page report on a patient who is in hypoxic respiratory failure. Your paper should encompass the clinical findings for this patient, as well as the appropriate route and dosages - initially, during, and at the end of the treatment. The content of the report will include the contraindications, hazards, and the monitoring needed for using this specialty gas.
<b>Critical Thinking Assignment 1:</b>	Using the information from the lecture, class discussion and your text, identify the need to administer heliox. Propose the appropriate route and dosage for the patient, as well as the information that will need to be monitored during the delivery.
<b>Critical Thinking Assignment 2:</b>	In a one-page paper, explain how nitric oxide can negatively affect the patient and actually worsen the patient's condition.
<b>Other Evaluation Methods:</b>	Class Performance, Completion, Homework Problems, Laboratory Reports, Matching Items, Multiple Choice, Other Exams, Performance Exams, Quizzes, Reading Reports, Term or Other Papers, True/False
<b>Instructional Methods:</b>	Demonstration, Discussion, Group Activities, Guest Speakers, Lab, Lecture, Multimedia presentations
<b>If other:</b>	
<b>Work Outside of Class:</b>	Answer questions, Problem solving activity, Required reading, Study, Written work (such as essay/composition/report/analysis/research)
<b>If Other:</b>	
<b>Up-To-Date Representative Texts:</b>	James Stoller. <u>Fundamentals of Respiratory Care</u> . 13th ed. Elsevier, 2024.
<b>Alternative Texts:</b>	

<b>Required Supplementary Readings:</b>	
<b>Other Required Materials:</b>	
<b>Requisite:</b>	
<b>Category:</b>	
<b>Requisite course(s): List both prerequisites and corequisites in this box.</b>	
<b>Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).</b>	
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<b>Enrollment Limitations and Category:</b>	Students must be admitted to the El Camino College Respiratory Care Program or be graduated from an accredited respiratory care program.
<b>Enrollment Limitations Impact:</b>	Students begin the clinical phase (A.S. degree requirements) of the Respiratory Care program after being accepted into the program.
<b>Course Created by:</b>	Salomay Corbaley
<b>Date:</b>	08/12/2015
<b>Original Board Approval Date:</b>	07/19/2010
<b>Last Reviewed and/or Revised by:</b>	Roy Mekaru
<b>Date:</b>	03/22/2024

<b>Last Board Approval Date:</b>	06/17/2024
<b>Effective Term:</b>	FA 2025