DSAE 2403 3A3/5A3

CARDIOVASCULAR CONCEPTS

CREDIT
4 SCH Semester Credit Hours (3 hours lecture, 2 hours lab)

MODE OF INSTRUCTION
Face to Face Instruction

PREREQUISITE/CO-REQUISITE:
Passed all previous sonography courses.

COURSE DESCRIPTION
Anatomy, physiology and pathophysiology of the cardiovascular system. Focuses on cardiovascular structural anatomy and relationships, electrical innervation, embryology and hemodynamics of the cardiovascular system. Includes pathophysiology, etiology, pathology, signs, symptoms, risk factors, and treatment of related disease.

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

- Identify the anatomical structures of the cardiovascular system.
- Describe blood flow and electrical conduction through the heart.
- Describe normal and pathological hemodynamics.
- List the major stages of fetal cardiovascular development.
- Describe the signs, symptoms, etiology, pathophysiology, risk factors, treatment methods, and evaluation methods for the most prevalent cardiovascular diseases.

INSTRUCTOR CONTACT INFORMATION

Instructor:	Melissa Mann	(Lecture/Lab)
	Mark Adams	(Lab)
Email:	mamann@lit.edu	
	maadams@lit.edu	
Office Phone:	Mrs. Mann 409-257-0057	
Office Location:	GATEWAY 111	
Office Hours:	Please see Starfish to schedule an appointment	

REQUIRED TEXTBOOK AND MATERIALS
Approved: MM/ 2025

1. **The Notebook 8.0 edition, by Susan King DeWitt, BS, RDCS, RCS**
   http://echocardiographer.tripod.com as well as the workbook that corresponds with this textbook.
2. Computer with internet access
3. Webcam for taking exams

Suggested Textbook and Materials

1. **Textbook of Clinical Echocardiography**
   By: Catherine Otto MD
   ISBN#978-1-4160-5559-4
2. **Sound Advice for the Ultrasound Lab: Echocardiographic Protocol**
   By: Tom Whelan RT(R), RVT, RDCS, FASE
   The Advanced Health Education Center

ATTENDANCE POLICY

Students are expected to be in class unless prior arrangements have been made Absences must be limited to serious illness and/or immediate family emergencies. **Three (3) lecture absences will result in a letter grade reduction. Two (2) lab absences will result in a 10 point grade reduction from the overall lab average. Excessive tardiness (more than 15 minutes/class or more than 2 consecutive classes)** will result in an absence being awarded. Also, leaving class early will result in an absence being awarded. In the event that LIT is forced to cancel classes due to inclement weather, DMS classes and clinical rotation will also be canceled. Notification of closures will be made through the LIT Emergency Notification System. Students out of the immediate broadcast area should contact the Program Director for information. **It is extremely important that students communicate with the faculty regarding absences by telephone and/or email at all times.**

- The terminology excused or unexcused absence does not apply to this class. All absences are equal. Therefore, no matter the circumstances involved in the student's absence it will be counted towards the total for the semester.
- The sign in sheet will be taken up 15 minutes after class starts. If you are more than 15 minutes late to class you will be counted absent. Also, if you leave the classroom for more than 15 minutes you will be counted absent.
- When absent, the student is required to contact the instructor and make them aware of the absence and to obtain any missed assignments and/or information for the missed class.

DROP POLICY

If you wish to drop a course, you are responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an "F" in the course.

LECTURE COURSE CALENDAR

WEEK	TOPIC	READINGS	ASSIGNMENTS (Due on this Date)
1 (10/21-10/23)	Go over Syllabus and Class Rules CARDIAC PHYSIOLOGY PP **UNIT I**	Blackboard Chapter I Pgs. 18-26 / Workbook Assignments via Blackboard	
2 (10/28-10/30)	10/29 - CARDIAC PHYSIOL. PP ***10/30- UNIT I TEST/*** BEGIN ECHO DOPPLER PP	Blackboard Chapter I Pgs. 18-26 / Workbook Unit I PP and Homework Assignments via Blackboard	**UNIT I TEST and HOMEWORK DUE**
3 (11/04-11/06)	ECHO DOPPLER PP **UNIT II**	Blackboard Chapter III Pgs. 41-53/ Chapter Iva Pgs. 61-105/ Workbook Assignments via Blackboard	
4 (11/11-11/13)	***11/11 - UNIT II TEST/*** BEGIN ECHO DOPPLER QUANTITATION PP 11/13 - ECHO DOPPLER QUANTITATION PP **UNIT III**	Blackboard Chapter III Pgs. 41-53/ Chapter IVa Pgs. 61-105/ Chapter IVb Pgs. 106-122 Workbook Assignments via Blackboard	**UNIT II TEST and HOMEWORK DUE**
*****	**BLACKBOARD JOURNAL ASSIGNMENT**		**DUE ONLINE November 16, 2025 BY MIDNIGHT**
5 (11/18-11/20)	ECHO DOPPLER QUANTITATION PP **UNIT III**	Blackboard Chapter III Pgs. 41-53/ Chapter IVa Pgs. 61-105/ Chapter IVb Pgs. 106-122 Workbook	

		Assignments via Blackboard	
6 (11/25-11/27)	***11/25 - UNIT III TEST/*** Embryology PP **Unit IV** **11/27 THANKAGIVING HOLIDAY NO CLASS**	Blackboard Chapter II Pgs. 31-40/ Workbook PP and Homework Assignments via Blackboard	**UNIT III TEST AND HOMEWORK DUE**
*****	**RESEARCH PROJECT PP**		**Electronic Copy of PP DUE 12/01/25 BY 8 PM HARD COPY IN REPORT FOLDER DUE BEGINNING OF CLASS 12/02/25**
7 (12/02-12/04)	***12/02*** **- RESEARCH PROJECT PP PRESENTATIONS** 12/04 - Embryology PP **Unit IV/** Review For Final		**FLASHCARD REVIEW ASSIGNEMENT DUE IN CLASS DECEMBER 04, 2025.** **UNIT IV TEST AND HOMEWORK DUE ONLINE BY 7PM ON DECEMBER 6, 2025 @8 PM.**
8 (12/09)	**2403 LECTURE FINAL EXAM**		**FINAL EXAM**

- This schedule is subject to change at the discretion of the instructor.

LAB COURSE CALENDAR

DATE	LAB ACTIVITY	INFO NEEDED	ASSIGNMENTS (Due on this Date)
10/21	Review 2D/M-Mode	Protocol / Tips/ Instructions found on Blackboard	
10/23	**2D/M-MODE MEASUREMENTS TEST**	*Blackboard/ Coresound*	**TEST I October 23, 2025 2D/M-MODE MEASUREMENTS**
10/28	PLAX/PSAX CF Doppler	Protocol / Tips/ Instructions found on Blackboard	
10/30	Apical/SUB CF Doppler	Protocol / Tips/ Instructions found on Blackboard	
11/04	Review CF Doppler	Protocol / Tips/ Instructions found on Blackboard	
11/06	**CF DOPPLER TEST**	*Blackboard/ Coresound*	**TEST II November 6,2025 CF Doppler**
11/11	MV/TV Doppler	Protocol / Tips/ Instructions found on Blackboard	
11/13	MV/TV Doppler	Protocol / Tips/ Instructions found on Blackboard	
11/18	MV/TV Doppler	Protocol / Tips/ Instructions found on Blackboard	**TEST III - BUTTON PROTOCOL MV/TV DOPPLER TEST November 18,2025**
11/20	**SCAN AND FEAST TBA**	Protocol / Tips/ Instructions found on Blackboard	
11/25	MV/TV Doppler	Protocol / Tips/ Instructions found on Blackboard	
11/27	**HOLIDAY- THANKSGIVING**	Protocol / Tips/ Instructions found on Blackboard	
12/02	**2403 SCAN FINALS MV/TV Doppler DURING THIS LAB**	*Blackboard/ Coresound*	**2403 SCAN FINALS December 02,2025 MV/TV DOPPLER**
12/04	**2403 SCAN FINALS**	*Blackboard/ Coresound*	**2403 SCAN FINALS**

	MV/TV Doppler DURING THIS LAB		**December 04,2025 MV/TV DOPPLER**

- This schedule is subject to change at the discretion of the instructor.

COURSE EVALUATION
There are two components to this course, lecture and lab. They come together for a combined overall grade.

Final Semester grades will be calculated according to the following criteria:

1.	**Unit tests**	**39%**
2.	**Final Exam**	**20%**
3.	**Research Project**	**10%**
4.	**Class Participation/Homework/ Journal Assignment**	**5%**
5.	**Lab**	**26%**

- **a. Lab Tests** **(6.50% of the 26%)**
- **b. Participation** **(6.50% of the 26%)**
- **c. Lab Final** **(13% of the 26%)**

Course Requirements

1. Unit tests
2. Reading assignments
3. Homework
4. Research Project
5. Journal Assignment
6. Lab Tests
7. Lab Participation
8. Scan Final
9. Lecture Final Exam

GRADE SCALE

- 93-100 A
- 85-92 B
- 77-84 C (**Must pass the class with a 77 or higher to continue in the program)**
- 69-76 D
- 0-68 F

Course Outline

A. Hemodynamics of the heart

a. Pulmonary circulation
b. Systemic circulation
    i. Effect of systemic diseases on cardiovascular anatomy and physiology
c. Coronary Circulation
    i. Myocardial infarction
    ii. Abnormal wall motion
d. Types of flow
e. Factors affecting blood flow
    i. Pressure gradient
    ii. Stenosis
    iii. Preload
    iv. Afterload
f. Disease states affecting afterload and preload
    i. Clinical History
    ii. Physical Exam
    iii. Skin Integrity

B. Cardiovascular physiology
    a. IVCT
    b. Systole
    c. IVRT
    d. Diastole
    e. Cardiac function
        i. Heart rate
        ii. Stroke volume
        iii. Cardiac output
        iv. Cardiac index

C. Cardiac function and physiology
    a. Preload
    b. Afterload
    c. Propagation of electromechanical events
    d. Electrical events vs. mechanical events

D. Differential diagnosis in the echocardiographic examination
    a. Chest pain
    b. Edema
    c. Dyspnea on Exertion

E. Doppler echocardiography
    a. Doppler equation
    b. Types of Doppler
        i. Spectral Doppler
        ii. Color Flow Doppler
    c. PW Doppler
    d. CW Doppler
        i. HPRF Doppler

ii. Pedoff probe
e. Doppler angle
f. Aliasing
g. Types of flow

F. Normal and abnormal hemodynamics and flow patterns

G. Quantification by Doppler
a. Bernoulli's Formula
i. Pressure gradient
ii. RVSP
b. Poiseuille's Law
c. Stroke volume by Doppler
d. Continuity equation
e. Pressure half time
f. PISA

H. Embryology
a. Heart development
b. Fetal circulation
i. Foramen ovale
ii. Ductus arteriosus
iii. Ductus venosus
iv. Placenta
v. Pressures
c. Changes at birth
d. Persistent fetal circulation

I. Ergonomic knowledge and Techniques
a. Blackboard Journal Assignment
i. Industry standards and OSHA guidelines
ii. Types of WRMSKD
iii. Role of prevention of MSI in Admin.
iv. Role of prevention of MSI in Sonographers.
v. Best practices for prevention

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 Wi-Fi 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.

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.

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.

ADDITIONAL COURSE POLICIES/INFORMATION

1. No food, drinks, or use of tobacco products in class.

2. Cell Phones and any other electronic devices must be turned off while in class.

3. Do not bring children to class.

4. All assignments are due at the beginning of class and/or when stated in the syllabus. **LATE ASSIGNMENTS WILL NOT BE ACCEPTED and will result in a grade of ZERO!**

5. **Exam Administration and Attendance Policy**

   All exams will be conducted in person on the dates specified unless otherwise communicated by the instructor. Students are required to bring their own laptops to class on exam days and must have the most recent version of the Respondus LockDown Browser installed and functioning. If a student fails to attend a scheduled in-person exam, a penalty of 10 points per day will be deducted from their exam score until the exam is completed.

6. **Online Exam Policy**
   In the event that an exam is moved online, the use of a webcam in conjunction with the Respondus LockDown Browser will be required. If a student fails to complete the exam by the specified deadline, a grade of zero will be assigned after midnight on the due date. Prior to midnight, a deduction of 10 points per hour will be applied for late submissions, starting at the scheduled due time. **For example, if an exam is due at 7:00 PM and is submitted at 7:01 PM, the grade will be reduced by 10 points. If submitted at 8:00 PM, the deduction will be 20 points, and so on.** Note that the official due time will be determined by the individual instructor: the 7:00 PM time mentioned is for illustrative purposes only.

7. It shall be considered a breach of academic integrity (cheating) to use or possess on your body any of the following devices during any examination unless it is required for that examination and approved by the instructor: Cell phone, smart watch/watch phone, laptop, tablet, electronic communication devices (including optical), and earphones connected to or used as electronic communication devices.

8. **Cheating on any (lecture/lab) exam results in immediate dismissal from the program and an F for the course.**
   All exams will be online on Blackboard. You will be using LockDown Browser with Webcam Monitoring. The rules for the tests are:

- Disable all notifications on your computer. This is how LockDown Browser is used to take a test.
- Locate the "LockDown Browser" shortcut on the desktop and double-click it. (For Mac users, launch "LockDown Browser" from the Applications folder.)
- If prompted to close a blocked program (e.g. screen capture, instant messaging) choose Yes.
- Log into the course, navigate to the test and select it.
- A Startup Sequence will guide the student through a webcam check and other items required by the instructor.
- The test will then start.

20-point deductions for each occurrence:

- Where you are taking your exam must be well lit. If it is not well lit, you will have 20 points deducted from your test.
- Your face must be visible the entire length of the test. If your face cannot be seen even for a few seconds you will have 20 points deducted from your test.
- No music should be playing nor should a TV/radio/video be on in the background.
- You may not read the questions out loud. If you do so, you automatically receive a 20-point deduction.
- You may not wear sunglasses, hats, hoodies, earbuds, headphones, etc. during the exam. Your ears must be fully visible the entire exam, failure to comply with this will be a 20-point deduction. If you do this on another exam it will turn into a 50-point deduction.

50-point reduction or a zero on the entire test

- You must be in a private location. If another person is seen or heard while you are taking your test this could be misconstrued as cheating resulting in a 50-point reduction or a zero. That is up the situation and your instructor.
- All phones, notes, books, and other papers must be removed from the testing location. If these items are seen during your exam, you receive an automatic zero on the exam.
- Do NOT leave the exam room for any reason, if you do, it is an automatic 50-point deduction.
- Any suspicious activity that appears to be cheating will result in a zero.

Testing Tips

- You must use Google Chrome browser.
- You must have a webcam and a microphone attached to your computer.
- Be prepared to scan the room with a camera, if you cannot move your computer, you will need to have a mirror available to assist with scanning the room.
- It is the student's responsibility to ensure that ALL of the above requirements are met. By completing the verify signature portion of the exam, you are accepting responsibility for your actions during the exam. Failure to follow the requirements will result in deductions from your exam grade when reviewed by your instructor.

9. You will have the length of the class to finish an exam. No extra time will be given.

10. If you fail any test, you are required to get ahold of me and schedule a collaborate session/in person session to review the material. It is your duty to be prepared for this meeting.

11. Any taping of the material, when we go over tests/ results, will be considered cheating and you will be dismissed from the program. It is our duty to prepare you for the registry.

12. Students with special needs and/or medical emergencies or situations should communicate with their instructor regarding individual exceptions/provisions. It is the student's responsibility to communicate such needs to the instructor.

13. There will be no extra credit assignments given in this course.

14. Additional class policies as defined by the individual course instructor and sonography handbook.