

**STATE UNIVERSITY OF NEW YORK  
COLLEGE OF TECHNOLOGY  
CANTON, NEW YORK**

**COURSE OUTLINE**

**PHTA 204 -Cardiopulmonary and Integumentary Pathologies**

**PREPARED BY: Deborah S. Molnar**

**SCHOOL OF SCIENCE, HEALTH, AND CRIMINAL JUSTICE  
Physical Therapist Assistant Program  
Revised May 2015**

**PHTA 204 - Cardiopulmonary and Integumentary Pathologies**

- A. TITLE: Cardiopulmonary and Integumentary Pathologies
- B. COURSE NUMBER: PHTA 204
- C. CREDIT HOURS: 4 credit hours
- D. WRITING INTENSIVE COURSE : No
- E. COURSE LENGTH: 15 weeks
- F. SEMESTER(S) OFFERED: Fall semester
- G. HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:  
3 hours lecture, 2 hours lab per week

H. CATALOG DESCRIPTION:  
Fall, 4 credit hours  
In the first half of the semester students will study the cardiopulmonary system and related pathologies. Cardiopulmonary rehabilitation principles and management will be discussed and applied. Students will learn about diabetes and peripheral vascular disease as a lead-in to amputee and prosthetic rehabilitation. Management of injuries to the integumentary system, including wounds, burns, and edema will be studied. 3 hours lecture, 2 hours lab per week

I. PRE-REQUISITES/CO-COURSES:  
Pre-requisites: All first year PTA curriculum.  
Co-requisites: None

J. **Course Goals (Student Learning Outcomes):** At the end of this course, the student will be able to:

<i>Course Objective</i>	<i>Institutional SLO</i>
1. Apply knowledge of anatomy and physiology to thoroughly understand clinical presentation, medical management, and principles of rehabilitation for: <ul style="list-style-type: none"> <li>a. Cardiopulmonary Pathologies</li> <li>b. Peripheral Vascular Disease</li> <li>c. Amputations</li> <li>d. Diabetes Mellitus</li> <li>e. Integumentary Injuries</li> <li>f. Lymphedema</li> </ul>	#3 Prof Comp
2. Demonstrate effective education to patients and caregivers regarding their cardiopulmonary and integumentary pathologies and rehabilitation.	#1 Communication #3 Prof Comp #4 Inter/Intra Pers Skills
3. Appropriately instruct patients with amputation,	#1 Communication

cardiopulmonary, or integumentary pathology in rehabilitation techniques based on the physical therapy plan of care.	#3 Prof Comp #4 Inter/Intra Pers Skills
4. Demonstrate comprehension of the physical therapy plan of care for patients with cardiopulmonary and integumentary pathologies and amputations, through case scenario implementation.	#2 Critical Thinking #3 Prof Comp
5. Demonstrate awareness of changes in cardiopulmonary or integumentary status and make appropriate decisions using the Problem Solving Algorithm for the PTA.	#1 Communication #2 Critical Thinking #3 Prof Comp #4 Inter/Intra Pers Skills
6. Demonstrate effective communication skills while acting as a student PTA during lab competencies and practicals.	#1 Communication #3 Prof Comp #4 Inter/Intra Pers Skills
7. Produce clear, accurate, concise, timely, and legible documentation.	#1 Communication #3 Prof Comp
8. Recognize individual and cultural differences and respond appropriately through case scenario implementation.	#3 Prof Comp #4 Inter/Intra Pers Skills
9. Recognize appropriate response to emergency situations related to the patient with diabetes and cardiopulmonary pathology.	#2 Critical Thinking #3 Prof Comp
10. Describe effective interaction with appropriate members of the healthcare team during case scenario implementation.	#1 Communication #3 Prof Comp #4 Inter/Intra Pers Skills
11. Provide accurate billing following case scenario implementation.	#1 Communication #3 Prof Comp
12. Demonstrate competency in performing physical therapy interventions related to rehabilitation of the patient with cardiopulmonary and/or integumentary pathology, including: <ul style="list-style-type: none"> <li>a. Airway Clearance Techniques</li> <li>b. Application of Devices and Equipment</li> <li>c. Functional training</li> <li>d. Biophysical agents</li> <li>e. Therapeutic exercise</li> <li>f. Wound management</li> </ul>	#3 Prof Comp
13. Demonstrate competency in performing data collection techniques related to management of the patient with cardiopulmonary and integumentary pathology, during case scenario implementation.	#3 Prof Comp
14. Maintain safe working environment and assures safety of patient and self during all interactions.	#3 Prof Comp

J. TEXTS:  
O’Sullivan, S.B., Schmitz, T.J., Fulk, G.D. (2014) *Physical Rehabilitation*, Philadelphia: F.A. Davis.  
Michlovitz, (2012) *Modalities for Therapeutic Intervention*, Philadelphia: F.A. Davis.

K. REFERENCES:  
Lescher, P. (2011) *Pathology for the Physical Therapist Assistant*, Philadelphia: FA Davis.  
Kisner, C, Colby (2007) *Therapeutic Exercise: Foundations and Techniques*, Philadelphia: F.A. Davis.  
Myers, B.A., (2008) *Wound Management: Principles and Practice, 2<sup>nd</sup> Ed.*, Myers, B.A., New Jersey: Pearson.

L. EQUIPMENT:  
wound simulation equipment, intermittent compression pump, cardiovascular equipment, exercise equipment, data collection tools, treatment tables, amputee simulation equipment, assistive devices, basic PT supplies, videos/DVDs

M. GRADING METHOD :  
Students will be assigned a letter grade based on the college grading system A-F.  
Students must obtain a 75% in both the lecture and laboratory component of the course to pass the course.

Conversion of a number grade to a letter grade is as follows:

A	=	90-100	C	=	70-74
B+	=	85-89	D+	=	65-69
B	=	80-84	D	=	60-64
C+	=	75-79	F	=	below 60

N. MEASUREMENT CRITERIA/METHODS:  
Written examinations, quizzes, lab competencies, lab practicals, homework assignments.

O. DETAILED COURSE OUTLINE:

- I. Cardiopulmonary Anatomy and Physiology
  - A. Cardiovascular System
    - 1. Heart Anatomy and Blood Supply
    - 2. Basic Functions of Cardiovascular System
    - 3. Cardiac Tests
      - a. Lab Tests
      - b. ECG
      - c. Telemetry
      - d. Stress Tests
      - e. Echocardiogram
      - f. Catherizations
    - 4. Surgical Interventions

- a. Angioplasty
      - b. CABG
      - c. Pacemaker Insertions
    - B. Pulmonary System
      - 1. Structure and Function
        - a. Thorax
        - b. Muscles of Respiration
        - c. Mechanics of Respiration
        - d. Anatomy of Respiratory Tracts and Lungs
        - e. Basic Functions of the Respiratory System
      - 2. Pulmonary Tests
        - a. Sputum Analysis
        - b. Blood Tests
        - c. Pulse Oximetry
        - d. Chest X-ray
        - e. Pulmonary Function Tests
      - 3. Medical Interventions
        - a. Endotracheal Tube
        - b. Tracheostomy Tube
        - c. Oxygen
        - d. Incentive Spirometer
        - e. Nebulizers
        - f. Mechanical Ventilation
        - g. Suctioning
      - 4. Surgical Interventions
        - a. Tracheostomy
        - b. Chest Tube Placement
        - c. Thoracotomy
- II. Cardiopulmonary Pathology
  - A. Cardiac Pathology
    - 1. Hypertension
    - 2. Coronary Artery Disease
    - 3. Angina Pectoris
    - 4. Myocardial Infarction
    - 5. Congestive Heart Failure
    - 6. Arrhythmia
    - 7. Pulmonary Embolism
  - B. Pulmonary Pathology
    - 1. Obstructive Pulmonary Disease
      - a. Chronic Bronchitis
      - b. Emphysema
      - c. Asthma
      - d. Bronchiectasis
      - e. Cystic Fibrosis
    - 2. Restrictive Lung Disease
      - a. Post-Thoracotomy
      - b. Pneumonia
      - c. Atelectasis
    - 3. Cardiopulmonary Pharmacology
      - a. Cardiac Meds

## b. Pulmonary Meds

### III. Cardiopulmonary Assessment and Treatment

#### A. Assessment

1. Lab tests
2. Exercise Testing
3. Pulmonary Function Tests
4. Observation
5. Auscultation
6. Palpation
7. Vital Signs
8. Rate of Perceived Exertion
9. Telemetry
10. Pulse Oximetry

#### B. Treatment

1. Exercise Prescription
  - a. Type
  - b. Intensity
  - c. Duration
  - d. Mode
2. Cardiac Rehab Phases
  - a. Phase I
  - b. Phase II
  - c. Phase III
3. Airway Clearance Techniques
  - a. Breathing Exercise
  - b. Chest Mobilization
  - c. Coughing
  - d. Postural Drainage
4. Energy Conservation Techniques

### IV. Diabetes and Peripheral Vascular Disease

#### A. Diabetes

1. Epidemiology
2. Types
  - a. Type I
  - b. Type II
3. Physiology
4. Clinical Manifestations
5. Rehabilitation Implications
  - a. Impact on Exercise
  - b. Peripheral Vascular Disease
6. Prevention

#### B. Peripheral Vascular Disease

1. Acute PVD
  - a. Venous Thrombosis
  - b. Arterial Occlusion
2. Chronic PVD
  - a. Chronic Venous Insufficiency

- b. Buerger's Disease
- c. Arteriosclerosis

**V. Wound Healing**

- A. Phases of Wound Healing
  - 1. Acute Inflammatory
  - 2. Proliferative Repair
  - 3. Maturation/Remodeling
- B. Extent of Injury
  - 1. Superficial
  - 2. Partial Thickness
  - 3. Full Thickness
- C. Assessment of Wounds
  - 1. Observation
  - 2. Measurements
- D. Treatment of Wounds
  - 1. Goals
  - 2. Cleansing
  - 3. Debridement
    - a. Selective
    - b. Non-Selective
  - 4. Dressings
    - a. Types
    - b. Application and Removal
  - 5. Specific Wound Care
    - a. Venous Stasis Ulcers
    - b. Arterial Ulcers
    - c. Pressure Ulcers
      - 1. Stage I
      - 2. Stage II
      - 3. Stage III
      - 4. Stage IV
    - d. Neuropathic ulcers
  - 6. Alternative Treatments
    - a. High Volt Stimulation
    - b. Ultrasound
    - c. Other Modalities

**VI. Amputation/Prosthetics**

- A. Amputations
  - 1. Levels of Amputations (LE)
  - 2. Surgical Procedures
  - 3. Pre-prosthetic Management
    - a. Goals
    - b. Post-op Dressings
    - c. Assessment of Residual Limb
    - d. Compressive Wrap
    - e. Positioning
    - f. Functional Activity
    - g. Exercises

- B. Prosthetics
  - 1. Transtibial
    - a. Foot-Ankle Assembly
    - b. Shank
    - c. Socket
    - d. Suspension
  - 2. Transfemoral
    - a. Foot-Ankle Assembly
    - b. Shank
    - c. Knee- Unit
    - d. Socket
    - e. Suspension
  - 3. Interfaces
  - 4. Prosthetic Training
    - a. Donning and Doffing
    - b. Functional Activities
    - c. Gait Training
  
- VII. Edema
  - A. Physiology of Edema
    - 1. Lymphatic
    - 2. Venous
  - B. Assessment of Edema
    - 1. Girth
    - 2. Volumetric
    - 3. Photography
  - C. Physical Therapy Treatment
    - 1. Elevation
    - 2. Thermal Physical Agents
    - 3. Therapeutic Massage
    - 4. Exercise
    - 5. Compression Dressings
    - 6. Intermittent Compression
  
- VIII. Burns
  - A. Classifications
    - 1. Superficial
    - 2. Superficial Partial Thickness
    - 3. Deep Partial Thickness
    - 4. Full Thickness
    - 5. Subdermal
  - B. Rule of Nines
  - C. Secondary Complications
  - D. Skin Grafting
  - E. Physical Therapy Treatment
    - 1. Goals
    - 2. Positioning and Splinting
    - 3. Exercises
    - 4. Functional Activities
    - 5. Massage
    - 6. Pressure Garments



Q. LABORATORY OUTLINE:

- I. Cardiopulmonary System
  - A. Assessment Techniques
    - 1. Vital Signs
    - 2. Pulse Oximetry
    - 3. Signs of Exertion
    - 4. Exercise Testing
    - 5. Body Composition
    - 6. Cardiovascular Endurance Tests
  - B. Airway Clearance Techniques
    - 1. Diaphragmatic Breathing
    - 2. Chest Mobilization Exercises
    - 3. Coughing
    - 4. Postural Drainage
      - a. Percussion
      - b. Vibration
      - c. Positions
  - C. Cardiopulmonary Situations/ Case Studies
  
- II. Integumentary System
  - A. Wound Healing
    - 1. Cleansing and Debridement
    - 2. Assessment of Wounds
    - 3. Wound Dressings
    - 4. HVPGS
    - 5. Case Studies
  - B. Amputations/Prosthetics
    - 1. Bandaging of Residual Limb
    - 2. Positioning
    - 3. Exercises
      - a. Stretching
      - b. Isometrics
      - c. Isotonics
    - 4. Donning and Doffing
    - 5. Prosthetic Gait Training
      - a. Balance Training
      - b. Gait Training Protocol
    - 6. Functional Activities
  - C. Edema/Burns
    - 1. Pressure Garments
    - 2. Intermittent Compression
    - 3. Positioning/Splinting