# RSPT 60C: PULMONARY DIAGNOSTICS

### Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2022
Units:	3
Hours:	2.5 lecture, 2 laboratory per week (54 total per quarter)
Prerequisite:	RSPT 51C.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade Only
Repeatability:	Not Repeatable

#### **Student Learning Outcomes**

- Relate results to disease process and recommends appropriate therapy.
- · Perform selected cardio-pulmonary diagnostic tests.

### Description

Selection, performance, and interpretation of tests used to diagnose cardiopulmonary abnormalities. Intended for students in the Respiratory Therapy Program; enrollment is limited to students accepted into the program.

### **Course Objectives**

The student will be able to:

- 1. Identify and describe pulmonary function testing fundamentals
- 2. Interpret blood gases and related tests
- 3. Describe the uses and limitations of cardiopulmonary exercise testing
- 4. Describe metabolic studies and discuss their uses and limitations
- 5. Identify important aspects of bronchoscopy related to the diagnosis of lung disease
- 6. Discuss the importance of quality control procedures

#### **Course Content**

- 1. Pulmonary function testing fundamentals
  - a. Indications for pulmonary function testing
  - b. Pulmonary function equipment basics
  - c. Spirometry and related tests
    - i. Flow/volume loops in pulmonary diagnosis
    - ii. Flow/time tracings for specific disease states
  - d. Bronchial provocation
    - i. Methacholine challenge
  - e. Measuring lung volumes
    - i. Plethysmography
    - ii. Helium dilution
    - iii. Nitrogen washout and discuss its uses
  - f. Distribution indices
  - g. Diffusing measurement

- h. Resistance and compliance measurement
- i. Calculations and application of norms
- i. Individual variations
- ii. Racial influences on test results
- 2. Blood gases and related tests
  - a. Collection and interpretation of arterial blood gases
  - b. Non-invasive measurements in pulmonary medicine i. Pulse oximetry
    - ii. Capnography
  - c. Blood gas analyzers
    - i. Standard analyzers
    - ii. Point of care analyzers
- 3. Cardiopulmonary exercise testing
  - a. Exercise protocols
  - b. Testing monitoring
- 4. Metabolic studies
  - a. Oxygen consumption measurement
  - b. Carbon dioxide production
- 5. Bronchoscopy
  - a. Indications and hazards related to bronchoscopy
  - b. Preparation of the patient for bronchoscopy
  - c. Procedures that may be performed with bronchoscopy
- 6. Quality control procedures
  - a. Calibration of pulmonary diagnostic equipment
  - b. Cleaning and sterilization techniques for pulmonary diagnostic equipment
  - c. Criteria for acceptability of results of pulmonary function tests

### Lab Content

- 1. Students will learn hands-on how to perform pulmonary function tests, including:
  - a. Indications for pulmonary function testing
  - b. Equipment basics including calibration
  - c. Spirometry and related tests
    - i. Flow/volume loops
    - ii. Flow/time tracing
  - d. Students will learn the concepts and indications for bronchial provocation tests
    - i. Methacholine challenges for diagnostic purposes
  - e. Students will perform lung volume measurements, including:
    i. Plethysmography
    - ii. Helium dilution
    - iii. Nitrogen washout
  - f. Students will learn about distribution indices
  - g. Students will learn diffusion measurements
  - h. Resistance and compliance measurement
  - i. Calculations and application of norms i. Individual variations
    - ii. Racial influences on test results
- 2. Blood gases and related tests
  - a. Arterial blood gases: collection and interpretation
  - b. Non-invasive measurements
    - i. Pulse oximetry
    - ii. Capnography
  - c. Principles of operation of blood gas analyzers

- i. Standard analyzers
- ii. Point of care analyzers
- 3. Cardiopulmonary exercise testing
  - a. Exercise protocols
  - b. Monitoring
- 4. Metabolic studies
  - a. Oxygen consumption
  - b. Carbon dioxide production
  - c. Calorimetry
- 5. Students will be able to describe bronchoscopy procedures
  - a. Indications and hazards
  - b. Preparation of the patient
  - c. Procedures that may be performed
- 6. Students will learn quality control procedures, including:
  - a. Calibration and maintenance
    - i. Gas analyzers
    - ii. Spirometers and lung volume equipment
  - b. Cleaning and sterilization
  - c. Criteria for acceptability of results

## **Special Facilities and/or Equipment**

 Laboratory with diagnostic equipment, supplies, compressed gas, cleaning/disinfection capability and storage facilities.
 Lecture facility with overhead projector/computer and internet access.

3. When taught online, students must have access to a computer with internet access.

# Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Quizzes and midterm Lab assignments Written final exam

### **Method(s) of Instruction**

Methods of Instruction may include but are not limited to the following:

Lecture Lab demonstration

### Representative Text(s) and Other Materials

Mottram, Carol. <u>Ruppel's Manual of Pulmonary Function Testing, 11th</u> ed., 2016.

While this text is over five years old, it still represents the standard in the field.

#### Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

Assigned reading from textbook: approximately one chapter per week, averaging 30 pages.

# Discipline(s)

**Respiratory Technologies**