



# Course Syllabus

**Course title:** Cardiac Sonography Procedures 2

**Class section:** MIDS - 247 - BX01A

**Term:** 2025S

**Course credits:** 3

**Total hours:** 75

**Delivery method:** Blended

## **Territorial acknowledgment**

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Camosun College respectfully acknowledges that our campuses are situated on the territories of the Lək̓ʷəŋən (Songhees and Kosapsum) and W̱SÁNEĆ peoples. We honour their knowledge and welcome to all students who seek education here.

## **Instructional hours**

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**Lecture hours:** 3 per W

**Lab hours:** 2 per W

W = Week

T = Term

## Instructor details

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**Name:** Matthew Barbas

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**Name:** Kendal Adam

**Email:** AdamK@camosun.ca

## Course description

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### Course Description:

Students continue developing their understanding of the clinical applications of cardiac sonography as a diagnostic investigation. Students observe dynamic anatomic relationships in the cardiac system while learning to recognize the abnormal sonographic appearances of the anatomy of the heart and the great vessels. Students learn to adapt and modify appropriate scanning protocols based on patient history, physiologic data, laboratory values, and complementary imaging studies.

### Prerequisites:

All of:

- C+ in MIDS 181
- C+ in MIDS 197

## Learning outcomes

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Upon successful completion of this course a student will be able to:

1. Explain the significance of abnormal cardiopulmonary hemodynamics on the approach to cardiac sonography and discuss the selection of adapted protocols, transducers, and impact on resultant sonographic image quality.
2. Explain how the abnormal sonographic appearance of the heart and great vessels relate to the corresponding ECG and are differentiated across gender, age (including fetal, infant, and occult cardiac defects), and body habitus.

3. Define and apply the components of a diagnostic examination to increasingly complex cardiac sonography encounters.
4. Describe the imaging principles, utilization, and interpretation of spectral Doppler, tissue Doppler imaging (TDI), strain/ strain-rate imaging, and ultrasound contrast on optimal and non-optimal subjects.
5. Perform uncomplicated cardiac ultrasound examinations and collect images and measurements necessary to formulate a technical impression of required cardiac structures within the recommended Sonography Canada guidelines for scheduling and time allotments while scanning simulated patients, live subjects, or laboratory partners.

## Competency mapping

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### **Sonography Canada Competencies:**

- 3.3f Set up 3-lead electrocardiogram (ECG).
- 3.3d Perform dynamic/provocative maneuvers (e.g., Valsalva).
- 4.1a Select optimum system and transducer for examination considering patient's age and size, structures being examined and specific indications for examination.
- 4.1b Determine and select correct pre-set values.
- 4.1c Input patient data.
- 4.2a Orient and manipulate transducer.
- 4.2b Perform sonographic examination of structures of interest using knowledge of sonographic principles, instrumentation and techniques listed in Appendices E.
- 4.2d Adjust instrument controls to optimize image.
- 4.2g Use software calculation packages.
- 4.2h Perform sonographic examinations using 3-D imaging.
- 5.1a Interpret history, signs & symptoms and other relevant information.
- 5.1b Assess medical history and health status.
- 5.1c Modify scope of examination based on clinical history.
- 5.1d Formulate sonographic scanning strategies.

- 5.1e Integrate knowledge of anatomy and disease processes.
- 5.3a Select optimal acoustic window.
- 5.3b Optimize patient position.
- 5.3c Employ breathing techniques.
- 5.3d Interrogate anatomy in required planes of section.
- 5.3e Evaluate images for orientation, identification, and labeling.
- 5.3f Evaluate images for quality.
- 5.3g Recognize sonographic appearance of normal structures.
- 5.3h Recognize artifacts and normal variants.
- 5.3i Differentiate artifact and normal variants from anatomic and pathologic findings.
- 5.3j Recognize and investigate abnormal findings.
- 5.3l Ensure all applicable components of examination are complete.
- 5.4a Produce diagnostic data documenting sonographic findings.
- 5.4b Formulate impression based on findings.
- 5.4c Understand the variables and their relationships within calculations.
- 5.4d Use spatial reasoning to interpret images.
- 6.2b Practice ergonomic techniques.

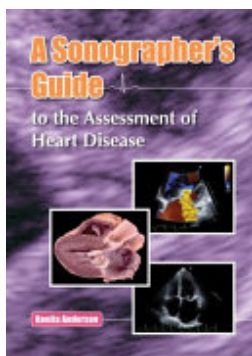
## Appendix E: Cardiac

- 1 Abdominal situs
- 2 Cardiac position
- 3 Chest & thorax (adjacent, extra-cardiac)
- 4 Coronary vessels
- 5 Hepatic veins
- 6 Outflow tracts

- 7 Pulmonary veins
- 8 Wall layers (endo, myo, pericardium)
- 9 Wall segments
- 10 Arch & branches
- 11 Ascending Aorta
- 12 Descending Aorta
- 13 Root
- 14 Left Atria
- 15 Right Atria
- 18 Main pulmonary artery
- 19 Bifurcation
- 20 Atrial Septum
- 21 Ventricular Septum
- 22 Aortic Valve
- 23 Mitral Valve
- 24 Mitral (annulus)
- 25 Pulmonic Valve
- 26 Tricuspid Valve
- 27 Tricuspid annulus
- 28 Inferior Vena Cava
- 29 Superior Vena Cava
- 30 Left Ventricle
- 31 Right Ventricle

## **Course reading materials**

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**Title:** A Sonographer's Guide to the Assessment of Heart Disease

**Authors:** Bonita Anderson

**Publisher:** Cardiotext Incorporated

**Publication Date:** 2014-01-01

**Required/Optional:** Required

## Course schedule

Week	Date (2025)	Topic	Readings	Learning Outcomes	Learning Objectives	Sonography Cana Competency
1	May 5	1. Aortic Stenosis	Ch. 7 pp. 177-194	a	8.0-8.8	
		LAB: Aortic valve doppler (PW & CW) + protocol review		c,d,e	7.0-7.6	3.3f, 4.1a,4.1b,4.1c 4.2a, 4.2b Appendi 8,9,15,27,30,31
2	May 12	1. Mitral Stenosis	Ch. 8 pp. 215-234	a	10.0-11.6	
		LAB: Mitral valve doppler (PW & CW) + protocol review		c,e	9.0	3.3f, 4.1a,4.1b,4.1c 4.2a, 4.2b Appendix E: 6,22
3	May 19	Victoria Day No Class  1. Tricuspid and Pulmonic Stenosis (Online)	Ch. 9 pp. 255-264, 277-283	a	10.0-11.6	
		LAB: Tricuspid & Pulmonic valve doppler		c,e		Appendix E: 5,10,11,12,28

		(PW & CW) + protocol review				
4	May 26	1. Principles of Valvular Regurgitation 2. Aortic Regurgitation	Ch. 9 pp. 255-264, 277-283 Ch. 7 pp. 197-213	a	10.0-11.6 12.0-13.7	
		LAB: Sweeping for valvular regurgitation and observing the apex		c,e		
5	June 2	1. Mitral Regurgitation 2. Tricuspid and Pulmonic Regurgitation	Ch. 8 pp. 235-253 Ch. 9 pp. 264-291	a	15.0-16.7	
		LAB: Echo Protocol Review				
6	June 9	1. Prosthetic Valves 2. Hypertensive and Pulmonary Heart Disease (online)	Ch. 10 Ch. 4	a	17.0-18.5	
		LAB: Scan Test #1		c,e	14.0-14.3	3.3f, 4.1a,4.1b,4.1c 4.2b Appendix E: 1 3,5, 6,7,8,9,10,11,12, 13,14.15,16 20,21,22,23,24

						25,26,27,28,30,31, 4.2d,4.2g,5.1a,5.1f  5.1c,5.1d,5.1e,5.3a  5.3b,5.3c,5.3d,5.3e  5.3f,5.3g,5.3h,5.3i,  5.3l,5.4a,5.4b,5.4d
7	June 16	Midterm Exam				
		LAB: Viewpoint Reporting + Echo Protocol		c,e	19.0-19.3	4.2 b Appendix E:  15,26,27,28,30,31,
8	June 23	1. Cardiomyopathies (Hypertrophic and Restrictive)	Ch. 6	a	20-20.7	
		LAB: Subcostal and Suprasternal Imaging Spectral Doppler Lab + Echo Protocol		c,e	21.0-21.3	4.2 b Appendix E:  8,9,  14,15,26,27,28,30, 4.2g,5.1a,5.1c,  5.1d,  5.1e,5.3d,5.3i,  5.3j,  5.4d
9	June 30	1. Cardiac Masses and Potential Cardiac Source of Embolus	Ch. 13	a	22.0-23.10	



		LAB: Systolic Function: Simpson's Bi-plane LVEF RV TAPSE, and RV TDI + Echo Protocol (Lab assignment #2 time after)		c,d,e	7.0-7.1,7.4,7.6	4.2 b Appendix E: 4.2g,5.1a,5.1c, 5.1d, 5.1e,5.3d,5.3i, 5.3j, 5.4d
10	July 7	1. Endocarditis	Ch. 13	a	22-23.1	3.3j, 4.2h
		LAB: Echo Simulator: Cardiomyopathies, Endocarditis, and cardiac masses (Lab assignment #3 time after)		c,d,e		3.3f, 4.1a,4.1b,4.1c 4.2b Appendix E: 8,9,30,31,4.2g
11	July 14	1. Ventricular Diastolic Filling and Function	Ch.3	a,d	1.0-1.14	5.4c
		LAB: Diastolic Function: LA volume, Apical with Spectral Doppler (Diastology: MV Inflow, P. Veins, TDI)		c,e	2.0-2.4	3.3f, 4.1a,4.1b,4.1c 4.2b Appendix E: 6,13,14,15,18, 20, 21,22, 23,25,26,30,31, 5.1
12	July 21	Diastolic Dysfunction	Ch.3	a,d	3.0-3.5	5.4c
		LAB: Review for Final		c,e	4.0-4.7	3.3d,3.3f, 4.1a,4.1b

		Scan Test				4.2a, 4.2b Appendix 6,7,8,9,  14,15,20,21,22,23,  27,30,31  4.2g
13	July 28	1. Review for Final Exam		a, d	5.0-6.3	
		LAB: Review for Final Scan Test				
14	Aug. 4	1. BC Day (No Class on Monday)		c,d,e		
		LAB: Scan Test 2				3.3f, 4.1a,4.1b,4.1c 4.2b  Appendix E: 1,3,5,  6,7,8,9,10,11,12,  13,14.15,16  20,21,22,23,24  25,26,27,28,30, 31    4.2d,4.2g,5.1a,5.1f  5.1c,5.1d,5.1e,5.3a  5.3b,5.3c,5.3d,5.3e  5.3f,5.3g,5.3h,5.3i,  5.3l,5.4a,5.4b,  5.4d,6.2b
15	August 11	FINAL EXAM				

## Assessment and evaluation

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Type	Description	Weight
Assignment	Lab Assignments (3)	10%
Quizzes	Online Quizzes (10)	10%
Examination	Scan Test (Scan Test 1 - 15%, Scan Test 2 - 20%)	35%
Examination	Midterm Exam	20%
Examination	Final Exam	25%

## Course guidelines and expectations

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Refer to the Diagnostic Medical Sonography (SONO) Program Handbook for classroom and lab etiquette as well as professional behaviour expectations.

Students must pass all Critical Criteria in the Professional Performance section, and achieve at least 65% on the Interrogation and Image Quality section and sub-sections of each Skills Assessment.

Students must achieve a minimum of 65% for their final grade to pass the course and to use this course as a pre or co-requisite.

There is weekly asynchronous material in the form of video lecture content, textbook readings and links to websites that must be reviewed to be successful in the course.

There are three lab assignments that are submitted to D2L. Late submissions will be subject to a penalty. Please contact me if you need an extension at least two weeks before the due date.

To achieve the program learning outcomes and course learning objectives, the use of generated artificial intelligence (AI) tools is prohibited unless explicitly stated on the course syllabus. If AI tools are used when not permitted, this would be a violation of Camosun College's Academic Integrity Policy and students may be subject to sanctions as per the policy.

Do not book travel or flights until the final examination schedule has been published by the registrar.

## School or departmental information

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Health & Human Services Student Handbook: <http://camosun.ca/learn/school/health-human-services/student-info/index.html>

General Practicum Information: <http://camosun.ca/learn/school/health-human-services/student-info/practicum-info.html>

Allied Health & Technologies Department Handbooks:

- Certified Medical Laboratory Assistant: <http://camosun.ca/learn/school/health-human-services/student-info/program-info/cmla.html>
- Diagnostic Medical Sonography: <http://camosun.ca/learn/school/health-human-services/student-info/program-info/sono.html>
- Medical Radiography: <http://camosun.ca/learn/school/health-human-services/student-info/program-info/mrad.html>

**Students enrolled in Allied Health & Technologies Programs must achieve a minimum of 65% or a “COM” in each of their courses to use their course as a pre-requisite and progress in their program.**

Students enrolled in Allied Health & Technologies Programs must participate in learning activities that include intimate and direct personal contact with their classmates during supervised practice. Students are training to perform the duties of a healthcare professional. These duties usually require constant, close physical contact with patients and clients. Students may be required to simulate and perform these activities on one another during this course. Students may also be required to use special hygiene practices and protective gear to protect themselves from the transmission of communicable diseases (like COVID-19). Risks associated with learning and performing the physical duties of a healthcare profession cannot be eliminated by any amount of caution or protection. Students who refuse or are incapable of participating and performing these activities due to personal or medical limitations, may only continue to participate in their course work when supported by officially registered accommodations or temporary medical advisory.

## **College policies and student responsibilities**

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The college expects students to be responsible, respectful members of the college community. Responsible students meet expectations about attendance, assignments, deadlines, and appointments. They become familiar with academic policies and regulations, and their rights and responsibilities.

College policies are available online at the [Policies and Directives](#) page. Academic regulations are detailed on the [Academic Policies and Procedures for Students](#) page.

Policies all students should be familiar with include the [Academic Integrity Policy](#). This policy expects students to be honest and ethical in all aspects of their studies. It defines plagiarism, cheating, and other forms of academic dishonesty. Infractions of this policy can result in loss of marks or a failing grade. To learn more about plagiarism and cheating, including the use of artificial intelligence, review the [Academic Integrity Guide](#).

The [Academic Accommodations for Students with Disabilities Policy](#) defines how Camosun provides appropriate and reasonable academic accommodations. The Centre for Accessible Learning (CAL) coordinates academic accommodations. Students requiring academic accommodations should request and arrange accommodations through CAL. Contact CAL at least one month before classes start to ensure accommodations can be put in place in time. Accommodations for quizzes, tests, and exams must follow CAL's booking procedures and deadlines. More information is available on the [CAL website](#).

Students must meet the grading and promotion standards to progress academically. More information is available in the [Grading Policy](#).

The college uses two grading systems. A course will either use the standard letter grade system (A+ to F) or a competency-based approach with grades of complete, completed with distinction or not completed. Visit the [Grades/GPA page](#) for more information.

Students must meet the college's academic progress standards to continue their studies. A student is not meeting the standards of progress when a GPA falls below 2.0. The college offers academic supports for students at risk of not progressing. The [Academic Progress Policy](#) provides more details.

If you have a concern about a grade, contact your instructor as soon as possible. The process to request a review of grades is outlined in the [Grade Review and Appeals Policy](#).

The [Course Withdrawals Policy](#) outlines the college's requirements for withdrawing from a course. Consult the [current schedule](#) of deadlines for fees, course drop dates, and tuition refunds.

If students experience a serious health or personal issue, they may be eligible for a [medical or compassionate withdrawal](#). The [Medical/Compassionate Withdrawal Request Form](#) outlines what is required.

The [Acceptable Technology Use](#) policy ensures the use of the college network and computers contribute to a safe learning environment. This policy also applies to the use of personal devices with the college network.

Students experiencing sexual violence can get support from the Office of Student Support. This Office of Student support is a safe and private place to discuss supports and options. More information is available on the [sexual violence support and education site](#). Students can email [oss@camosun.ca](mailto:oss@camosun.ca) or phone 250-370-3046 or 250-370-3841.

The [Student Misconduct Policy](#) outlines the college's expectations of conduct. Students should behave to contribute to a positive, supportive, and safe learning environment.

The [Ombudsperson](#) provides an impartial, independent service to help students understand college policies.

## Services for students

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Successful students seek help and access college services. These services are recommended to make the most of your time at college.

### Services for Academic Success

- [Career Lab](#): Connects students with work-integrated learning experiences, including co-op placements and career fairs.
- [English, Math, and Science Help Centres](#): Get one-on-one help with homework.
- [Library](#): Get help with research, borrow materials, and access e-journals and e-books. Libraries at both campuses provide computers, individual and group study spaces.
- [Makerspace](#): A place to innovate, collaborate, and learn new skills and technology in a fun, dynamic, inclusive environment.
- [Writing Centre & Learning Skills](#): Get assistance with academic writing or meet with a learning skills specialist for help with time management, preparing for exams, and study skills.

### Enrolment, Registration, and Records

- [Academic Advising](#): Talk to an academic advisor for help with program planning.
- [Financial Aid and Awards](#): Learn about student loans, bursaries, awards, and scholarships.
- [Registration](#): Get information about Camosun systems, including myCamosun, and college policies and procedures.
- [Student Records](#): Get verification of enrolment to access funding, request a transcript, or credential.

## Wellness and Cultural Supports

- [Counselling](#): It's normal to feel overwhelmed or unsure of how to deal with life's challenges. The college's team of professional counsellors are available to support you to stay healthy. Counselling is free and available on both campuses. If you need urgent support after-hours, contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.
- [Centre for Indigenous Education and Community Connections](#): Provides cultural and academic supports for Indigenous students.
- [Camosun International](#): Provides cultural and academic supports for international students.
- [Fitness and Recreation](#): Free fitness centres are located at both campuses.

For a complete list of college services, see the [Student Services](#) page.

## Changes to this syllabus

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Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change the course content or schedule. When changes are necessary the instructor will give clear and timely notice.