

Course Code: DHG 111

Course Title: Oral and Dental Anatomy, Histology and Embryology

Department: Allied Health

Effective Date: Summer 2026

PCS Code: 1.2 - Occupational/Technical Instruction

CIP Code: 51.0601

Repeatability: 0

Credit Hours

Catalog Notation: 2-2-3

Credit Hour Distribution:

Lecture: 2

Lab: 2

Clinical: 0

Total: 3

General Course Information

Catalog Description

Terms and anatomic structures of the oral cavity, including detailed study of crown and root morphology of both primary and permanent dentitions. An introduction to development of the human organism with emphasis on face, teeth, and supporting periodontal structures. Application of oral histology and oral anatomy in assessing patient's oral health.

General Course Objectives

1. Identify the embryonic processes of the head and neck.
2. Describe the developmental process for cells of dental origin.
3. Identify the histological components of the periodontal attachment mechanism.
4. Locate and identify the major salivary glands, ducts, and orifices of the oral cavity including microscopic cell development.
5. Describe the function and structure of the hard and soft tissues of the periodontium.
6. Define and identify the oral structures including enamel, dentin, cementum, and pulp tissues.
7. Identify all permanent and primary teeth including pits, cusps, fossa, grooves, ridges, root morphology, and associated tooth structures.
8. Demonstrate ability to chart permanent, mixed, and primary dentition using different charting techniques and numbering systems.
9. Describe and classify various occlusions.

Minimum Placement Levels

English	Reading	Math
Placement out of ENG 099	Placement out of CCS 099	None

Prerequisites

Credit in BIO 121

Admission into the Dental Hygiene program

Methods of Evaluation

8-10 weekly objective multiple choice quizzes, 3 objective multiple choice exams, 2 discussion board assignments, 2-3 case study assignments, 1-2 review assignments, 4 practical assessments, and 1 research paper.

Instructional Materials and Additional Supplies

- Illustrated Dental Embryology, Histology, and Anatomy, Fehrenbach, M. J., Popowics, T. St. Louis, MO: Elsevier/Saunders. 978-0323733564
- Dental Anatomy Coloring Book, Fehrenbach, M. J., St. Louis, MO: Elsevier. 978-0323812399
- Laptops are required to take quizzes, exams, and practicals. May be checked out at the library at no charge.

Course Content

General Learning Outcomes (GLOs)

- Communication: Students will demonstrate the ability to read, write, listen, and speak effectively.
- Critical Thinking and Information Literacy: Students will demonstrate the ability to evaluate perspectives, evidence, and implications, and to locate, assess, and use information effectively.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Overview of Dentition Part 1	1. Identify tooth types in permanent dentition. 2. Define and locate the surfaces of a tooth. 3. Identify and recognize the Universal Numbering System, International Numbering System, and Palmer Notation system. 4. State proper D-A-Q-T format. 5. State proper dental anatomy terminology.	1	2	0
Overview of Dentition Part 2	1. Identify tooth types in primary dentition. 2. Define the three dentition periods. 3. Define and locate the divisions of the crown and root of a tooth. 4. Identify the tissues and junctions of a tooth. 5. Define succedaneous and nonsuccedaneous teeth. 6. Differentiate between clinical crown and root and anatomical crown and root. 7. Define height of contour. 8. Define terms embrasure space, furcation, line angle, and point angle.	1	3	0
Oral Cavity and Pharynx	1. Define oral cavity proper and oral vestibule. 2. Define the boundaries of the oral cavity and oropharynx. 3. Describe the location of the mucobuccal fold. 4. Describe the alveolar process. 5. State the difference between the ventral surface and the dorsal surface of the tongue. 6. Name the four types of papilla found on the dorsal surface of the tongue. 7. Describe each of the four types of papilla found on the tongue. 8. Name the structures that lie under the sublingual folds and their use in evaluating the area during examination. 9. Differentiate between Bartholin's duct, Wharton's duct, and Stenson's duct. 10. Name the salivary glands and the names of their associated ducts. 11. Describe the sublingual folds (plica sublingualis) and fimbriated folds (plica fimbriata). 12. Relate the significance of the plica sublingualis to Bartholin's duct. 13. Describe the significance of the sublingual caruncle. 14. Explain why it is necessary to recognize normal oral anatomy.	2	5	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Oral Cavity and Pharynx (cont'd)	- Define the terms pathology and anomaly. - In lab, locate on a partner the oral and facial structures noted in this unit. - Define, describe, and possibly identify the following conditions: mucocoele, xerostomia, hyperkeratosis, linea alba, and ankyloglossia. - Define, describe, and possibly identify the following oral structures: oral cavity proper, oral pharynx, tonsillar pillars, palatoglossal fold, palatopharyngeal fold, fauces, lingual tonsils (follicles), pharyngeal adenoid tonsils, palatine tonsils, uvula. - Define, describe, and possibly identify concepts related to the hard palate: midpalatine raphe, palatine rugae, maxillary tuberosity, fovea palatine, incisive papilla, torus palatinus. - Define, describe, and possibly identify concepts related to the maxillary arch: retromolar pad, exostosis, zygomatic arch, parotid papilla, Stenson's duct, canine eminence, buccinator muscle. - Define, describe, and possibly identify structures ventral to the tongue: Wharton's duct, Bartholin's duct, plica fimbriata, lingual vein, sublingual fold, lingual frenum, sublingual caruncle, mylohyoid muscle. - Define, describe, and possibly identify structures dorsal to the tongue: median sulcus, filiform papilla, fungiform papilla, circumvallate papilla, foramen caecum, intrinsic and extrinsic muscle. - Define, describe, and possibly identify the following structures of the mandible: ramus of the mandible, mandibular tori, pterygomandibular raphe. - Define, describe, and possibly identify the following structures of the vestibule: buccal and labial vestibule, labial mucosa, mucobuccal fold, labial frenum, buccal frenum, buccal mucosa, fordyce granules (fordyce spots). - Define, describe, and possibly identify the following gingiva and demarcations of the gingiva: attached gingiva, marginal gingiva, free gingival groove, alveolar gingiva, gingiva, mucogingival junction, interdental papillae, gingival margin, stippled gingiva, alveolar mucosa. - Define, describe, and possibly identify the following facial structures: nasolabial groove, lips, vermillion zone, philtrum, tubercle of the maxillary lip, tragus, labial commissure, ala, medial canthus, labiomental groove, vermillion border, lateral canthus, lacrimal duct.			
Cells, Tissues, and Prenatal Development	- Discuss cell properties and components, including the cell membrane, cytoplasm, organelles, and inclusions. - Outline the cell cycle, describing the phases of mitosis that are involved. - Describe the extracellular materials surrounding the cell and its intercellular junctions. - Discuss basic tissue properties. - Describe epithelium properties, including its histology, classification, regeneration, turnover, and repair. - Describe basement membrane properties, including its histology. - Integrate the study of the histology of both epithelium and the basement membrane into the further study of dental histology. - Discuss connective tissue properties, including its histology, classification, turnover, regeneration, and repair. - Define embryological terms. - List and describe the three stages of prenatal development. - Define teratogens. - List and describe the five developmental processes of the embryo. - List the three embryonic germ layers and identify specific tissues that are derived from each layer. - Define neural crest cells and describe their role in the developing embryo. - List examples of developmental disturbances that can occur during embryonic period. - Describe tetracycline stain and identify the cause.	2	0	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Face and Neck Development and Orofacial Development	1. Describe how the embryo develops from a mass of cells to a tubular embryo. 2. Discuss the events that occur during the development of the orofacial structures. 3. Understand the formation of the palate and name what teeth are in which part. 4. Describe the fusion of the palate. 5. Identify what processes fail to fuse in cleft lip and cleft palate. 6. Review and reflect on a journal article pertaining to cleft lip and cleft palate. 7. List and describe all processes/branchial arches. 8. Describe the development of the tongue. 9. Describe why the tongue has so many innervations. 10. Describe macrostomia. 11. Describe and understand how the mouth is formed using the following vocabulary: Stomodeum, buccopharyngeal membrane, frontal process, brachial arches, maxillary process, mandibular arch, medial nasal process, lateral nasal process, globular process, lateral palatine processes, premaxilla, foramen caecum, thyroglossal duct, Rathke's pouch, and the philtrum. 12. View and reflect on documentary pertaining to cleft lip and palate.	2	0	0
Anterior Dentition	1. State the number of anterior teeth in the permanent dentition. 2. List the functions of incisors and canines. 3. List the eruption dates for each incisor and canine. 4. Describe the position of eruption of permanent incisors in relationship to deciduous teeth. 5. State the numbers of developmental lobes from which incisors and canines are formed. 6. State the tooth numbers of the permanent incisors and canines according to the Universal Numbering System. 7. State the tooth crown characteristics that distinguish incisors and canines from each other. 8. State the teeth on which lingual pits are frequently found. 9. Describe the location of the mesial and distal contact areas for maxillary and mandibular incisors and canines. 10. State the incisor that contacts only one tooth in the opposing arch. 11. State the number of roots found on maxillary and mandibular incisors and canines. 12. Describe the curvature, length, shape, and root depressions found on maxillary and mandibular incisors and canines. 13. In lab, identify and differentiate incisors using plastic prototypes and real tooth specimens. 14. Compare the tooth lengths of the canines to the lengths of all other teeth in the permanent dentition. 15. Describe the number of roots and shape of the pulp cavity for all permanent anterior teeth. 16. Name the canine that occasionally has two roots. 17. Name the two cusp ridges of the facial aspect of the canine. 18. Name the cusp slope that is shorter and slopes less markedly. 19. Identify the features of the lingual surface of the canine on a given diagram. 20. Define the lingual tubercle. 21. Name the canine that may have a lingual tubercle. 22. Describe the recommendations for maintaining healthy teeth and supporting structures. 23. List the self-protective features of the dentition. 24. Define tooth contours. 25. Describe how tooth contours contribute to healthy teeth and supporting structures. 26. Describe the effect of a tooth being under contoured and over contoured. 27. Define proximal contacts, or contact areas. 28. Describe how proximal contacts contribute to healthy teeth and supporting structures.	2	6	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Anterior Dentition (cont'd)	29. Describe the effects of improper tooth contact. 30. Define contact point. 31. Define embrasure. 32. Describe the purpose (function) of embrasures. 33. List the "names" of embrasures (named in relation to proximal contact). 34. Describe the problems of improper restorations regarding embrasures. 35. Describe the problems associated with overhanging restorations. 36. Describe the effect of open contact areas between two aligning teeth. 37. Identify eruption pattern of anterior teeth.			
Tooth Development	1. List and define terms associated with developing tooth tissues and dentition. 2. List and describe the stages of odontogenesis. 3. Identify and describe the three parts of the tooth germ. 4. Compare/contrast the cell layers during bell stage. 5. Illustrate the primary layers of the tooth, also labeling the crown and root. 6. Describe the clinical considerations due to developmental disturbances: anodontia, supernumerary teeth, microdontia, dens in dente, gemination, fusion, tubercle, enamel dysplasia, concrescence, enamel pearl. 7. Explain the outer enamel epithelium, inner enamel epithelium, stellate reticulum, stratum intermedium and their importance to tooth development. 8. Define these key terms: odontogenesis, cap stage, enamel organ, enamel knot, dental sac, tooth germ, dental lamina, succedaneous, nonsuccedaneous, outer enamel epithelium, inner enamel epithelium, stellate reticulum, stratum intermedium, outer cells of the dental papilla, central cells of the dental papilla, apposition stage, maturation stage, preameloblasts, dentinogenesis, predentin, ameloblasts, amelogenesis, enamel matrix, tomes process, odontoblastic process, dentinal tubule, dentinoenamel junction, cervical loop, Hertwig epithelial root sheath, epithelial rests of Malassez, cementogenesis, cementoblast, cementoid, dentinocemental junction, active and passive eruption, reduced enamel epithelium.	2	0	0
Enamel	1. Describe the properties of enamel. 2. Describe the process of amelogenesis. 3. Discuss the apposition and maturation of enamel. 4. Identify and define five types of hard tissue loss. 5. Integrate the knowledge of the histology with the clinical considerations involved with enamel. 6. Identify on a diagram and describe the following: dental lamina, enamel organ, bud, cap and bell stages, outer enamel epithelium, inner enamel epithelium, stellate reticulum, dental papilla, dental sac, ameloblasts, enamel rod, hypocalcified enamel, hypoplastic enamel, preameloblasts, hydroxyapatite crystal, imbrication line, lines of Retzius, perikymata, enamel spindle, enamel lamellae, Tomes process.	2	0	0
Dentin and Pulp	1. Describe the properties of dentin and pulp. 2. Label the anatomical components of pulp. 3. Describe the process of dentinogenesis. 4. Discuss the microscopic features of dentin and pulp. 5. Describe age-related changes in dentin and pulp. 6. Identify on a diagram and describe the following: odontoblasts, intertubular dentin, primary dentin, secondary dentin, reparative dentin, dead tracts, sclerotic dentin.	2	0	0
Posterior Permanent Dentition	1. State the number of premolars and molars found in the permanent dentition. 2. List the function of the premolars and molars. 3. State the eruption dates of the premolars and molars. 4. Describe the position of eruption of the premolars and molars in relationship to deciduous teeth. 5. State the numbers of developmental lobes from which premolars and molars are formed. 6. State the tooth numbers of the premolars and molars according to the Universal Numbering System. 7. State the characteristics of the tooth crown that distinguish premolars and molars from each other.	2	6	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Posterior Permanent Dentition (cont'd)	- Describe the location of the mesial and distal contact areas for the premolars and molars. - State the number of roots found on each premolar and molar. - Describe the morphology (curvature, length shape and root depressions) found on maxillary and mandibular premolars and molars. - In lab, identify and differentiate premolars and molars from other teeth using plastic prototypes and real tooth specimens. - State the size, in order, of the molars from largest to smallest. - Identify the cusp, cusp ridge, concavity, convexity, triangular ridge, transverse ridge, oblique ridge. - Name the two cusps that make up the oblique ridge (found on maxillary molars). - Name the cusp that is least developed on maxillary molars. - Describe the furcations found on maxillary and mandibular molar roots.			
Periodontium: Cementum, Alveolar Bone and PDL	- Discuss the periodontium and describe the properties of each of its tissues. - Compare/contrast types of cementum and alveolar bone. - Label the fiber groups of the periodontal ligament and discuss their functions. - Discuss the microscopic structures of the periodontium. - Describe age-related changes in the periodontium.	3	0	0
Oral Mucosa and Dentogingival Tissue	- List and describe the types of oral mucosa. - Classify the different types of epithelium associated with each type of oral mucosa. - Describe the lamina propria of the oral mucosa. - List and describe the clinical correlations associated with the regional differences in the oral mucosa. - Discuss turnover time for different tissues in the oral cavity and their clinical correlations. - List and describe each of the types of gingival tissues. - Describe the histological features of the different types of gingival tissues. - Describe the development and composition of the dentogingival junctional tissues. - Discuss turnover of the dentogingival junctional tissues. - Identify and discuss tongue and lingual papilla properties. - Identify mucosa pigmentation and its clinical considerations.	2	0	0
Occlusion	- Describe and recognize the normal arrangement of the teeth in the dental arch. - Describe and recognize the relationship of the mandibular dental arch to the maxillary dental arch. - Describe and recognize malocclusions (note molar relationship in Angle's Class I, Class II and Class III). - Compare the characteristics of Class I occlusion (normal) to Class I malocclusion. - List three reasons why it is important for the dental hygienist to examine a patient's occlusion. - Describe the meaning of vertical relation or vertical dimension of occlusion and of rest position. - Describe inter-occlusal distance of freeway space. - Understand when to use the terminology of mesial step, distal step, and flush terminal plane. - Describe horizontal relation including: centric relation, centric occlusion, protrusive occlusion, and lateral occlusion. - Define: working side, balancing side, intercuspal position or "habit bite", diastema, premature or deflective tooth contacts, prognathic, cross-bite, end-to-end bite, orthognathic, underjet/underbite, open bite, canine protected occlusion, equilibration, edge-to-edge bite, retrognathic, overjet, overbite, mesognathic, midline deviation, and tongue thrust. - In lab, identify malocclusions using study model.	3	6	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Temporomandibular Joint	1. List the articulating parts of the TMJ (temporomandibular joint). 2. Define the parts of the joint capsule. 3. List the two basic types of movement of the mandible. 4. Define lateral deviation of the mandible (lateral excursion). 5. Describe the problems associated with TMD (temporomandibular joint dysfunction). 6. Describe some of the causes and treatments of TMD. 7. Define and possibly locate: articular eminence, articular fossa, postglenoid process, compact bone, cancellous bone, mandibular condyle, hyaline cartilage, subluxation, masticate, crepitus, articular disk (joint disc), joint capsule, mandibular deviation (lateral deviation), condyle.	2	0	0
Primary Dentition	1. State the common synonym for the word primary when referring to primary teeth. 2. State the number of each tooth type in the primary dentition. 3. List important functions of the primary teeth. 4. State the eruption dates of the primary teeth. 5. State the tooth letters of the primary teeth according to the Universal system. 6. Define: exfoliation, resorption, deciduous, mixed dentition, primate spaces, and early childhood caries. 7. Compare permanent teeth with primary teeth. 8. Name the primary tooth that is least like any other tooth in either the permanent or primary dentition. 9. List the teeth that begin the mixed dentition stage of eruption. 10. Describe the terms terminal step and terminal plane. 11. In lab, compare the primary teeth to the corresponding permanent dentition and identify primary teeth in mixed dentition.	2	2	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
30	30	0