



DHYG 221 Oral Sciences 1
Winter 2019

COURSE OUTLINE

The course description is available on the web:
<http://camosun.ca/learn/calendar/current/web/dhyg.html#dhyg221>

⌘ Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

1. Instructor Information

- (a) **Instructor** Beverly Jackson
(b) **Office hours** TBA
(c) **Location** D004 Dental Building
(d) **Phone** 250 370-3507 **Alternative:** 250 915-5636
(e) **E-mail** jacksonb@camosun.bc.ca
(f) **Website** D2L

2. Course Description & Intended Learning Outcomes

In this course embryological development and the oral histology of the soft and hard tissues of the mouth and associated structures are studied in the context of health. Developmental and acquired disturbances of dental and oro-facial structures are also studied. Pathological conditions related to dental caries, and other tooth abnormalities are also examined.

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

- a) describe the concepts and principles of histology as they relate to the soft and hard tissues present in the oral cavity for base knowledge of structure as it relates to clinical function.
- b) discuss the embryological formation of the tissues of the body to enhance knowledge of typical and atypical dental and oral development.
- c) describe the development of dental and oral structures and their relationship to oral health and client care.
- d) describe of dental caries and other pathological conditions of the teeth and their implications for dental hygiene practice.

Course Elements

1. Describe the concepts and principles of histology as they relate to the soft and hard tissues present in the oral cavity for base knowledge of structure as it relates to clinical function.

➤ Describe histological study of tissues.

- Explain histological study of tissues and identify common methods used to study dental tissues.
- Identify and discuss basic components of tissues and their appearance in histological slides.
- Explain uses for the histological study of tissues in determining dental/oral health and disease.

➤ Identify the histological features of oral mucosa.

- Recall basic knowledge of cells and tissues (biology pre-requisite).
- Describe and compare the histological structure of keratinized, parakeratinized and nonkeratinized epithelium (recall from DHYG 219).
- Describe the histological structure of the lamina propria and discuss its function.
- Describe the basement membrane and identify differences in its structure for various types and locations of oral mucosa (recall from DHYG 219).
- Compare mobile and non-mobile oral mucosa and relate structure to degree of mobility.
- Describe submucosa and differentiate structures that may be present in this component of lining, specialized and masticatory mucosa.
- Describe histologic structure of the hard palate and compare with those of the gingiva.
- Describe the histologic structure and function of the salivary glands and their distribution.

➤ Describe the histological features of the dentogingival unit and relate histological features of healthy gingiva to clinical characteristics.

- Recall knowledge of the gingiva including histology, arrangement of gingival fibers etc. (from DHYG 219)
- Describe the histological structure of the junctional epithelium and its attachment to the tooth (recall from DHYG 219).
- Describe passive eruption and changes in the position of the epithelial attachment.
- Describe renewal rate of gingival and junctional epithelium (recall from DHYG 219).
- Relate histological features of healthy gingiva to its clinical appearance.

➤ Describe histological features of the tissues of the periodontium, other than gingiva, including periodontal ligament and alveolar bone and relate to clinical and radiographic characteristics .

- Recall structure and functions of the periodontal ligament including types and directions of periodontal ligament fibers (from DHYG 219).
- Identify structural and cellular elements of the periodontal ligament and their function.
- Describe the attachment of the periodontal ligament fibers to cementum and bone.
- Discuss clinical significance of the periodontal ligament including response to injury and other clinical situations.
- Recall knowledge of alveolar bone including types and location (from DHYG 219).

- Describe the histologic structure of alveolar bone and explain the clinical significance of alveolar bone levels.
- Describe bone formation and resorption and discuss reasons for their occurrence.
- Recall fenestration and dehiscence and discuss histology and clinical significance of each.
- Describe clinical variations of the alveolar bone, including tori.
- Identify and describe the radiographic appearance of ankylosis and hypercementosis and relate clinical significance.
- Explain the similarities of cementum and bone and the relationship that occurs with the periodontal ligament.

➤ **Describe the histological features of tooth tissues including enamel, dentin, cementum and pulp.**

- Recall the location, composition and macroscopic structure of enamel (from DHYG 219 and 220)
- Describe the histological structure of enamel, including enamel rods, incremental lines, tufts, lamellae and spindles.
- Describe the histologic structure of the dentinoenamel junction.
- Explain the clinical importance of enamel and discuss changes that occur with wear and/or age.
- Recall the location and composition of dentin (from DHYG 220).
- Describe the histological structure of dentin, including predentin, the dentinal tubule, peritubular, intertubular, mantle and circumpulpal dentin, tomes granular layer and incremental lines.
- Explain the clinical importance of dentin and describe changes that may occur with function and/or age.
- Recall knowledge of cementum (from DHYG 219).
- Compare histological structure and location of cellular and acellular cementum.
- Describe and discuss age related changes that occur with cementum including resorption and repair.
- Recall location and composition of pulp (from DHYG 219)
- Describe the formative, sensory, nutritive, and defensive functions of the pulp.
- Explain the clinical importance of the pulp and discuss changes that occur with trauma and/or age.
- Describe pulp calcifications including types and etiology and discuss clinical significance.
- Describe and identify the radiographic appearance of various pulp calcifications.

2. Discuss the embryological formation of the tissues of the body to enhance knowledge of typical and atypical dental and oral development.

- Explain formation of the primary germ layers beginning with the development of the primitive streak and identify oral tissues that will be derived from these tissue layers: ectoderm, mesoderm and endoderm.
- Describe briefly the formation of the neural tube and the contribution of neural crest cells to facial development.
- Describe formation of the 5 branchial arches.
- Describe embryonic development of the face, palate, and tongue including formation and growth of processes to migration and merging or fusion of tissues.
- Differentiate between two types of fusion that occur during embryonic development.

- Describe in detail the formation of the following; upper lip, primary palate and palatal processes, hard palate and nasal septum.
- Explain the origin of the thyroid gland and the pituitary gland.
- Describe the origin and the development of orofacial cysts.
- Identify several areas cysts may form (from embryonic tissues/structures to the adult structures of the head and neck).
- Be aware of the various possible cleft lip and palate types and frequency of each.
- Discuss medical treatment and the clinical significance of caring for clients with treated and untreated clefts.
- Describe disruptions in embryonic development of the tongue that cause anomalies of the tongue and discuss clinical significance.
- Describe other oral anomalies that may occur during development and may have an affect on clinical care such as: fordyce's granules, epithelial rests, macrostomia and microstomia.

➤ **Describe the development of dental and oral structures and their relationship to oral health and client care.**

- Define terms associated with development of dental hard tissues: histodifferentiation, morphodifferentiation, initiation, proliferation, apposition, calcification, odontogenesis, dentinogenesis, amelogenesis and cementogenesis.
- Describe development of the tooth crown during the various stages of formation; the dental lamina, bud, cap and bell stages.
- Describe the process of dentinogenesis and amelogenesis from initiation to crown completion.
- Describe formation of the reduced enamel epithelium and the enamel cuticle, and discuss their significance.
- Identify the relationship of the permanent to the primary tooth germs.
- Describe development of the tooth root explaining sequencing and location of component structures; pulp, root dentin and cementum.
- Define the terms: hertwig's epithelial root sheath (HERS), epithelial diaphragm, epithelial rests (rests of Malassez).
- Describe the development of single versus multiple roots.
- Describe development of the periodontal ligament identifying the orientation of fibers during the stages of eruption.
- Describe the development of the alveolar bone and explain the relationship between bone, tooth root development and eruption.
- Discuss various mechanisms that may be responsible for tooth eruption.
- Describe the eruption process in the various stages (pre-eruptive, active and functional eruptive).
- Describe the exfoliation process.
- Recall the eruption sequence of deciduous and permanent teeth (from DHYG 220).
- Describe abnormalities in eruption and exfoliation and their etiologies.
- Identify radiographically stages of tooth crown and root development.
- Describe eruption factors that influence the development of occlusion.
- Recall the relationship between ideal tooth alignment and normal occlusal stresses (DHYG 220)
- Describe passive eruption and identify types of post-eruptive tooth movements and their influences on occlusion or on periodontal health.
- Describe variations in eruption including drift, migration, impaction and delayed eruption and identify clinically and recognize radiographically.

➤ **Describe histological and embryological features of the temporomandibular joint (TMJ)**

- Recall knowledge of the TMJ (from DHYG 219).
- Describe the histologic structure of the major component structures of the TMJ including the articular surfaces, disc and capsule.
- Briefly describe the embryologic development of the TMJ and identify differences between adult and the fetal TMJ.
- Explain abnormalities that may develop in the TMJ.

3. Describe dental caries and other pathological conditions of the teeth and their implications for dental hygiene practice.

➤ **Explain dental caries**

- Describe dental caries epidemiologically, as a chronic, infectious disease.
- Describe etiological factors of dental caries and their inter-relationship.
- Describe the oral ecology and the role of specific microorganisms in the development of caries (recall microorganisms from Biol 160).
- Describe demineralization as the accepted theory of cariogenesis.
- Describe the types of foods most often associated with caries.
- Draw a diagram illustrating the interaction of sucrose and bacteria in the oral cavity over time (Stephan curve).
- Describe the susceptibility of tooth surfaces and factors that affect their resistance.
- Describe the protective mechanisms of saliva and the effect of lack of this resource.
- Describe the pathological development, clinical characteristics and morphology of plaque associated with pit and fissure caries, smooth surface caries and cementum caries (root surface caries).
- Recall protective mechanisms of the dentin including sclerotic and reparative dentin.
- Define types of caries including chronic, acute and arrested.
- Describe the clinical signs and symptoms of caries.
- Identify on images, obvious clinical signs of various types of caries.
- Recall microbiological tests used to assess or monitor caries activity (Biol 160) and discuss uses in clinical dental hygiene.
- Describe preventive and restorative approaches to dental caries.

➤ **Describe and interpret the radiographic appearance of dental caries.**

- Describe the limitations of using radiographs to diagnose dental caries.
- Describe conditions or effects that imitate caries on radiographs including their appearance and significance.
- Describe the radiographic appearance of all types and stages of dental caries.

➤ **Describe the development of dental and oro-facial anomalies, including acquired disturbances and discuss their relationship to dental health and client care.**

- Identify clinical concerns or abnormalities in crown formation related to the development of dental tissues.
- Describe the etiology, characteristics and significance of enamel and dentin hypoplasias and hypocalcification including dysplasias.

- Explain abnormalities in root formation including enamel pearls, extra roots, dilaceration, concrescence, and root resorption (recall DHYG 220).
- Describe and differentiate characteristics of acquired tooth abnormalities in terms of etiology, diagnosis, clinical features and treatment of the following: attrition, abrasion, erosion, and abfraction.
- Identify on photographs and radiographs developmental and acquired abnormalities of dental structures

3. Required Materials

(a) Texts:

Fehrenback, M. & Popowics, T. (2016). *Illustrated dental embryology, histology, and anatomy*. 4th Ed. Missouri: Elsevier Saunders.

Fehrenbach MJ, Herring SW. (2017). *Illustrated anatomy of the head and neck*. 5th Ed. Missouri: Elsevier.

Darby M., Walsh M. (2015). *Dental hygiene theory and practice*. 4th Ed. St. Louis: Saunders Elsevier.

Iannucci J, Howerton L. (2017). *Dental radiography principles and techniques*. 5th Ed. St. Louis: Elsevier.

(b) Other:

DHYG 221 Workbook & Study Guide (2019 edition) is available through the Camosun College Bookstore.

The D2L website will be used for posting additional course information.

4. Course Content and Schedule

- Calendar Description: In this course embryological development and the oral histology of the soft and hard tissues of the mouth and associated structures are studied in the context of health. Developmental and acquired disturbances of dental and oro-facial structures are also studied. Pathological conditions related to dental caries, and other tooth abnormalities are also examined.
- iii) Pre / Co-requisites: Biol 260, DHYG 222, DHYG 231, DHYG 280, DHYG 281
- Course Particulars
 - Credits: 2_0
 - Components: Class Hours: 2 hours per week / Seminar hours 2 / Practicum hours 0 / Out of class hours 2 per week.

A weekly schedule of classes will be distributed separately. Students are expected to be prepared for class by reading and completing related text references and manual for each class.

5. Basis of Student Assessment (Weighting)

- a. Assignments - none
- b. Evaluation: Term Test #1 30%
 Term Test #2 35%
 Final Exam 35%

All tests / exams will include a combination of question format (examples are multiple choice / short answer and matching types of questions). There may also be slides of clinical or radiographic features for the concepts described in the course elements. There are no assignments for this course.

The minimum grade for successful completion of DHYG 221 is B- or 70%.

6. Grading System

- Standard Grading System (GPA)
- Competency Based Grading System

7. Recommended Materials to Assist Students to Succeed Throughout the Course

TBA

8. College Supports, Services and Policies

Immediate, Urgent, or Emergency Support



If you or someone you know requires immediate, urgent, or emergency support (e.g., illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts:

<http://camosun.ca/about/mental-health/emergency.html> or
<http://camosun.ca/services/sexual-violence/get-support.html#urgent>

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, centre for accessibility, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit Student Services at <http://camosun.ca/services/>

College Policies

Policies are available on the College website at <http://camosun.ca/about/policies/>

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies.

Education and academic policies include, but are not limited to, [Academic Progress](#), [Admission](#), [Course Withdrawals](#), [Student Appeals](#), Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, and Student Penalties and Fines.

Student Conduct Policy

There is a [Student Conduct Policy](#). It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, Registration, and on the College website.

iii) GRADING SYSTEMS

<http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf#page=2>

The following two grading systems are used at Camosun College:

1. **Standard Grading System (GPA)**

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-	Minimum passing Grade for Dental Courses	4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F		0

2. **Competency Based Grading System (Non GPA)**

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes.

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

➤ **Temporary Grades**

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://www.camosun.bc.ca/policies/E-1.5.pdf#page=4> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.