Cardiopulmonary Testing RSPT 2325

LAMAR INSTITUTE OF TECHNOLOGY

INSTRUCTOR CONTACT INFORMATION

Instructor:	Stacee Rashall
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Office Location:	Gateway 109
Office Hours:	Posted on door

CREDIT

3 Semester Credit Hours (3 hours lecture, 1 hours lab)

MODE OF INSTRUCTION

Face to Face

PREREQUISITE/CO-REQUISITE:

RSPT 1329, RSPT 1207, RSPT 2210, RSPT 1113, RSPT 1325/RSPT 1331, RSPT 1360

COURSE DESCRIPTION

A study of pulmonary functions and cardiac dysrhythmias interpretation

COURSE OBJECTIVES

Upon completion of this course, the student will be able to

- Explain/identify both normal and abnormal heart conduction.
- Explain/ identify both normal and abnormal pulmonary function values.
- Determine indications, describe methods, standards and purpose of monitoring cardiac function and pulmonary function within patient scenarios.
- Interpret both cardiac rhythm strips and pulmonary function studies.
- Determine appropriate response to different patient scenarios involving pulmonary functions studies and cardiac monitoring.

REQUIRED TEXTBOOK AND MATERIALS

- Egans Fundamentals of Respiratory Care 12th Edition (ISBN # 978-0-323-51112-4)

1. Egans Fundamentals of Respiratory Care Workbook 12th Edition (ISBN 978-0-32355366-7)
2. Mosby's Respiratory Care Equipment 10th Edition (ISBN # 978-0-323-55313-1)
3. Trajecsys access
4. Cardiopulmonary Anatomy and Physiology- DesJarden (ISBN # 978-1-4180-4278-3)

5. EKG Plain and Simple – 4th edition- Ellis (ISBN # 978-0-13-237729-4)
6. PFT Notes- Gary White- not in publication (copy will be provided)
7. A package of #882 Scantrons and #2 pencils
8. Stethoscope
9. #2 Pencils
10. Package of # 882 scantrons
11. Calculator
12. Ruler
13. Watch (with a second hand and waterproof)
14. Kettering Modules : TMC
    Pulmonary diagnostic testing A,B,C
    Special procedures-A
15. 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

ATTENDANCE POLICY

It is the student's responsibility to familiarize his or herself with the LIT Student Handbook and the Respiratory Care program student handbook.

Violation of the policies listed in the LIT Student Handbook and/or the Respiratory Care program student handbook will result in appropriate action being taken.

Attendance: Attendance is expected. Students are allowed 2 absences per semester, with or without a Dr.'s excuse. Each absence in excess of the 2 allotted absences will result in a 10% reduction, per absence, in the student's final class grade. Example: 3 absences = 10% reduction in final class grade, 4 absences = 20% reduction in final class grade, etc. Deductions as a result of excessive absences, will be applied to the student's final class grade at the end of the semester.

Your attendance is the biggest predictor or your success. If you do not attend class, you are missing very valuable information. Attendance will be recorded both in the classroom and in the lab. Absences in lab will result in a grade of 0 for that lab day. Tests will include both textbook material and material presented in class.

If absences seriously interfere with performance, the instructor may recommend, to the Department Chair, that the student be dropped form the course.

Absences resulting from extenuating circumstances will be evaluated by the program Director and/or Director of Clinical Education on a case by case basis. Proper documentation will be required to demonstrate the nature of the extenuating circumstance.

Examples of extenuating circumstances, and documentation, include:
-Hospitalization of an immediate family member (Hospital/Physician documentation must be provided)
-Death of an immediate family member (Memorial Pamphlet must be provided)

Tardiness: Punctuality is expected. 3 tardies in a semester will be considered as a 1 day absence.

You must notify the instructor via phone call, prior to missing an exam. Failure to notify instructor of an absence prior to the start of the exam will result a grade of 0 will be assigned for the missed exam. There will be no makeup exams or lab assignments if you fail to notify the instructor prior to a missed exam.

Make-Up Exams: Make up exams will be taken the first class day that the student returns following an absence. Make-up exams will be administered immediately at the beginning of the class on the day of return.

Homework Assignments: Homework assignments will be due immediately at the start of class. Late work (work turned in after the start of class) will not be accepted. If you are absent on the day a homework assignment is due, it is your responsibility to ensure that your work is emailed to the instructor prior to the start of class on the day of your absence.

Pop Quizzes: Pop Quizzes will be administered at the start of class. Any student who arrives tardy to class, after the Pop Quiz has been distributed, will receive a 0 grade for that pop quiz.

DROP POLICY

If you wish to drop a course, you are responsible for initiating and completing the drop process by the specified drop date as listed on the Academic Calendar. If you stop coming to class and fail to drop the course, you will earn an "F" in the course.

STUDENT EXPECTED TIME REQUIREMENT

For every hour in class (or unit of credit), students should expect to spend at least two to three hours per week studying and completing assignments. For a 3-credit-hour class, students should prepare to allocate approximately six to nine hours per week outside of class in a 16-week session OR approximately twelve to eighteen hours in an 8-week session. Online/Hybrid students should expect to spend at least as much time in this course as in the traditional, face-to-face class.

Course Calendar

Week	TOPIC LAB/LECTURE	READINGS (LECTURE)	READINGS (LAB)
Week 1	• Basics of EKG, electrical flow and muscle movement • Counting rates, regular vs irregular rhythm, measuring voltage	Eg DesJardin Chapter 12, 13 EKG- Plain and simple Chapter 1-6	EKG- Plain and simple Ch. 1-6 Egan's Ch.17 Egan's Ch.17 DesJardin Ch.14
Week 2	• Troubleshooting Hemodynamics/ Atrial Rhythms • 12 lead viewing, V1- V6, AVR, AVF, AVL, I, II, III	DesJardin Chapter 12 Egans Chapter 20	EKG- Plain and simple Ch. 7-9 DesJardin Ch. 14
Week 3	• Exam 1 • Junctional rhythms • Interpretation of atrial disturbances	DesJardin Chapter 12,13 Egans Chapter 20 PFT notes page 50-74	EKG- Plain and simple Ch. 9
Week 4	• Ventricular rhythms • Interpretation of atrial disturbances	DesJardin Chapter 14 EKG- Plain and simple Chapter 10 Egans Chapter 18	DesJardin Ch. 14, EKG Ch. 9
Week 5	• AV Blocks • Interpretation of ventricular disturbances • Exam 2	DesJardin Chapter 12 EKG- Plain and simple Chapter 1	EKG- Plain and simple Ch. 10
Week 6	• Cardiac disorders, balloon pumps, angioplasty • Interpretation of WPW, LGL, Hypertrophy and enlargement Ventricular assist devices, • Advanced concepts/cardioversion	Powerpoints VAD,	EKG ch.13
Week 7	• MI/Stemi/Preexcitation Syndromes • Identify Cardiac Arteries		
Week 8	• Reversible causes H's and T's • Counting rates, regular vs irregular rhythm, measuring voltage interpretations • Exam 3	DesJardin Chapter 14 EKG- Plain and simple Chapter 13 Egans Chapter 18	DesJardin Chapter 14

Week 9	• CPX testing • Stress testing/6-minute walk •	DesJardin Chapter 18 Egans Chapter 23 PFT notes page 125-128	DesJardin Chapter 18 Egans Chapter 23 PFT notes page 130-131
Week 10	• Indications for Spirometry • Lung volumes measurements	DesJardin Chapter 18 Egans Chapter 20 ATS powerpoint	DesJardin Ch. 3 Egans Ch.19 PFT notes 15-49
Week 11	• Indications for Spirometry • Lung volumes measurements •	Powerpoint PFT	DesJardin Ch. 3 Egans Ch.19 PFT notes 51-74
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Week 12	• PFT interpretations • AARC Clinical practice guidelines	Powerpoint PFT ATS guidelines	Egan's Ch. 19 PFT notes 15-49
	• Exam 4		
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Week 13	• Indirect Calorimetry	Powerpoint PFT	Egan's Ch. 21 DesJardin Ch. 3
Week 14	• Cardiopulmonary Exercise testing	Powerpoint PFT	
Week 15	• Methacholine challenge/dlco/SBCO2 • Review Exam 5		Egan's Ch.19-2 PFT notes 75-8
Week 16	• Finals week		

COURSE EVALUATION

Final grades will be calculated according to the following criteria:

- 4-6 Exams = 90%
- Test dates may/ are subject to change to facilitate better student learning
- Homework/Modules/Quiz = 10%

GRADING SCALE

90 – 100	**A**
80-89	**B**
77 –79	**C**
70 – 76	**D**
0 – 69	**F**

LIT does not use +/- grading scales

ACADEMIC DISHONESTY

Students found to be committing academic dishonesty (cheating, plagiarism, or collusion) may receive disciplinary action. Students need to familiarize themselves with the institution's

Academic Dishonesty Policy available in the Student Catalog & Handbook at http://catalog.lit.edu/content.php?catoid=3&navoid=80#academic-dishonesty.

TECHNICAL REQUIREMENTS
The latest technical requirements, including hardware, compatible browsers, operating systems, etc. can be online at https://lit.edu/online-learning/online-learning-minimum-computer-requirements. A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of online technology and resources.

DISABILITIES STATEMENT
The Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. LIT provides reasonable accommodations as defined in the Rehabilitation Act of 1973, Section 504 and the Americans with Disabilities Act of 1990, to students with a diagnosed disability. The Special Populations Office is located in the Eagles' Nest Room 129 and helps foster a supportive and inclusive educational environment by maintaining partnerships with faculty and staff, as well as promoting awareness among all members of the Lamar Institute of Technology community. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409)-951-5708 or email specialpopulations@lit.edu. You may also visit the online resource at Special Populations - Lamar Institute of Technology (lit.edu).

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. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document.

Artificial Intelligence Statement

Lamar Institute of Technology (LIT) recognizes the recent advances in Artificial Intelligence (AI), such as ChatGPT, have changed the landscape of many career disciplines and will impact many students in and out of the classroom. To prepare students for their selected careers, LIT desires to guide students in the ethical use of these technologies and incorporate AI into classroom instruction and assignments appropriately. Appropriate use of these technologies is at the discretion of the instructor. Students are reminded that all submitted work must be their own original work unless otherwise

specified. Students should contact their instructor with any questions as to the acceptable use of AI / ChatGPT in their courses.

STARFISH

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty members record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended actions. Starfish is used to help you be a successful student at LIT.

ADDITIONAL COURSE POLICIES/INFORMATION

- No food or drink, or use of tobacco products in class
- Ear buds, telephones, headphones, and other electronic devices must be turned off while in class
- 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.
- No children allowed in the classroom
- No late assignments will be accepted
- Pop quiz will not be able to be made up.
- Comply with LIT policies and policies in the Respiratory Care Handbook
- Comply with course and/or instructor policies, distributed on the first-class day

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. -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

L. Situations hindering Co2 removal

M. Graphic analysis

1. Assessing patient response to procedures based off the end-tidal Co2 results
2. Calculating Vd/VT

N. Indirect Calorimetry
1. Indications
2. Contraindications
3. Hazards and Complications
4. Assessment of Need
5. Assessment of Test Quality
6. Monitoring during indirect calorimetry

). Stress testing

1. Indications
2. Contraindications
3. Hazards
4. Monitoring
5. Positive responses