Course Syllabus

Course title: Sonography Principles & Instrumentation 2
Class section: MIDS **-** 199 **-** BX01C
Term: 2025W
Course credits: 3
Total hours: 75
Delivery method: Blended

Territorial Acknowledgement

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.

Instructor Details

Name: Dustin Pendergast
Email: Pendergastdustin@camosun.ca

Instructor Statement

As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.

Instructor Office Hours

Office:	Hours:
Room # 317	Hours: By Appointment

Course Description

Course Description:
Students investigate the physical principles and dynamics of fluid properties in diagnostic medical sonography. Students learn how relationships between volume, flow rate, density, and diameter relate to measurable anatomic variables using special calculations and techniques. Students study emerging ultrasound technologies and advanced scanning techniques to understand how these apply to future practice. Using their knowledge of factors necessary for successful image production, students examine how quality control protocols reduce conditions that can negatively affect image quality while learning how to conduct quality assurance testing and perform preventative maintenance.

Prerequisites:
All of:

- C+ in MIDS 139

Course Learning Outcomes / Objectives

Upon successful completion of this course, the learner will be able to

1. Explain and apply the fundamental principles of fluid properties as they pertain to generating diagnostic medical sonography images
2. Explain the influence of changing vessel diameters, flow rates and direction, pressure variables, and laminar flow on resultant image characteristics
3. Identify the appropriate situations in which to employ tissue harmonics, contrast, elastography, fusion, 4D, and other single purpose investigative tools; describe the principles used in obtaining images; and explain how this data is used
4. Describe the major components of comprehensive quality assurance programs and explain the role of preventative maintenance and quality control on image quality and equipment reliability

5. Describe the function and application of emerging technologies on sonography practice and contrast new approaches with prior investigative processes and explain how they impact patient outcomes

Course Competencies

Sonography Canada Competencies

4.3a Understand imaging and instrumentation activities included in quality assurance testing.

4.3b Identify degraded instrument performance.

4.3c Understand basic trouble shooting.

4.2d Adjust instrument controls to optimize image.

4.2h Perform sonographic examinations using 3-D imaging.

Course Materials
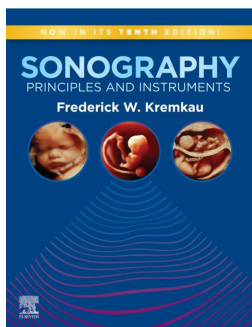
Title: Sonography Principles and Instruments
Authors: Frederick W. Kremkau
Publisher: Elsevier Health Sciences
Publication Date: 2016
Edition: 10th
Digital Object Identifier (DOI): 978-0-323-59708-1
Additional Information
REQUIRED TEXTBOOK

Course Schedule, Topics, and Associated Preparation / Activity

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

WEEK	DATE	LESSON	READINGS	LEARNING OUTCOMES	LEARNING OBJECTIVES	SONOGRAPHY CANADA COMPETENCY
1	Jan 6	Fundamental Principles of Fluid Properties, Volumetric Flow	Chapter 5	1	1.0-1.11 10.0-10.7	

		Rate, Continuity Rule, Fusion Imaging, Bernouli, Poiseuille's Law, Roleaux effect				
		No Labs, Week 1				
2	Jan 13 Asynchronous	Doppler Review Angle Correction for Doppler REVIEW	Chapter 5	2	2.0-2.12	
	Jan 14, 16	LAB: Doppler Review		1, 2	3.0	4.2d
3	Jan 20	Advanced Imaging Applications: Tissue Harmonics Imaging Doppler Applications: Wall Filters in Tissue Doppler and HPRF Doppler Colour Optimization REVIEW	Chapter 4	3	4.0-4.19	
	Jan 21, 23	LAB: Applying Doppler Image Corrections		3	5.0, 5.1	4.2d
4	Jan 27	Advanced Imaging Applications: Spatial Compounding, Real Time Adaptive Filters, Panoramic Imaging **QUIZ 1 (Asynchronous)**	Chapter 4	3	6.0-6.4	
	Jan 28, 30	LAB: Apply Spatial Compounding and Panoramic Imaging		3	7.0	4.2d
5	Feb 3	Advanced Imaging Applications: Elastography and Cardiac Strain Imaging, Shearwave, Fusion Imaging		3, 5	8.0-8.9	

		Asynchronous TBD				
	Feb 4, 6	LAB: Apply Elastography and Strain principles/shearwave		3	9.0	4.2d
6	Feb 10	Quality Assurance/Quality Control of Equipment Asynchronous TBD	Chapter 7	4	11.0-11.14	4.3a, 4.3b, 4.3c
	Feb 11, 13	LAB: General Purpose Ultrasound Tissue Phantom Testing; Prep for Lab Assignment 1		5		4.2d
7	Feb 17 No Labs	**Reading Week, No Classes*** ***MIDS 181 still in session**				
8	Feb 24	3D/4D Ultrasound Imaging High Intensity Focus Ultrasound	Chapter 4	3, 5	14.0-14.5	
	Feb 25, 27	LAB: 3D/4D Imaging; Prep for Lab Assignment 2		3	15.0	4.2d, 4.2h
9	Mar 3	Introduction to Interprofessional Assignment **QUIZ 2 (Asynchronous)**				
	Mar 4 (C&D) Mar 6 (A&B)	Interprofessional Lab @ 0930-1120 **C&D Sections** Lab Assignment 1 Due March 9 @ 11:59 PM		3	12.0	
10	Mar 10	Contrast Imaging, Bubble Studies	Chapter 2	3	13.0-13.19	

		Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value Asynchronous TBD				
	Mar 11 (A&B) Mar 13 (C&D)	Interprofessional Lab @ 0930-1120 **A&B Sections**		3	12.0	
11	Mar 17	Emerging Technologies in Sonography (ABUS,POCUS, A.I., Workflow in Reporting) Exam Review Assignment Introduction Interprofessional Assignment Due March 16 @11:59 PM		5	16.0-16.8	
	Mar 18, 20	LAB: Applying Doppler Corrections Clinically (REVIEW)		3	2.0-2.12, 5.1	4.2d
12	Mar 24	**Exam Review (Dustin)** Asynchronous TBD Lab Assignment 2 Due March 30@11:59 PM		1-5		
	Mar 25, 27	**No Labs, Week 12**				
13	Mar 31	**Exam Review Presentations (Student)**		1-5		

		Asynchronous TBD			
	Apr 1, 3	**No Labs, Week 13**			
14	Apr 7	**Cumulative Final**			
		No Labs, Week 14			

Evaluation of Learning: Weighted

DESCRIPTION	WEIGHTING
Quiz 1	15%
Quiz 2	15%
Lab Assignments (1 &2)	15%
Interprofessional Assignment	15%
Final Exam Review Assignment	10%
Final Exam	30%
TOTAL:	**100%**

NOTE: SONO Students must achieve at least a ("C+") or COM in all program courses.

Camosun's Grading Systems
https://camosun.ca/registration-records/student-records/camosun-grading-systems

Grade Reviews and Appeals
If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the **Grade Review and Appeals policy** for more information.
http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf

The Centre for Accessible Learning (CAL) is part of Camosun's Student Affairs unit. CAL coordinates academic accommodations and provides related programs and services to students with documented disabilities.

Students who require academic accommodations are expected to request and arrange accommodations through CAL in a timely fashion. While we understand that not all accommodation needs are known to students at the beginning of a course, accommodations cannot be provided unless the proper process is followed through CAL and an accommodation letter has been released to the instructor. Students are responsible for providing CAL with the proper documentation prior to the beginning of a course.

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced noticed is required.

Deadlines can be reviewed on the CAL exams page
https://camosun.ca/services/academic-supports/accessible-learning/academic-accommodations-exams

Please consult the CAL webpage for more information:
https://camosun.ca/services/academic-supports/accessible-learning

Artificial Intelligence: A Guide for Students

Generative Artificial Intelligence (GenAI) is an evolving technology that brings potential benefits but also substantial risks. While GenAI tools have the ability to transform how we work and learn, it is essential for the college community to adapt to these changes in a thoughtful and secure way.

When using GenAI tools, students should ensure proper citation and attribution guidelines are followed. This includes acknowledging AI assistance in reports ,presentations, or any external communications. Clear citation helps build trust, ensures ethical use, and reduces the risk of misinformation or copyright issues.

For citation support visit the college's citation style guide.
https://camosun.libguides.com/cite

Artificial Intelligence: A Guide for Students
Visit the following website to learn about AI use in academic settings.
https://camosun.libguides.com/artificialintelligence/home

Course Guidelines & Expectations

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 entirely 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.

Asynchronous Materials

Except for Week 1, asynchronous materials should be accessed prior to the Monday lectures. This will give students opportunity to ask questions in class that may have arisen from the asynchronous materials.

Late Assignments/Assessments

Late assignments will not be accepted and the student will be assessed a zero (0%) for the late assignment. Should there be a significant extenuating circumstance, the student MUST contact the instructor prior to the assignment due date, with as much notice as possible.

Professionalism & Participation

A key component of being a successful student and healthcare worker is demonstrating professional behaviours and actively engaging in classroom, laboratory and clinical activities. Examples of these behaviours are: asking questions in class, actively participating in group or lab activities, participating in class discussions, responding to emails in a timely fashion, respecting laboratory dress code, speaking and engaging respectfully with classmates and instructors, and using effective communication skills.

School or Departmental Information

Students are required to read and are accountable for the College policies (outlined below) and practicum guidelines as described in the School of Health and Human Services (HHS) and program handbooks.

[SONO Program Handbook](#)

Clinical and Practice Placements in HHS
https://camosun.ca/programs-courses/school-health-and-human-services/hhs-programs/practicums

School of Health and Human Services (HHS)
https://camosun.ca/programs-courses/school-health-and-human-services/information-health-and-human-services-students-1#top

Student Responsibility

Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

College Policies

Academic Integrity

Students are expected to follow the college's [Academic Integrity policy](#), and be honest and ethical in all aspects of their studies. To help you understand these responsibilities review the online [Academic Integrity guide](#).

The college's [Academic Integrity policy and supporting documents](#) detail the process for addressing and resolving matters of academic misconduct.

Academic Accommodations for Students with Disabilities

If you have a documented disability and need accommodations contact the Centre for Accessible Learning (CAL). CAL will arrange the appropriate academic accommodations so you can participate in all academic activities. Visit the [CAL website](#) for more information

Academic Progress

The [Academic Progress policy](#) details how the college monitors students' academic progress and what steps are taken if a student is at risk of not meeting the college's academic progress standards.

Acceptable Technology Use

The [Acceptable Technology Use](#) policy outlines how students are expected to use college technology resources, this includes using your own devices on the college's network. The use of the college resources in a way that violates a person's right to study in an environment free of discrimination, harassment or sexual violation is prohibited.

Course Withdrawals Policy

For details about course withdrawal see the [Course Withdrawals policy](#). Be aware of the [deadlines for fees, course drop dates, and tuition refunds](#).

Grading Policy

To learn more about grading see the [Grading Policy](#).

Grade Review and Appeals

The process to request a review of grades is outlined in the [Grade Review and Appeals policy](#).

Medical / Compassionate Withdrawals

If you have experienced a serious health or personal issue, you may be eligible for a [medical/compassionate withdrawal](#). The [Medical / Compassionate Withdrawal Request form](#) outlines what is required.

Sexual Violence

If you have experienced sexual violence on or off campus, you can get support from the Office of Student Support. The Office of Student Support is a safe and private place to talk about what supports are available and your options for next steps. Visit the [sexual violence support and education site](#) to learn more or email oss@camosun.ca or phone: 250-370-3046 or 250-370-3841.

Student Misconduct (Non-Academic)

Camosun expects students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Review the [Student Misconduct Policy](#) to understand the college's expectations of conduct.

Looking for other policies? See [Camosun College Policies and Directives](#)

Services and Supports

Services are free and available to all students.

Academic Supports	Enrollment Supports
[Centre for Accessible Learning](#)	[Academic Advising](#)
[English, Math and Science Help Centres](#)	[Financial Aid and Awards](#)
[Library](#)	[Registration](#)
[Writing Centre & Learning Skills](#)	[Tuition and Fees](#)
Health and Wellness	**Applied learning**
[Counseling](#)	
[Fitness and Recreation](#)	[Co-operative Education and Career Services](#)

Office of Student Support	Makerspace

The [Centre for Indigenous Education Centre and Community Connections](#) provides cultural and academic supports for Indigenous students.

[Camosun International](#) provides supports to international students.

[The Ombudsperson](#) provides an impartial, independent service to ensure students are treated fairly. The service is a safe place for students to voice and clarify concerns and complaints.

If you have a mental health concern, contact Counselling. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

Changes to this Syllabus

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.