

# COURSE SYLLABUS

<b>LAST REVIEW</b>	Spring 2021
<b>COURSE TITLE</b>	Cardiopulmonary Care & Diagnostics I
<b>COURSE NUMBER</b>	RSCR 0225
<b>DIVISION</b>	Health Professions
<b>DEPARTMENT</b>	Respiratory Therapy
<b>CIP CODE</b>	51.0908
<b>CREDIT HOURS</b>	4
<b>CONTACT HOURS/WEEK</b>	Class: 4
<b>PREREQUISITES</b>	None
<b>COURSE PLACEMENT</b>	This course is part of a selective admission program. Students must be admitted to the Respiratory Therapy program to enroll in this course.

## COURSE DESCRIPTION

This is an introductory overview course in which students engage content on cardiopulmonary anatomy, physiology, and disease states. Students become familiar with patient assessment concepts, evaluate diagnostic data, recognize cardiopulmonary diseases, and identify initial interventions. Course material is applied to clinically focused scenarios and discussion questions.

## PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:

[https://kansasregents.org/workforce\\_development/program-alignment](https://kansasregents.org/workforce_development/program-alignment)

## PROGRAM LEARNING OUTCOMES

1. Formulate the knowledge and critical reasoning skills necessary to pass the National Board for Respiratory Care Therapist Multiple Choice Exam.
2. Execute the variety of assessment and intervention skills necessary to provide respiratory care in the clinical setting at the entry Registered Respiratory Therapist level.
3. Integrate professional behaviors necessary at the entry Registered Respiratory Therapist level.

## TEXTBOOKS

<http://kckccbookstore.com/>



## **METHODS OF INSTRUCTION**

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

## **COURSE OUTLINE**

- I. Pulmonary Mechanics
  - A. Ventilation versus respiration
  - B. Role of the diaphragm
  - C. Diaphragmatic movements
  - D. Static compliance
  - E. Dynamic compliance
  - F. Pulmonary surfactant
  - G. Atelectasis
  - H. Elastic tension
  - I. Passive dilation
  - J. Passive constriction
  - K. Tidal volume
  - L. Frequency
  - M. I:E ratio
  - N. Deadspace
  - O. Surface tension
  - P. Resistance
  
- II. Respiratory Anatomy & Physiology
  - A. Structures of the upper airway
    - 1. Nose
    - 2. Larynx
    - 3. Pharynx
  - B. Structures of the lower airway
    - 1. Tracheobronchial tree
    - 2. Lobule
    - 3. Alveoli
    - 4. Blood supply
    - 5. Surfactant
    - 6. Clearing mechanisms
  - C. Structures of the thorax
    - 1. Skeletal structures
    - 2. Muscles of ventilation
  - D. Respiratory physiology
    - 1. Autonomic nervous system
    - 2. Pontine respiratory centers

3. Monitoring systems influencing the medulla
4. Reflexes that influence ventilation
5. Oxygen transport
6. Oxyhemoglobin dissociation curve
7. PaO<sub>2</sub> vs SpO<sub>2</sub>

### III. Cardiopulmonary Diseases/Pathophysiology

#### A. Asthma

1. Classic characteristics
2. Status asthmaticus
3. Pathology of airway resistance
4. Immune responses
5. Beta blockade theory
6. Lab results
7. ABG progression
8. Asthma treatments
9. Course and prognosis

#### B. Bronchitis

1. Chronic Obstructive Pulmonary Disease (COPD)
2. Types of bronchitis
3. Signs and symptoms
4. Etiology
5. ABG progression
6. "Blue Bloater"
7. Physical exam
8. Treatment of chronic bronchitis

#### C. Emphysema

1. Etiology
2. Alpha 1 antitrypsin deficiency
3. Clinical manifestations
4. "Pink Puffer"
5. Bulla
6. Acinus
7. Course and prognosis

#### D. Pneumonia

1. Diagnostic factors
2. Lung structures effected
3. Types of pneumonia
4. Acuity
5. Sputum production
6. Host factors
7. Classic complaints
8. Breath sounds
9. Antibiotics



#### IV. Cardiopulmonary Pharmacology

- A. Sympathomimetics
  - 1. Catecholamines
  - 2. Catecholamine derivatives
- B. Parasympatholytics
- C. Methylxanthines
- D. Anticholinergics
- E. Glucocorticoid steroids
- F. Adrenergic receptor sites
- G. Handling adverse reactions

#### V. Cardiopulmonary Diagnostic Screening Tests

- A. Morbidity and mortality tables
- B. Wellness education
- C. Risk factors for pulmonary disease
- D. Patient interviews
- E. Patient medical histories
- F. Aerobic exercise
- G. Target heart rate and monitoring during exercise
- H. Nomograms of predicted values
- I. Peak expiratory flow rates
- J. Forced expiratory volumes
- K. Forced vital capacity
- L. Oximetry changes with activity
- M. Blood chemistry values

#### VI. Decision Making Tools

- A. Evidence based sources
- B. Charts and tables
- C. Graphs, flow diagrams, algorithms
- D. Collecting, analyzing, interpreting patient data

#### VII. Patient Assessment Technique

- A. Chest assessment
  - 1. Inspection
  - 2. Auscultation
- B. Tactile and vocal fremitus
- C. Breath sounds
- D. Cyanosis
- E. Vital sign changes
- F. Barrel chest
- G. Pursed lip breathing
- H. Cor pulmonale
- I. Accessory muscle use

- J. Cough production
- K. Digital clubbing
- L. Hemoptysis
- M. Retractions
- N. SOAP notes
- O. Care plans

## VIII. Wellness and Health Education

### A. Chronic Obstructive Pulmonary Disease (COPD)

1. COPD causes
2. Medications
3. Oxygen in the home
4. Home care equipment
5. Exercise
6. Pneumonia vaccine
7. Flu vaccine

### B. Asthma

1. Allergic triggers
2. Lung irritants
3. Infections
4. Physical exertion
5. Excitement
6. Medications
7. Peak expiratory flow rate monitoring

### C. Tuberculosis

1. Spread of infection
2. Risk factors
3. Symptoms
4. Skin testing
5. Treatment

### D. Indoor air pollution

1. Carbon monoxide
  - a. Second hand smoke
  - b. Car fumes
2. Adequate air exchange and ventilation

### E. Sleep apnea

1. Signs and symptoms
2. Testing

## IX. Smoke Cessation Education

- A. Nicotine
- B. Addiction

## **COURSE LEARNING OUTCOMES AND COMPETENCIES**

Upon successful completion of this course, the student will:

- A. Evaluate and assess pulmonary lung mechanics.
  - 1. Evaluate and assess the role of the diaphragm
  - 2. Calculate lung compliance.
  - 3. Evaluate and assess the role of pulmonary surface in the lung
  - 4. Evaluate and assess respiratory rate
  - 5. Calculate tidal volume.
  - 6. Calculate I:E ratios.
  - 7. Calculate alveolar ventilation.
- B. Evaluate and assess respiratory anatomy and physiology.
  - 8. Identify the structures and function of the upper the upper airway, i.e. the larynx and the pharynx
  - 9. Identify the structure and function of the lower airway, i.e. lobules and alveoli.
  - 10. Evaluate and assess the function of the autonomic nervous system.
- C. Evaluate and identify the pathophysiology of Cardiopulmonary Diseases.
  - 11. Evaluate and identify asthma.
  - 12. Evaluate and identify chronic bronchitis.
  - 13. Evaluate and identify emphysema.
  - 14. Evaluate and identify pneumonia.
  - 15. Evaluate and identify Tuberculosis.
- D. Identify Cardiopulmonary Pharmacology.
  - 16. Identify adrenergic agents.
  - 17. Identify anti-leukotrienes agents.
  - 18. Identify anticholinergic agents.
  - 19. Identify corticosteroid agents.
  - 20. Interpret patient response to pharmacologic intervention.
- E. Evaluate and perform Cardiopulmonary Diagnostic Screening Tests.
  - 21. Evaluate and perform a peak expiratory flow maneuver.
  - 22. Evaluate and perform a force vital capacity maneuver.
  - 23. Evaluate and perform a negative inspiratory force maneuver.
  - 24. Differentiate restrictive and obstructive pulmonary functions values.
  - 25. Evaluate and perform a 6-minute walk test.
  - 26. Evaluate chest x-ray data values.
  - 27. Evaluate and collect complete blood count (CBC) i.e. Hgb/HCT, RBC, WBC and ABG.
- F. Collect and evaluate peer-reviewed data.
  - 28. Collect, evaluate, analyze and interpret evidence based resources synthesize a research report on cardiopulmonary diseases.





- G. Evaluate and perform a patient assessment.
  - 29. Evaluate and perform vital signs, i.e. Pulse and respiratory rate.
  - 30. Evaluate and perform chest auscultation.
  - 31. Identify a barrel chest.
  - 32. Identify accessory muscle use.
  - 33. Identify digital clubbing.
  
- H. Evaluate and analyze wellness and health programs.
  - 34. Evaluate and analyze causes of COPD, asthma and TB.
  - 35. Evaluate and analyze medication to treat COPD, asthma and TB.
  - 36. Evaluate and analyze the need for home oxygen in COPD.
  - 37. Evaluate and analyze the home care equipment COPD.
  - 38. Evaluate and analyze the use of peak flow monitoring in asthma
  - 39. Evaluate and analyze the spread of TB infection.
  - 40. Evaluate and analyze the signs and symptoms of TB
  - 41. Evaluate and analyze sleep apnea testing.
  
- I. Evaluate and assess smoking cessation education.
  - 42. Evaluate the effects of nicotine addiction on smoking cessation.

## **ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES**

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

## **COLLEGE POLICIES AND PROCEDURES**

*Student Handbook*

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

*College Catalog*

<https://www.kckcc.edu/academics/catalog/index.html>

*College Policies and Statements*

<https://www.kckcc.edu/about/policies-statements/index.html>

*Accessibility and Accommodations*

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.