

Cardiopulmonary Testing (RSPT 1335)



Credit: 3 semester credit hours (3 hours lecture, 1 hours lab)

Prerequisite: RSPT 1329, RSPT 1207, RSPT 2210, RSPT 1113, RSPT 1325

Co-requisite: RSPT 1331, RSPT 1360

Course Description

A study of pulmonary functions and cardiac dysrhythmias interpretation

Required Textbook and Materials

1. Cardiopulmonary Anatomy and Physiology- DesJarden (ISBN # 978-1-4180-4278-3)
2. Respiratory Care Principles and Practice (ISBN # 978-1-284-050000-4)
3. Mosby's Respiratory Care Equipment 9th Edition (ISBN # 978-0-323-09621-7)
4. EKG Plain and Simple – 3rd edition- Ellis (ISBN # 978-0-13-237729-4)
5. PFT Notes- Gary White (ISBN#978-0-8036-2249-4)
6. DataArc assess
7. #2 Pencils
8. Package of # 882 scantrons
9. Calculator
10. Ruler
11. Web based reading information: www.AARC.org
Clinical practice guidelines:
Body Plethysmography 2001 – revision and update
Capnography/ Capnometry during mechanical ventilation 2003 revision and update
Exercise for evaluation of hypoxemia and desaturation 2001 revision and update
Methacholine Challenge Testing 2001 revision and update
Spirometry 1996 revision and update
Single breath carbon monoxide diffusion capacity 1999 revision and update
Pulmonary function testing- ATS/ERS standardization
ATS statement guidelines for the Six minute walk test

Course Objectives

Upon completion of the course the student will be able to:

1. Explain/identify both normal and abnormal heart conduction.
2. Explain/ identify both normal and abnormal pulmonary function values.
3. Determine indications, describe methods, standards and purpose of monitoring cardiac function and pulmonary function within patient scenarios.
4. Interpret both cardiac rhythm strips and pulmonary function studies.

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5. Determine appropriate response to different patient scenarios involving pulmonary functions studies and cardiac monitoring.

Course Outline

- A. Electrical conduction
/Electrophysiology
 1. The generation of the electrical current in the heart
 2. Electrical current through the four chambers of the heart
 3. Detecting and recording the EKG waves
 4. Time and voltage
- B. Hypertrophy and Enlargement
 1. Atrial enlargement/hypertrophy
 2. Ventricular enlargement/hypertrophy
- C. Conduction Blocks
 1. What is a conduction block
 2. Life-threatening blocks
 3. AV blocks- first degree, second degree (mobitz I and mobitz II), third degree
 4. Bundle Branch Blocks
 5. EKG pacemaker spikes
- D. Disorders associated with abnormal EKG's
 1. MI
 2. Electrolyte imbalances
 3. Drug toxicity
- E. Cardiac procedures
 1. Angioplasty
 2. IABP
 3. LVAD
 4. RVAD
- F. Lung volumes
 1. Equipment
 2. Procedure
 3. Techniques used to determine.
- G. Spirometry and Pulmonary Mechanics
 1. Equipment
 2. Procedure
 3. Review data in patient records (PFT results)
 4. Flow- Volume and Volume-Time
 5. Acceptable Values
- H. Gas Distribution Test
 1. Single-breath nitrogen elimination
 2. Phases of the single breath nitrogen elimination
 3. Procedure
- I. Diffusion
 1. Gases used
 2. Procedure
 3. Equipment
- J. Methacholine and Histamine Bronchial Provocations Testing
 1. Indicators
 2. Inhaled substances
 3. Positive findings
- K. Capnography
 1. Indications
 2. Requirements for CO₂ removal
 3. Situations hindering Co₂ removal
 4. Graphic analysis
 5. Assessing patient response to procedures based off the end-tidal Co₂ results
 6. Calculating V_d/V_T
- L. Indirect Calorimetry
 1. Indications
 2. Contraindicaitons
 3. Hazards and Complications
 4. Assessment of Need
 5. Assessment of Test Quality
 6. Monitoring during indirect calorimetry

- M. Stress testing
1. Indications
2. Contraindications

3. Hazards
4. Monitoring
5. Positive responses

Grade Scale

93 – 100	A
85 – 92	B
77 – 84	C
68 – 76	D
0 – 67	F

Course Evaluation

Final grades will be calculated according to the following criteria:

4 – 6 EXAMS = 95%

Daily pop quizzes will be given at the start of class. If you are late for class this pop quiz will not be made up. The average of the daily pop quiz grades will count as 1 exam. You may drop 2 daily pop quiz grades prior to average.

Lab- 5%

Course Requirements

1. Competency in performing bedside mechanics/ spirometry on peers within the laboratory setting.
2. Competency in connecting leads for a 12 lead EKG on a mannequin in the laboratory setting.

Course Policies

1. No food or drink, or use of tobacco products in class
2. Beepers, telephones, headphones, and other electronic devices must be turned off while in class
3. On days of test, you will place personal items at the front of the classroom, No electronic devices may be used during an exam. If you have a electronic device during an exam you will receive a 0 for that exam.
4. No children allowed in the classroom
5. No late assignments will be accepted
6. Pop Quiz will not be able to be made up.
7. Comply with LIT policies and policies in the Respiratory Care Handbook
8. Comply with course and/or instructor policies, distributed on the first class day
9. Labs are graded on attendance and participation. If you miss one lab your lab grade will be 90. If you miss 2 labs your lab grade will be 80, If you miss 3 labs your lab grade will be 70, If you miss 4 labs your lab grade will be 60. Early departure or tardiness will result in an absence. Failure to obtain competency in the required procedures will result in an “F” for the course.

Technical Requirements (for courses using Blackboard)

The latest technical requirements, including hardware, compatible browsers, operating systems, software, Java, etc. can be found online at:

[https://help.blackboard.com/en-](https://help.blackboard.com/en-us/Learn/9.1)

[us/Learn/9.1](https://help.blackboard.com/en-us/Learn/9.1) 2014 04/Student/015 Browser Support/015 Browser Support Policy A

functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of the online technology and resources.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building. You may also visit the online resource at <http://www.lit.edu/depts/stuserv/special/defaults.aspx>

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document

Course Schedule

Week	Topic	Required reading
1	Spirometry	DesJardin Chapter 12 Principles and Practice Ch 8 page 145-156 PFT notes page 15-49
2	Spirometry	DesJardin Chapter 12 Principles and Practice Ch 8 page 145-156 PFT notes page 15-49
3	Lung volume	DesJardin Chapter 12 Principles and Practice Ch8 page 156-164 PFT notes page 50-74
4	Lung volume/ diffusion	DesJardin Chapter 12 Principles and Practice Ch 8 page 156-164 PFT notes page 50-74
5	Exam #1- / Methacholine-BPT	DesJardin Chapter 12 Principles and Practice Ch 8 page 164-165 PFT notes page 94-131
6	Metabolic Studies/Indirect calorimetry/ End tidal Co2	DesJardin Chapter 18 Principles and Practice Ch 8 page 165-169 Principles and Practice Ch 2 Page 32- 35 PFT notes page 130-131.
7	Stress testing	DesJardin Chapter 18 Principles and Practice Ch 12
8	Review	
9	Exam #2 Basics of EKG	DesJardin Chapter 12, 13 EKG- Plain and simple Chapter 1-6 Principles and Practice Ch 6
10	Atrial Rhythms	EKG- Plain and simple Chapter 7 Principles and Practice Ch 6
11	Junctional rhythms	DesJardin Chapter 13 EKG- Plain and simple Chapter 9 Principles and Practice Ch 6
12	Ventricular rhythms	DesJardin Chapter 14 EKG- Plain and simple Chapter 10 Principles and Practice Ch 6
13	EKG review/ Exam #3	DesJardin Chapter 14 EKG- Plain and simple Chapter 13 Principles and Practice Ch 6
14	Blocks	DesJardin Chapter 14 EKG- Plain and simple Chapter 11 Principles and Practice Ch 6
15	Cardiac disorders/ balloon pups, angioplasty	DesJardin Chapter 12 EKG- Plain and simple Chapter 1 Principles and Practice Ch 6

Week	Topic	Required reading
16	Exam #4-	DesJardin Chapter 4 Final

Lab schedule:

Week	Topic	Required reading
1		
1	Performing bedside spirometry/ Pulmonary mechanics	
2	Height and weight nomogram (getting predicted values)	DesJardin Chapter 14
3	Water seal spirometer, pneumotach	DesJardin Chapter 14
4	Calculations of Tangents, Hand calculations of FVC, FEV1, FEF 25-75%	DesJardin Chapter 13
5	Interpretation of PFT	DesJardin Chapter 4
6	End- tidal Co2 monitoring	
7	Counting rates, regular vs irregular rhythm, measuring voltage	DesJardin Chapter 12, 13 EKG- Plain and simple Chapter 1-6
8	Counting rates, regular vs irregular rhythm, measuring voltage	EKG- Plain and simple Chapter 1-6
9	12 lead viewing, V1- V6, AVR, AVF, AVL, I, II, III	EKG- Plain and simple Chapter 7
10	12 lead viewing, V1- V6, AVR, AVF, AVL, I, II, III	Egan Chapter 17, DesJardin Chapter 13
11	Interpretation of atrial disturbances	EKG- Plain and simple Chapter 9
12	Interpretation of atrial disturbances	DesJardin Chapter 14, EKG Ch9
13	Interpretation of ventricular disturbances	DesJardin Chapter 14
14	Interpretation of ventricular disturbances	DesJardin Chapter 14
15	Interpretation of WPW, LGL, Hypertrophy and enlargement	EKG- Plain and simple Chapter 10
16	Putting it all together	

Contact Information:

Instructor: Mrs. Cynthia McKinley

Office: 241 MPC

Telephone: 409-880-8851

E-mail: cindy.mckinley@lit.edu

Office hours: Posted outside office. Additional times are available with appointment.