PLNU forward

Department of Physician Assistant Education

Master of Science in Medicine

3 units

MSM 6104 FUNDAMENTALS OF PULMONOLOGY

SPRING 2026

Meeting days: TBD	**Instructor title and name:** Sarah Mayer PA-C Dr. Kenneth Serio, MD
Meeting times: TBD	**Phone:**
Meeting location: 154 and Skills lab	**Email:** kserio@pointloma.edu
Final Exam and OSCE: 5/1/26 8:00am-5:00pm	**Office location and hours:**

PLNU Mission

To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

COURSE DESCRIPTION

This course covers the epidemiology, etiology, risk factors, pathogenesis, pathophysiology, complications, and differential diagnoses of commonly encountered pulmonary diseases and disorders through symptoms-based and systems-based approaches. Management of patients with these diseases and disorders across the life span from initial presentation through follow-up for acute, chronic, and emergent cases will be covered, as will referral when necessary, preventive medicine, and patient education.

COURSE GOALS

The goal of this course is to provide the appropriate basic science background essential to the understanding and diagnosis of disease patterns related to the respiratory system and to provide the student with the skills and knowledge necessary for the diagnosis and management of common pulmonary disorders.

PROGRAM LEARNING OUTCOMES

The content in this course will contribute to the student's proficiency in this/these area(s):

1. Gather a history and perform a physical examination. (MK, IC, PC, PR)
2. Prioritize a differential diagnosis following a clinical encounter. (MK, PC, PB, PR, SB)
3. Recommend and interpret common diagnostic and screening tests. (MK, IC, PC, PR, PB, SB)
4. Enter and discuss orders and prescriptions. (MK, IC, PC, PR, PB, SB)
5. Document a clinical encounter in the patient record. (MK, IC, PC, PR)
6. Provide an oral presentation of a clinical encounter. (MK, IC, PC, PB, PR)
7. Form clinical questions and retrieve evidence to advance patient care. (MK, PC, PR, PB, SB)
8. Give or receive a patient handover to transition care responsibility. (MK, PC, PR, IC, PB)
9. Collaborate as a member of an inter-professional team. MK, IC, PC, PR, PB, SB
10. Recognize a patient requiring urgent or emergent care and initiate evaluation and management. (MK, IC, PC, PR, PB, SB)
11. Obtain informed consent for tests and/or procedures. MK, IC, PC, PR, PB
12. Perform general procedures of a physician assistant. MK, IC, PC, PR, PB, SB

Initials indicate PA core competency required to meet the PLO/CLO.
PA Core Competencies:

MK = Medical Knowledge	IC = Interpersonal Skills & Communication	PC = Patient Care
PR = Professionalism	PB = Practice-based Learning	SB = Systems-based Practice

COURSE LEARNING OUTCOMES

Successful completion of this course requires demonstration of the skills and knowledge outlined here at, minimally, the ADVANCED BEGINNER level:

1. Obtain a history and perform a focused physical examination relevant to symptoms found within this organ system. (PC2; MK1; IC1; IC7; PR1; PR3; PR5)
2. Prioritize a differential diagnosis based on the history and physical findings in a patient with a pulmonary complaint. (PC2, PC4, MK2, MK3, MK4, PB1, IC2, PR8)
3. Recommend common diagnostic and screening tests, pharmacotherapeutics, and management based on their applicability to the differential diagnosis. (PC4, PC5, PC7, PC9, MK1, MK4, PB9, SB3)
4. Document a clinical encounter in the patient record. (PC4, PC6, IC1, IC2, IC5, PR4, SB1)
5. Provide an oral presentation of a clinical encounter including justification of the proposed management plan. (PC2; PC6; IC1; IC2; PB1; PR1; PR3)
6. Form clinical questions and retrieve evidence to advance patient care. (PC5, PC7, MK3, MK4, PB1, PB3, PB6, PB7, PB8, PB9)
7. Recognize a patient requiring urgent or emergent care for a pulmonary condition or the patient in whom the manifestation of systemic disease is pulmonary and initiate evaluation and management. (PC1, PC2, PC3, PC4, PC5, PC6, IC6, PR1, PR5)

INSTRUCTIONAL OBJECTIVES

Upon completion of the **ANATOMY AND PHYSIOLOGY** section of the course, the student will be able to:

1. Discuss factors that affect diffusive transport of a gas between alveolar gas and pulmonary capillary blood. Comprehension, B2.02a, B2.02b
2. Discuss the pathway, location and gas exchange that occurs with internal and external respiration. Comprehension, B2.02a, B2.02b
3. Describe pulmonary gas exchanges and circulation. Comprehension, B2.02a, B2.02b
4. Explain ventilation perfusion and gas exchange. Comprehension, B2.02a, B2.02b
5. Describe how airway resistance alters dynamic lung compliance. Comprehension, B2.02b
6. Define surface tension and describe how it applies to lung mechanics, including the effects of alveolar size and the role of surfactants. Application, B2.02a, B2.02b
7. Calculate total lung capacity, functional residual capacity, forced expiratory volumes, and residual volume. Application, B2.02b
8. Identify normal airway, alveolar, arterial and mixed venous PO_2 and PCO_2 values. Analysis, B2.02b
9. Identify normal arterial and mixed venous values for O_2 saturation, HCO_3- and pH. Analysis, B2.02b

Upon completion of the **PATHOPHYSIOLOGY** section of the course, the student will be able to:

10. Describe the effect of aging on lung volumes, lung and chest wall compliance, blood gasses, and respiratory control. Comprehension, B2.02c
11. Explain the development of pulmonary edema by: Comprehension, B2.02c
    a. increased hydrostatic pressure,
    b. increased permeability,
    c. impaired lymphatic outflow or increased central venous pressure, and
    d. hemodilution (e.g., with saline volume resuscitation).

12. Describe the mechanisms responsible for the changes in lung capacities that occur in patients with emphysema and pulmonary fibrosis. Comprehension, B2.02c

13. Define respiratory acidosis and alkalosis and provide clinical examples for each. Application, B2.02c

14. Compare and contrast the pathophysiology of obstructive and restrictive pulmonary diseases. Analysis, B2.02c

15. Describe the symptoms of narcolepsy, sleep apnea, disorders of initiating and maintaining sleep, and REM sleep behavior disorder. Comprehension, B2.02c

Upon completion of the **PHYSICAL DIAGNOSIS** section of the course, the student will be able to:

16. Generate an appropriate and comprehensive pulmonary medical history from patients presenting with signs and symptoms suggestive of pulmonary disease. Application, B2.07a

17. Perform a focused physical examination on a patient with suspected pulmonary disease. Application, B2.07b

18. Differentiate between normal and adventitious lung sounds including changes in transmission of sounds (e.g. bronchophony, egophony, etc) and identify the most likely etiologies. Analysis, B2.07c

19. Outline the elements of an arterial blood gas and predict typical abnormalities seen with various pulmonary diseases. Application, B2.07d

20. Match commonly employed diagnostic tests used in the evaluation of pulmonary disease to their utility. Comprehension, B2.07d

Upon completion of the **CLINICAL MEDICINE** section of the course, the student will: B2.03

21. Given a patient across all age groups, with any of the following signs or symptoms: interview and elicit a comprehensive, relevant medical history, B2.07a perform a complete and focused physical examination and identify the physical findings, B2.07b generate a complete list of differential diagnoses prioritizing them appropriately, B2.07c recommend an appropriate work-up, order and interpret diagnostic studies, B2.07d propose patient management including acute and chronic care plans, B2.07e provide patient education and referral. B2.07f, Evaluate

- **a. Chronic cough (> 8 weeks)**
  - i. Normal Chest x-ray
    1. Normal spirometry
       - a. Rhinosinusitis
       - b. Upper airway cough syndrome
       - c. Asthma
       - d. Post-infectious
       - e. Smoker's cough
       - f. Non-asthmatic eosinophilic bronchitis
       - g. Aspiration
       - h. ACE inhibitor
       - i. Reflux-associated cough
       - j. Psychogenic cough
       - k. Vocal cord dysfunction
    2. Obstructive Disease (FEV1/FVC < LLN)
       - a. Asthma
       - b. Bronchiectasis
       - c. Chronic bronchitis
       - d. emphysema
       - e. COPD
       - f. Cystic fibrosis
  - ii. Abnormal Chest x-ray
    1. Chronic infection (TB, fungal)
    2. Cystic fibrosis
    3. Neoplasm
    4. CHF
    5. Interstitial disease
    6. Foreign body*
    7. Bronchiectasis
- **b. Cough with fever and dyspnea**
  - i. normal chest x-ray

1. acute bronchitis
2. laryngotracheitis

ii. abnormal chest x-ray

1. infectious
    a. Viral pneumonia
    b. Bacterial pneumonia
    c. Tuberculosis
    d. Fungal pneumonia
    e. HIV related pneumonia
    f. Septic emboli
2. Non-infectious
    a. Pulmonary embolism*
    b. Cryptogenic organizing pneumonia
    c. Pulmonary vasculitis
    d. Neoplasm
        1. Carcinoid tumors
        2. Lung cancer
        3. Pulmonary nodules
            - Sarcoidosis
            - Pneumoconiosis

c. Dyspnea

i. acute (minutes to hours)

1. Cardiovascular
    a. Myocardial infarction*
    b. Cardiac tamponade*
    c. CHF
2. Respiratory
    a. Pleural
        - Pneumothorax*
    b. Parenchymal
        - Pneumonia
    c. Vascular
        - Pulmonary embolism*
    d. Airway – upper
        - Asthma*
        - AECOPD
    e. Airway lower
        - Aspiration
        - Anaphylaxis*

ii. Chronic dyspnea

1. Cardiac causes
    a. pericardial

- effusion
- cardiac tamponade*
- constriction

b. myocardial
- systolic dysfunction
- diastolic dysfunction
- restrictive cardiomyopathy

c. valvular
- stenosis
- regurgitation
- sub-valvular disease

d. coronary artery disease
- stable angina
- acute coronary syndrome*

e. Arrhythmia
- atrial fibrillation
- bradyarrhythmia
- tachyarrhythmia

2. Pulmonary causes

a. airway obstruction
- asthma
- COPD
- Neoplasm

b. abnormal parenchyma
- Alveolar
    - Pneumonia
    - Acute Respiratory Distress Syndrome
    - COP
    - Neoplasm
- Interstitium
    - CHF
- Vessels
    - PE
    - Pulmonary hypertension

c. Pleural abnormalities
- Pleural effusions
- Pleural thickening/masses

d. Chest wall abnormalities
- Neuromuscular weakness
- Kyphoscoliosis
- Abdominal distention

3. Other causes
- Anxiety
- Anemia

- Deconditioning
- Hyperthyroidism
- Metabolic acidosis

d. Chest discomfort

i. cardiovascular

1. ischemic
   - MI
   - Angina stable/unstable
2. non-ischemic
   - Pericarditis
   - Myocarditis
   - Aortic dissection

ii. Pulmonary

1. Pleural processes
   - <u>Pneumothorax (tension*)</u>
   - Pleuritis
   - Pleural effusion
   - Malignant mesothelioma
2. Processes that affect the pleura
   - Pneumonia
   - PE
   - Malignancy
   - Sarcoidosis
   - Acute chest syndrome

iii. Other

1. Gastrointestinal
   - GERD
   - Biliary disease
   - PUD
   - Pancreatitis
   - Esophageal spasm
   - Esophageal Perforation*
2. Musculoskeletal
   - Costochondritis
   - Muscular injury
   - Trauma
3. Neurologic/psychiatric
   - Anxiety/panic
   - HPS/post herpetic neuralgia
   - Somatoform disorder
   - Spinal radiculopathy

e. Excessive daytime sleepiness (differentiate from fatigue)

- i. insufficient sleep
  - 1. poor sleep hygiene
  - 2. insomnia
  - 2. behavioral sleep deprivation
- ii. Sleep disorders
  - 1. obstructive/central sleep apnea
  - 2. restless leg syndrome
  - 3. periodic limb movement disorder
  - 4. narcolepsy
- iii. medical/psychiatric disorders
  - 1. neurologic disorders (Parkinson's, MS)
  - 2. head trauma
  - 3. Depression
  - 4. Anxiety
- iv. other
  - 1. Medications
  - 2. Drug Abuse

f. **Wheezing (acute)**

- i. Asthma
- ii. Bronchiolitis

g. Emergent conditions*

- i. Foreign body*
- ii. Esophageal Perforation*
- iii. Pneumothorax (tension*)
- iv. Acute coronary syndrome*
- v. Cardiac tamponade*
- vi. Pulmonary embolism*
- vii. Anaphylaxis
- viii. Acute respiratory distress syndrome

22. Differentiate between normal and abnormal neurophysiology associated with REM and NREM sleep and movement disorders Application, B2.07c

23. Assess a given patient's general risk for pulmonary disease and provide patient education directed at early detection and prevention of long term pulmonary diseases; to include smoking cessation and other risk factors. Analysis, B2.07f

24. Discuss the relevance, and cost/benefit associated with common diagnostic studies in light of their contribution to a diagnosis. Comprehension, B2.07d

25. Discuss the indications, contraindications, complications, efficacy and effectiveness of proposed pharmacotherapeutic intervention. Comprehension, B2.02d
26. Identify the patient requiring emergent intervention for an acute pulmonary disorder. Evaluation, B2.08b
27. Design appropriate treatment plans for patients with chronic pulmonary disease. Synthesis, B2.07e, B2.08b
28. Discuss common pulmonary disorders presenting in children and in the elderly, their varying presentations and propose a management plan including consideration of co-morbidities and polypharmacy. Application, B2.02d, B2.07e, B2.08a
29. Working with the appropriate health care professional, develop an appropriate patient education plan as needed. Application, B2.07f
30. Working with the appropriate health care professional, recommend an appropriate patient referral plan as needed. Application, B2.07f
31. Working with the appropriate health care professional recommend a suitable rehabilitation plan as needed. Application, B2.08b
32. Working with the appropriate health care professional recommend a suitable prevention program as needed. Application, B2.08b
33. Working with the appropriate health care professional, recommend an appropriate palliative care plan for a patient facing end-of-life decisions. Application, B2.08e
34. Differentiate the evaluation and treatment approach in acute, chronic and emergent pulmonary disease. Analysis, B2.07e, B2.08b
35. Demonstrate skills in problem solving and medical decision-making through community learning group case discussions and activities. Application, B2.05
36. Demonstrate supportive counseling skills when delivering bad news to a patient. Application, B2.12c

SKILLS OBJECTIVES

Upon completion of this course, the student will demonstrate competency in:

1. Eliciting a history. Application, B2.07a
2. Performing a complete and focused pulmonary physical examination. Application, B2.07b
3. Auscultating and identifying abnormal and adventitious lung sounds. Application, B2.09

Students will also receive instruction in:

4. Accurately measuring oxygen saturation. Application, B2.09
5. Interpreting a CXR. Application, B2.09

Note: Superscripts identify the Bloom's Taxonomy level for each objective.

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

Note: Texts prefaced with double asterisks are provided in Access Medicine.

**Pathophysiology of Disease: An Introduction to Clinical Medicine 8E
By Gary D. Hammer, Stephen J. McPhee
McGraw-Hill/Lange
ISBN: 978-1260026504

Acid-Base, Fluids, and Electrolytes Made Ridiculously Simple 3rd Edition
by Richard A. Preston (Author). MedMaster Inc; 3rd edition (2018).
ISBN-10: 0940780984
ISBN-13: 978-1935660293

**Harrison's Principles of Internal Medicine 20/E (Vol.1 & Vol.2) 20th Edition by Dennis L. Kasper, Anthony S. Fauci, Stephen Hauser, Dan Longo, J. Larry Jameson, Joseph Loscalzo
ISBN-13: 978-1259644030
ISBN-10: 0071802150

**Current Medical Diagnosis and Treatment 2021, 60e
Author: Maxine A. Papadakis, Stephen J. Mcphee, Eds. & Michael Rabow, Assoc Ed
Publisher: McGraw-Hill
ISBN: 978-1260469868

**Tintinalli's Emergency Medicine: A Comprehensive Study Guide, Ninth Edition (Emergency Medicine (Tintinalli)) 9th Edition
by Judith Tintinalli (Author), J. Stapczynski (Author), O. John Ma (Author), David Cline (Author), Rita Cydulka (Author), Garth Meckler (Author)
ISBN-13: 978-1260019933
ISBN-10: 0071484809

Date	Topic/Instructor	Reading/Assignment
	Auscultation Lab	See Canvas for reading assignments
	Respiratory Physiology Pulmonary Pathophysiology	

	Pulmonary Auscultation Lab Practice Ultrasound lab	
	Pulmonary Auscultation Lab Practice	
	CXR Interpretation	
	Cough with Fever and Dyspnea	
	Emergent Conditions/Daytime Sleepiness	
	Asthma/COPD PFT's/Obstructive Lung Disease	
	Bronchiectasis/ILD	
	Acute Pulmonary Embolism, Pulmonary Hypertension	
	Skills Assessment I	
	Auscultation Assessment Group 1	

	Auscultation Assessment Group 2	
	Atelectasis, lung nodules, pleural effusions	
	CAP, Aspiration PNA, PNA mimics	
	Upper Airway Obstruction, Respiratory Failure, Non invasive PPV	
	Pulmonology, ARDS/Vent Management	
	Final Exam and PC OSCE	

LEARNING MODALITIES

Modalities include lectures, on-line pre-lecture activities, reading assignments, community learning activities, and clinical skills labs. The class schedule and assignments can be found in Canvas.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. Therefore, regular attendance and participation in each course are minimal requirements.

If the student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university withdrawal date or, after that date, receive an "F" grade.

Students who anticipate being absent for an entire week of a course should contact the instructor in advance for approval and make arrangements to complete the required coursework and/or alternative assignments assigned at the discretion of the instructor. Acceptance of late work is at the discretion of the instructor and does not waive attendance requirements.

Refer to Academic Policies for additional detail.

1. You MUST attend:
   - PE and clinical skills labs appropriately dressed and with all necessary equipment
   - examinations on the date and time for which they are schedule
   - community learning group

2. We expect
   - active participation in all class activities.
   - completion of all class preparatory assignments prior to commencement of class.
   - respect for the class, peers and faculty.
   - on-time arrival for all classes, laboratories, learning groups or any scheduled activities. Routine tardiness demonstrates a lack of professionalism and will not be tolerated

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. No partial credit will be given for late assignments. Incompletes will only be assigned under extremely unusual circumstances. Late assignments receiving no credit must still be submitted. Students failing an examination or practicum must complete the designated remediation (See REMEDIATION below) within the assigned time.

FINAL EXAMINATION POLICY

Successful completion of this class requires taking the final examinations (written and practical) **on their respective scheduled days**. No requests for early examinations or alternative days will be approved.

ASSESSMENT AND GRADING

Student course grades are calculated using all assessment tools utilized during the course. These include quizzes, written examinations, written assignments, practicums, and evaluation of skills.

Learning community groups will be utilized to provide case-based instruction. A clinical case will be presented to each group by the group mentor. Students are expected to utilize knowledge acquired from prior readings and lectures, as well as self/group directed learning to work up the case, develop a

working diagnosis, a differential diagnosis and a therapeutic regimen which will include a follow-up plan and patient education. Effective interpersonal communication, clinical reasoning and problem solving abilities, professional behavior and teamwork are paramount to success and development as clinicians. Cases will be issued no more frequently than every other week. There will be 2 cases in this module. Students will receive a collective grade for this exercise.

Learning community group performance expectations include; demonstrating effective interpersonal communication, clinical reasoning and problem solving abilities, professional behavior and teamwork skills. Application, B2.05, B4.03b, B4.03c, B4.03e

ACTIVITY	% OF GRADE
Learning Community	5%
Case Study H&P	5%
Written Examinations	40%
Skills OSCE/Auscultation Assessment	15%
Patient-centered OSCE	25%
Quizzes/Assignments (Healer, Aquifer, Lecturio, Etc)	10%

Grading will be in keeping with Point Loma Nazarene University policy for graduate programs and grading will be as follows:

A=93-100	C=73-76
A-=92-90	C-=70-72
B+=87-89	D+=67-69
B=83-86	D=63-66
B-=80-82	D-=60-62
C+=77-79	F=0-59

REMEDIATION

Remediation is the process by which both the student and the program are assured that performance indicating a deficiency in knowledge or skills is subsequently demonstrated to be satisfactory. This may include a re-test over missed material, a skills demonstration or a review of missed material with completion of corrected answers. It is important to note that this is content remediation, not grade remediation and no grade will be changed based on these activities.

Within 48 hours of the posting of a grade of <70%, the student MUST contact the course director to discuss the student's performance and create a remediation plan. Unless otherwise directed by the course director, remediation activities must be completed within 5 days.

PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU Recording Notification

In order to enhance the learning experience, please be advised that this course may be recorded by the professor for educational purposes, and access to these recordings will be limited to enrolled students and authorized personnel.

Note that all recordings are subject to copyright protection. Any unauthorized distribution or publication of these recordings without written approval from the University (refer to the Dean) is strictly prohibited.

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See the Academic Honesty Policy in the Graduate and Professional Studies Catalog for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester

about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

This syllabus is subject to change. Students are encouraged to check course messages and emails in order to remain current.

ARC-PA standards (5th edition) addressed in this course: B2.02(a)(b)(c)(d), B2.03, B2.05,B2.07, B2.08, B2.09, B2.12, B4.03b, B4.03c, B4.03e