

CLASS SYLLABUS



COURSE TITLE: DHYG 231 Radiology in Dental Practice
CLASS SECTION: X01 — Wednesdays 8:30-9:20am
& Thursdays 1:00-2:20pm
TERM: W2023
COURSE CREDITS: 3.0
DELIVERY METHOD(S): Synchronous class to be delivered on-site whenever possible

Camosun College campuses are located on the traditional territories of the Ləkʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.
Learn more about Camosun's [Territorial Acknowledgement](#).

For COVID-19 information please visit: <https://camosun.ca/about/covid-19-updates>

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.

INSTRUCTOR DETAILS

NAME: Margit Strobl
EMAIL: stroblm@camosun.ca
OFFICE: DNT 006
HOURS: By appointment

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.

CALENDAR DESCRIPTION

Students will examine the principles of x-ray generation, radiation biology and uses of imaging in dentistry. Students learn a variety of imaging techniques in order to produce diagnostic images of oral structures. Students discuss legal requirements, ethical issues, and radiation safety and protection as they pertain to dental practice. Learners are also introduced to radiographic interpretation of dental structures and the surrounding tissues.

PREREQUISITE(S): B- in DHYG 219, B- in DHYG 220
CO-REQUISITE(S): n/a
PRE/CO-REQUISITE(S): B- in BIO 260, B- in DHYG 221, B- in DHYG222

COURSE DELIVERY

ACTIVITY	HOURS / WEEK	# OF WEEKS	ACTIVITY HOURS
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Lecture	2.5	17	42.5
Seminar			
Lab / Collaborative Learning			
Supervised Field Practice			
Workplace Integrated Learning			
Online			
	TOTAL HOURS		42.5

COURSE LEARNING OUTCOMES

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

- a) Discuss fundamental principles of radiology as they pertain to dental practice.
- b) Describe radiation biology and the uses of x-radiation in dentistry to maintain a safe environment.
- c) Describe concepts, principles and applications of radiography techniques and radiographic imaging in dentistry.
- d) Describe adaptations or modifications to oral radiography techniques for successful imaging for clients with special needs.
- e) Examine legal requirements and ethical issues related to oral radiography in relation to dental hygiene practice.
- f) Utilize foundational knowledge in order to examine diagnostic images of oral structures.
- g) Apply systematic methods for interpreting radiographs in dental practice.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

Iannucci J.M., Howerton L. (2022). Dental radiography: principles and techniques (6th Ed.). St. Louis Missouri. Elsevier. ISBN: 978-0-323-69550-3

COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

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

ACTIVITY

1. Discuss fundamental principles of radiology as they pertain to dental practice.

History of radiation:

- Describe briefly the history of x-radiation and radiography identifying the discovery of x-rays and improvements in techniques to date.

Radiation physics

- Describe the physics of radiation in terms such as atomic structure as it pertains to the production of x-radiation.
- Define ionizing radiation and the concept of ionization.
- Explain the relationship between x-radiation and other sources of electromagnetic radiation using the electromagnetic spectrum.
- Describe characteristics of short and long wave x-rays, specifically those of x-radiation.

Generation of x-radiation

- Describe the generation of x-radiation including electrical terms and equipment required for production.
- Describe in detail the x-ray tube, its' components, and their functions.
- Describe conditions that must exist for the production of x-radiation and explain, in a simplified manner, how x-radiation is produced.
- Name and describe the two ways in which x-rays are produced; Bremsstrahlung and Characteristic.
- Explain the effect of increased and decreased kilovoltage (kV), milliamperage (mA) and time (s) on the quality and quantity of x-radiation produced.
- Describe ways in which x-rays interact with matter including the Photoelectric effect, Compton scatter and Unmodified (Coherent) scatter.

2. Describe radiation biology and the uses of x-radiation in dentistry to maintain a safe environment.

Radiation biology:

- Differentiate between background and man-made radiation.
- Describe direct and indirect theories of biological effects of radiation.
- Define radiation biology and discuss the potentially harmful effect of any exposure to radiation including factors that influence the body's response.
- Discuss the cellular response to radiation including genetic, somatic and carcinogenic.
- Discuss the radio-sensitivity of various cells and tissues.
- Describe the effects of radiation therapy on oral tissues.

Uses of radiation in dentistry:

- Briefly define exposure, dose and dose equivalence using SI units and traditional units of radiation measurement.
- Discuss the amounts of radiation used in dental radiography.
- Discuss the need for radiation protection standards for the public and operators of x-radiation equipment.
- Define primary beam, secondary radiation, scatter radiation and leakage radiation.
- Relate the characteristics of x-rays to their use in dentistry.
- Describe the risks and benefits of dental radiographs.
- Discuss the ALARA concept and describe ways of applying the concept to reduce radiation exposure to the dental client.
- Discuss ways dental office personnel can protect themselves from x-radiation.
- Discuss quality assurance mechanisms as a part of radiation protection.

3. Describe concepts, principles and applications of radiography techniques and radiographic imaging in dentistry.

Concepts/principles of radiographic imaging:

- Define density, contrast and detail(definition) and describe imaging factors affecting each.
- Discuss terms used to describe quality of radiographic images (umbra, penumbra, magnification, etc.).
- Discuss and apply the concepts of the inverse square law.
- Relate the quantity and quality of x-radiation produced by increased and decreased kV, mA and time to image quality.

Traditional film imaging:

- Describe traditional radiographic film composition including the sensitivity of film emulsion (film speed).
- Describe the concept of latent image.
- Discuss the storage and handling of radiographic film.
- Describe film processing identifying chemical reactions that occur on film during the various steps.
- Describe the composition and care of solutions used for automatic processing.
- Discuss requirements and quality control for the darkroom.

- Describe and identify causes for processing errors on finished radiographs.

Digital imaging:

- Discuss digital intra-oral radiography techniques
- Describe radiographic imaging using digital technology.
- Differentiate between the two types of intra oral technology (PSP and CCD 'sensor').
- Discuss how a computer stores the radiographic images.

Advanced imaging techniques:

- Discuss reasons for the development of alternate imaging techniques other than conventional radiography as it pertains to dentistry.
- Describe and discuss the use of the following techniques as they are used in dentistry; contrast media (angiography, sialography, etc.) computerized tomography, subtraction techniques, ultrasound, magnetic resonance imaging and positron emission tomography (nuclear medicine).

Radiography techniques:

- Identify various types and sizes of intra-oral film and packaging.
- Describe characteristics of periapical and bitewing radiographs and discuss uses for each in dentistry.
- Describe rationale and methodology for the paralleling technique.
- Describe rationale and methodology for the bitewing technique.
- Describe principles, indications and limitations of bisecting the angle technique.
- Discuss the methods used for extra-oral radiographic digital imaging.
- Describe uses of extra-oral radiographs in dentistry.
- Describe the principles, indications and limitations of panoramic radiographs.
- Describe the techniques, indications and limitations of occlusal radiographs.
- Describe radiographic techniques used for endodontics.
- Describe the purpose and technique of lateral jaw radiographs, cephalometric radiographs and temporomandibular joint radiographs.
- Describe methods used to localize abnormal radiographic findings, including the 'Buccal Object Rule'.
- Describe the disto-molar technique for taking radiographs on third molar.

4. Describe adaptations or modifications to oral radiography techniques for successful imaging for clients with special needs.

Modifications:

- Describe radiographic techniques for edentulous clients.
- Describe modifications to radiographic techniques for children.
- Describe modifications to radiographic techniques that may be required for clients with special medical, physical or intra-oral needs.

5. Examine legal requirements and ethical issues related to oral radiography in relation to dental hygiene practice.

- Describe the main legal and ethical issues related to dental radiography.
- Briefly describe how radiographs are used during the assessment, planning, implementation and evaluation phases of preventive dental care.
- Identify rationale to determine the need for radiographs.
- Explain "informed consent" as it relates to oral radiographs and describes issues related to informed consent.
- Define the client's and dentist's ownership rights of radiographic records.

6. Utilize foundational knowledge in order to examine diagnostic images of oral structures.

- Describe the terms radiopaque and radiolucent and apply these terms to structures on dental radiographs.
- Identify normal soft and hard tissues and structures on a full mouth set of radiographs differentiating between mandibular and maxillary anatomy.
- Describe radiographically, normal variations to anatomic landmarks including foramina, sinuses, trabecular patterns, etc.

7. Apply systematic methods for interpreting radiographs in dental practice.

- Discuss handling of processed radiographic images and correct mounting procedures.
- Define and differentiate between "diagnosis" and "interpretation" as they pertain to dental radiographs.
- Discuss a systematic method for interpreting radiographs.
- Describe and apply correct descriptive terminology in interpreting radiographs.
- Describe how to use the problem-solving process to distinguish normal from abnormal conditions.

- Describe the radiographic appearance of common anatomic variations that mimic pathology.
- List dental materials that appear either radiopaque or radiolucent.
- Identify radiographically, dental restorations and materials as accurately as possible.

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 notice is required. Deadlines can be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

STUDENT EVALUATION

NOTE: minimum passing grade for this course is B- or 70% OR COM

DESCRIPTION	WEIGHTING
Assignment	15%
Term test #1	25%
Term test #2	25%
Final exam	35%
TOTAL	100%

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](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) policy for more information. <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

COURSE GUIDELINES & EXPECTATIONS

Please refer to the student handbook for information regarding supplemental exams.

SCHOOL OR DEPARTMENTAL INFORMATION

See D2L for more information

Students are required to read and are accountable for following College policies and guidelines as described in the DHYG and HHS Student Handbooks.

[CDA Student Handbook](#)

[HHS Student Handbook](#)

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.

SUPPORTS AND SERVICES FOR STUDENTS

Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Support Service	Website
Academic Advising	http://camosun.ca/advising
Accessible Learning	http://camosun.ca/accessible-learning
Counselling	http://camosun.ca/counselling
Career Services	http://camosun.ca/coop
Financial Aid and Awards	http://camosun.ca/financialaid
Help Centres (Math/English/Science)	http://camosun.ca/help-centres
Indigenous Student Support	http://camosun.ca/indigenous
International Student Support	http://camosun.ca/international/
Learning Skills	http://camosun.ca/learningskills
Library	http://camosun.ca/services/library/
Office of Student Support	http://camosun.ca/oss
Ombudsperson	http://camosun.ca/ombuds
Registration	http://camosun.ca/registration
Technology Support	http://camosun.ca/its
Writing Centre	http://camosun.ca/writing-centre

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

COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the [Centre for Accessible Learning](#) (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course

instructors. Please visit the CAL website for contacts and to learn how to get started:

<http://camosun.ca/services/accessible-learning/>

Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

Academic Progress

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

Course Withdrawals Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <http://camosun.ca/learn/fees/#deadlines>.

Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.

Grade Review and Appeals

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures" (<http://camosun.ca/learn/calendar/current/procedures.html>) and the Grading Policy at <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf>.

Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf> to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them

understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf> and camosun.ca/sexual-violence. To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-370-3841

Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf> to understand the College's expectations of academic integrity and student behavioural conduct.

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 courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.