



**El Camino College**  
**COURSE OUTLINE OF RECORD – Approved**

**I. GENERAL COURSE INFORMATION**

**Subject and Number:** Respiratory Care 290  
**Descriptive Title:** Advanced Specialty Respiratory Gases  
**Course Disciplines:** Respiratory Technologies  
**Division:** Health Sciences and Athletics

**Catalog Description:**

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.

**Conditions of Enrollment:**

**Enrollment Limitation:**

Students must be admitted to the El Camino College Respiratory Care Program or be graduated from an accredited respiratory care program.

<b>Course Length:</b>	<b>X Full Term</b>	<b>Other (Specify number of weeks):</b>
<b>Hours Lecture:</b>	<b>1.00 hours per week</b>	<b>TBA</b>
<b>Hours Laboratory:</b>	<b>3.00 hours per week</b>	<b>X TBA</b>
<b>Course Units:</b>	<b>2.00</b>	

**Grading Method:** Letter  
**Credit Status:** Associate Degree Credit

**Transfer CSU:** Yes **Effective Date: 07/19/2010**  
**Transfer UC:** No **Effective Date:**

**General Education:**

**El Camino College:**

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**CSU GE:**

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**IGETC:**

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## II. OUTCOMES AND OBJECTIVES

### A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

#### SLO #1 Specialty Gases

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.

#### SLO #2 Administration of Specialty Gases

During classes & labs, students will demonstrate and explain appropriate respiratory care techniques and competencies to deliver specialty gases safely and effectively to the patient

#### SLO #3 Demonstrate Cognitive Knowledge of RC Specialty Gases

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.

### B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below)

1. Describe the physiology of respiratory specialty gases.
2. Differentiate the main two specialty gases used in respiratory care.
3. Assess when it is appropriate to administer a specialty gas.
4. Describe the appropriate method to deliver a specialty gas.
5. Identify contraindications and hazards of administering specialty gases.

## III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	1	I	Introduction to the Endogenous Physiology of Specialty Gases
Lecture	5	II	Indications for the use of Nitric Oxide A. On label usage 1. Hypoxic respiratory failure B. Off label usage 1. Adult Respiratory Distress Syndrome 2. Lung transplant 3. Heart disease 4. Sickle cell disease 5. Prevention of chronic lung disease
Lecture	1	III	Contraindications of Nitric Oxide A. Dependency of right to left shunting B. Left ventricular failure
Lecture	1	IV	Dose and Dose Titration of Nitric Oxide A. Initial dose B. Weaning C. Withdrawal

Lecture	1	V	Hazards and Complications of Nitric Oxide A. Nitrogen dioxide B. Met-hemoglobinemia C. Rebound pulmonary hypertension
Lecture	2	VI	Delivery and Monitoring of Nitric Oxide A. Inhaled nitric oxide ventilation B. Mechanical ventilation C. Non-invasive delivery
Lecture	2	VII	Mechanisms of action with the use of Heliox A. Decrease work of breathing 1. Decrease airway resistance 2. An increase in peak expiratory flow rate B. Enhance exchange of gases 1. Increase in partial pressure of arterial oxygen 2. Decrease in partial pressure of carbon dioxide
Lecture	2	VIII	Indications for the Use of Heliox A. Upper or lower airway obstruction with an exacerbation of a chronic disease B. Upper or lower airway obstruction from an acute onset (post-extubation stridor or resulting from a respiratory infection)
Lecture	1	IX	Dose and Dose Titration of Heliox A. Initial Dose B. Weaning C. Withdrawal
Lecture	1	X	Hazards and Complications with the use of Heliox A. Dyspnea B. Cardiovascular compromise C. Severe hypoxia
Lecture	1	XI	Delivery and Monitoring of Heliox A. Mechanical ventilation B. Non-invasive delivery, including a non-rebreather mask and Bi Positive Airway Pressure (BIPAP)
Lab	54	XII	TO BE ARRANGED HOURS  CLINICAL LAB 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.
Total Lecture Hours		18	
Total Laboratory Hours		54	
Total Hours		72	

#### IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

##### A. PRIMARY METHOD OF EVALUATION:

Problem solving demonstrations (computational or non-computational)

##### B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

Write a 3-5 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.

##### C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. 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.
2. In a one-page paper, explain how nitric oxide can negatively affect the patient and actually worsen the patient's condition.

##### D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Performance exams

Other exams

Quizzes

Reading reports

Laboratory reports

Class Performance

Homework Problems

Term or other papers

Multiple Choice

Completion

Matching Items

True/False

#### V. INSTRUCTIONAL METHODS

Demonstration

Discussion

Group Activities

Guest Speakers

Laboratory

Lecture

Multimedia presentations

**Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.**

**VI. WORK OUTSIDE OF CLASS**

- Study
- Answer questions
- Required reading
- Problem solving activities
- Written work

**Estimated Independent Study Hours per Week: 2**

**VII. TEXTS AND MATERIALS**

**A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS**

Robert L. Wilkins. Fundamentals of Respiratory Care. 10th ed. Elsevier, 2013. Discipline Standard

**B. ALTERNATIVE TEXTBOOKS**

**C. REQUIRED SUPPLEMENTARY READINGS**

**D. OTHER REQUIRED MATERIALS**

**VIII. CONDITIONS OF ENROLLMENT**

**A. Requisites (Course and Non-Course Prerequisites and Corequisites)**

Requisites	Category and Justification
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**B. Requisite Skills**

Requisite Skills
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**C. Recommended Preparations (Course and Non-Course)**

Recommended Preparation	Category and Justification
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**D. Recommended Skills**

Recommended Skills
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**E. Enrollment Limitations**

Enrollment Limitations and Category	Enrollment Limitations Impact
Students must be admitted to the El Camino College Respiratory Care Program or be graduated from an accredited respiratory care program.	Students begin the clinical phase (A.S. degree requirements) of the Respiratory Care program after being accepted into the program.

**Course created by Salomay Corbaley on 04/23/2010**

**BOARD APPROVAL DATE: 07/19/2010**

**LAST BOARD APPROVAL DATE: 05/18/2020**

**Last Reviewed and/or Revised by: Roy Mekar**

**Date: 2/2/2020**

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