



# Broward Community College

## Course Outline

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STATUS: A

**COMMON COURSE NUMBER:** RET 2503C

**COURSE TITLE:** Advanced Cardiopulmonary Pathophysiology

**CREDIT HOURS:** 2

**CONTACT HOUR BREAKDOWN:**

Lecture/Discussion: 2

Laboratory: 00

Other 00

**CONTACT HOURS/WEEK:** 2

**CATALOG COURSE DESCRIPTION:**

This course provides an in-depth examination of the most commonly encountered cardiopulmonary diseases from the physician's clinical perspective. Emphasis is placed on pathology, physical examination, diagnosis and clinical management.

Prerequisite: RET 2418, RET 1833L

Corequisite: RET 1714, RET 2414, RET 2834L

General Education Requirements - Associate of Arts Degree, meets Area(s):  
none

General Education Requirements - Associate in Science Degree, meets  
Area(s): none

**UNIT TITLES:**

1. Pulmonary anatomy and physiology
2. Blood gas analysis
3. Pulmonary physical examination
4. Chronic obstructive pulmonary disease

I. **Course Overview:**

Upon successful completion of this course, the students should be able to

II. **Units:**

**Unit 1. Pulmonary anatomy and physiology**

**GENERAL OUTCOME:**

1.0 The student will identify the location and function of all pulmonary and thoracic structures.

**SPECIFIC LEARNING OUTCOMES:**

To successfully complete this unit the student will:

1.1 Identify the location and function of:

intercostal muscles	diaphragm
submucosal glands	goblet cells
cilia	mucus
lung segments	lobes
large airways	small airways
cartilage	smooth muscle
nose	pharynx
larynx	alveoli
hilum	carina
visceral pleura	parietal pleura

1.2 Differentiate between dead space and alveolar ventilation.

1.3 differentiate between anatomic and alveolar dead space.

1.4 Differentiate the causes and effects of shunts and  $\dot{V}_a/\dot{Q}_c$  mismatch.

## Unit 2. Blood gas analysis

### GENERAL OUTCOME:

2.0 The student will identify normal and abnormal oxygenation and acid base values and associate diseases with blood gas disorders.

### SPECIFIC LEARNING OUTCOMES:

To successfully complete this unit the student will:

2.1 List the normal values for:

$\bar{P}aO_2$	$\dot{P}vO_2$	$P_{A}O_2$	$V\dot{C}O_2$	pH
$\bar{S}aO_2$	$\dot{S}vO_2$	$P(A-a)O_2$	$V\dot{O}_2$	$PaCO_2$
$\bar{C}aO_2$	$\dot{C}vO_2$	$C(a-v)O_2$	$V_A/Q_C$	

2.2 Calculate cardiac output and shunt fraction using the information listed above.

2.3 Use the alveolar air equation to calculate  $P_{A}O_2$ .

2.4 Calculate oxygen content when given hemoglobin content,  $P_{O_2}$  and saturation.

2.5 Given any two of the following,  $\dot{Q}$ ,  $\dot{V}O_2$ ,  $C(a-v)O_2$ , calculate the third.

2.6 Draw the oxyhemoglobin dissociation curve and indicate the  $P_{O_2}$  which corresponds to each of the following saturations: 50%, 75%, 90%, 95%

2.7 Describe how hypoventilation,  $V_A/Q_C$  mismatch and shunts affect blood oxygenation and  $P(A-a)O_2$ .

2.8 Define acids, bases and buffers.

2.9 Write the Henderson-Hasselbach equation and use it to calculate pH when given  $HCO_3:C0_2$  ratios.

2.10 Describe the anion gap and identify the primary electrolyte changes associated with metabolic abnormalities.

2.11 When given abnormal blood gas values, classify the abnormality, list the probable causes and describe appropriate corrective measures.

### **Unit 3. Pulmonary physical examination**

#### GENERAL OUTCOME:

3.0 The student will describe the process involved in a comprehensive pulmonary physical examination

#### SPECIFIC LEARNING OUTCOMES:

To successfully complete this unit the student will:

3.1 Describe inspection, palpation percussion and auscultation as they relate to the pulmonary examination.

3.2 Describe normal breath sounds for each area of the chest.

3.3 Describe all adventitious breath sounds and identify the diseases with which they are usually associated.

### **Unit 4. Chronic obstructive pulmonary disease**

#### GENERAL OUTCOME:

4.0 The student will identify the pathologic changes common to chronic obstructive pulmonary disease and the diagnostic and therapeutic techniques used for COPD.

#### SPECIFIC LEARNING OUTCOMES:

To successfully complete this unit the student will:

4.1 Describe the role of inflammation, spasm and airway collapse in obstructive disorders.

4.2 Describe the pulmonary function characteristics common to the obstructive diseases.

4.3 Describe the primary clinical and laboratory characteristics associated with the obstructive disorders.