



# ILLINOIS VALLEY COMMUNITY COLLEGE

## COURSE OUTLINE

**DIVISION:** Health Professions

**COURSE:** DLH 1202 Advanced Orofacial Anatomy

Date: Fall 2023

Credit Hours: 3

*Complete all that apply or mark "None" where appropriate:*

Prerequisite(s): Acceptance into the Dental Hygiene AAS Degree Program

Enrollment by assessment or other measure?  Yes  No

If yes, please describe:

Corequisite(s): None

Pre- or Corequisite(s): None

Consent of Instructor:  Yes  No

Delivery Method:	<input checked="" type="checkbox"/> <b>Lecture</b>	<b>3 Contact Hours</b> (1 contact = 1 credit hour)
	<input type="checkbox"/> <b>Seminar</b>	<b>0 Contact Hours</b> (1 contact = 1 credit hour)
	<input type="checkbox"/> <b>Lab</b>	<b>0 Contact Hours</b> (2-3 contact = 1 credit hour)
	<input type="checkbox"/> <b>Clinical</b>	<b>0 Contact Hours</b> (3 contact = 1 credit hour)

Offered:  **Fall**    **Spring**    **Summer**

### **CATALOG DESCRIPTION and IAI NUMBER (if applicable):**

This course is an in-depth review and expansion of concepts covered in DLA 1200, DLA 1210, and DLA 2230. This course covers content such as tooth development and identification, oral histology and embryology of the oral cavity and related tissues, and the study of head and neck anatomy. Information detailed throughout includes osteology of the skull; muscles, nerves, and arteries of the head and neck; salivary glands; distribution patterns of the lymphatic/immune systems relating to the spread of infection related to dentistry; and the anatomy, function/dysfunction, and clinical considerations of the temporomandibular joint.

## **ACCREDITATION STATEMENTS AND COURSE NOTES:**

2-8 The curriculum must include content in the following four areas: general education, biomedical sciences, dental sciences and dental hygiene science. This content must be integrated and of sufficient depth, scope, sequence of instruction, quality and emp

## **COURSE TOPICS AND CONTENT REQUIREMENTS:**

- I. Incisors
  - A. Maxillary Permanent incisors
    - a. Central incisors
    - b. Lateral incisors
  - B. Mandibular Permanent incisors
    - a. Central incisors
    - b. Lateral incisors
- II. Canines
  - A. Maxillary and Mandibular Permanent Canines
- III. Premolars
  - A. Maxillary Premolars
    - a. First premolars
    - b. Second premolars
  - B. Mandibular premolars
    - a. First premolars
    - b. Second premolars
- IV. Molars
  - A. Maxillary Molars
    - a. First Molars
    - b. Second Molars
    - c. Third Molars
  - B. Mandibular molars
    - a. First molars
    - b. Second molars
    - c. Third molars
- V. Deciduous dentition
  - A. Essential differences between deciduous and permanent teeth
  - B. Importance of deciduous teeth
    - a. Maxillary central incisors
    - b. Maxillary lateral incisors
    - c. Mandibular central incisors
    - d. Mandibular lateral incisors
    - e. Maxillary canines
    - f. Mandibular canines
    - g. Maxillary first molars
    - h. Maxillary second molars
    - i. Mandibular first molars
    - j. Mandibular second molars
- VI. Basic Tissues
  - A. Cell structure
  - B. Epithelial tissue
    - a. Glands

- C. Connective tissue
  - a. Cartilage
  - b. Bone
  - c. Blood
- D. Muscle tissue
  - a. Skeletal
  - b. Cardiac
  - c. Smooth
- E. Nervous tissue
- VII. Development of the orofacial complex
  - A. Prefacial embryology
  - B. Facial development
  - C. Palatal development
    - a. Cleft lips and palates
  - D. Other structural development inside the pharyngeal arches
- VIII. Dental Lamina and Enamel Organ
  - A. Dental Lamina
  - B. Enamel Organ
    - a. Bud stage
    - b. Cap stage
    - c. Bell stage
  - C. Successional lamina
  - D. Vestibular lamina
  - E. Dental papilla and dental sac
- IX. Enamel, Dentin, and Pulp
  - A. Dental papilla
  - B. Enamel composition
  - C. Development of enamel
  - D. Fate of enamel organ
  - E. Abnormalities of enamel
  - F. Dentin composition
  - G. Formation of regular dentin
  - H. Formation of secondary and reparative dentin
    - a. Abnormalities in dentin
  - I. Pulp
    - a. Abnormalities in pulp
- X. Root formation and attachment apparatus
  - A. Root formation
  - B. Attachment apparatus
    - a. DEJ
    - b. Cementum
    - c. Alveolar Bone
    - d. Periodontal Ligament
  - C. Bone Remodeling
- XI. Eruption and Shedding of teeth
  - A. Active tooth eruption
    - a. Preeruptive stage
    - b. Eruptive stage

- c. Posteruptive stage
- B. Causes of eruption
- C. Shedding of primary dentition
- D. Retained primary teeth
- XII. Oral mucous membrane
  - A. Divisions of mucous membrane
  - B. Masticatory mucosa
  - C. Lining Mucosa
  - D. Submucosa
  - E. Passive eruption
  - F. Changes in oral mucosa
- XIII. The tongue
  - A. Development of the tongue
  - B. Tongue muscles
  - C. Papillae
    - a. Circumvallate
    - b. Fungiform
    - c. Filiform
- XIV. Histology of the salivary glands
  - A. Components of a salivary gland
  - B. Control of secretions
  - C. Formation of saliva
  - D. Function of saliva
- XV. Osteology of the Skull
  - A. Views of the skull
    - a. Anterior view of the skull
    - b. Lateral view of the skull
    - c. Inferior view of the skull
      - i. The floor of the cranial cavity
    - d. Posterior view of the skull
  - B. Major bones of the skull
- XVI. Nose, Nasal cavity, and paranasal sinuses
  - A. Nose and nasal cavity
  - B. Paranasal sinuses
  - C. Functions of sinuses
  - D. Clinical problems
- XVII. Muscles of mastication, hyoid muscles, and sternocleidomastoid and trapezius muscles
  - A. Muscles of mastication
    - a. Masseter
    - b. Temporal
    - c. Medial Pterygoid
    - d. Lateral pterygoid
  - B. Hyoid muscles
    - a. Suprahyoid group
    - b. Infrahyoid group
  - C. Movements of the jaw and larynx
  - D. Sternocleidomastoid muscle

- E. Trapezius muscle
- XVIII. Temporomandibular Joint
  - A. Structure
  - B. Movement
  - C. Problems associated with the TMJ
    - a. Pain in the TMJ area
    - b. Internal Problems of the TMJ
- XIX. Muscles of Facial Expression
  - A. Ears
    - a. Anterior Auricular Muscle
    - b. Superior Auricular Muscle
    - c. Posterior Auricular Muscle
  - B. Scalp
    - a. Occipitofrontalis
  - C. Neck
    - a. Platysma
  - D. Eyes
    - a. Orbicularis Oculi
    - b. Corrugator
    - c. Procerus
  - E. Nose
    - a. Dilator Naris
    - b. Compressor Naris
  - F. Mouth
    - a. Orbicularis oris
    - b. Levator labii superioris
    - c. Zygomaticus minor
    - d. Zygomaticus major
    - e. Levator anguli oris
    - f. Depressor labii inferioris
    - g. Depressor anguli oris
    - h. Mentalis
    - i. Buccinator
    - j. Risorius
- XX. Soft palate and pharynx
  - A. Soft palate
  - B. Pharynx
  - C. Actions
    - a. Speech
    - b. Swallowing
- XXI. Arterial supply and venous drainage
  - A. Arterial supply
    - a. Common carotid artery
  - B. Venous Drainage
    - a. Jugular Veins
- XXII. Salivary Glands
  - A. Major Salivary Glands
    - a. Parotid

- b. Submandibular
    - c. Sublingual
  - B. Minor salivary glands
    - a. Labial
    - b. Buccal
    - c. Palatine
    - d. Glossopalatine
    - e. Lingual
  - C. Development of salivary ducts
  - D. Innervation of salivary glands
- XXIII. Nervous System
  - A. Central nervous system
  - B. Peripheral nervous system
  - C. Autonomic nervous system
  - D. Nerves to the oral cavity and associated structures
    - a. Trigeminal Nerve
    - b. Facial Nerve
    - c. Glossopharyngeal Nerve
    - d. Vagus Nerve
- XXIV. Lymphatics and Spread of Dental Infection
  - A. Lymphatic system
  - B. Node groups affected by disease
  - C. Spread of infection in fascial spaces
  - D. Other maxillary infections

**INSTRUCTIONAL METHODS:**

- Lecture
- Slide presentations
- Class discussion
- Visual aids - videos, models, slides
- Game-based online learning platforms
- Exams and quizzes
- Learning Management System

**EVALUATION OF STUDENT ACHIEVEMENT:**

- Examinations and homework will be used to evaluate student progress.
- Various projects will be assigned throughout the semester and must be completed with a 'C' or higher in order to successfully complete the course.
- A grade of "C" is required for graduation from the Dental Hygiene Program. The following grading scale will be used as a guide in determining the final grade for this course:

A= 92-100  
 B= 83-91  
 C= 75-82  
 D= 68-74  
 F= 67 and below

## **INSTRUCTIONAL MATERIALS:**

### **Textbooks**

*Anatomy of Orofacial Structures: A Comprehensive Approach Elsevier, Brand and Isselhard, 8<sup>th</sup> Edition*

*Illustrated Dental Embryology, Histology, and Anatomy Elsevier, 5th Edition by Margaret J. Fehrenbach, RDH, MS and Tracy Popowics, PhD*

### **Resources**

- Models and Charts
- Evolve Resources

## **LEARNING OUTCOMES AND GOALS:**

### **Institutional Learning Outcomes**

- 1) Communication – to communicate effectively;
- 2) Inquiry – to apply critical, logical, creative, aesthetic, or quantitative analytical reasoning to formulate a judgement or conclusion;
- 3) Social Consciousness – to understand what it means to be a socially conscious person, locally and globally;
- 4) Responsibility – to recognize how personal choices affect self and society.

### **Course Outcomes and Competencies**

1. Demonstrate an advanced understanding of particular anatomic features associated with permanent teeth
  - 1.1. Students will identify the particular anatomic features of incisors, canines, premolars, and molars.
  - 1.2. Recognize the normal and deviated anatomic forms of incisors.
  - 1.3. Compare maxillary central incisors with their mandibular counterparts
  - 1.4. Compare maxillary and mandibular canines
  - 1.5. Describe the major differences and similarities between mandibular first and second premolars
  - 1.6. Identify the major differences and similarities between maxillary first and second premolars
  - 1.7. Compare the various molars.
  - 1.8. Identify the calcification and root completion schedules in relation to the eruption dates of canines
  - 1.9. Describe the various occlusal forms possible for a mandibular second molar
  - 1.10. Describe lobe formations of the crowns of molars
  - 1.11. Identify the anchorage of the roots of molars as resistance to forces of displacement
  - 1.12. Identify an extracted tooth of each type
2. Demonstrate an advanced understanding of particular anatomic features associated with the deciduous dentition.
  - 2.1. Identify various deciduous teeth
  - 2.2. Identify eruption dates of primary and secondary teeth
  - 2.3. Describe the importance and function of primary teeth
  - 2.4. Compare the anatomical features of deciduous teeth with other deciduous teeth and with their permanent counterparts.

3. Demonstrate a basic understanding of the fundamental concepts and structure of the body's tissues.
  - 3.1. Describe a cell and the function of its components
  - 3.2. Define the function of epithelium and name the various types and their locations
  - 3.3. Describe the origin of glands and the ways in which they may be classified.
  - 3.4. Describe the component, function, and location of general connective tissues
  - 3.5. Describe the structure of bone and the two ways in which it is formed
  - 3.6. Briefly describe the components and origin of blood cells, their functions, and normal numbers
  - 3.7. Identify the three types of muscles and their functions, shapes, and locations
  - 3.8. Describe the neuron, its parts, and function.
4. Demonstrate a comprehensive understanding of the developmental stages of the human from fertilization to birth
  - 4.1. List the embryonic structures that form the face and discuss the approximate age of formation
  - 4.2. Identify the mechanism involved in the development of the maxillary lip
  - 4.3. Name the structures involved in the formation of the palate and the timing of its development
  - 4.4. Describe the other structures arising from the pharyngeal arches
  - 4.5. Identify the embryonic structures involved in the development of the cleft lip and palate
  - 4.6. Define the dental lamina and indicate in what embryonic week it is first seen
  - 4.7. Describe the bud, cap, and bell stages and the various layers found in each
  - 4.8. Define successional and vestibular laminae
  - 4.9. Describe the dental papilla, the dental sac, and their functions
  - 4.10. Describe the changes in the cells of the inner enamel epithelium allowing them to become enamel forming cells
  - 4.11. Identify the interrelationship between enamel and dentin formation
  - 4.12. Describe the properties of enamel and the make up of the enamel rod
  - 4.13. Describe the properties and components of dentin
  - 4.14. Describe the components and age-related changes of the pulp
5. Demonstrate an advanced understanding of root formation and the development of the attachment apparatus.
  - 5.1. Describe the role of the epithelial root sheath in root formation and dentin formation
  - 5.2. Describe the fate of the epithelial root sheath
  - 5.3. Describe the beginning of cementum formation, the two varieties, and where they are found
  - 5.4. Define and diagram alveolar bone and its components
  - 5.5. Define periodontal ligament and list its various groups and subgroups of fibers'
  - 5.6. Describe bone's reaction to pressure and tension and how this affects tooth movement
6. Demonstrate a comprehensive understanding of the eruption and shedding of teeth
  - 6.1. Name the three stages of active tooth eruption and the points at which each stage begins
  - 6.2. Discuss the fate of the epithelial layers covering the crown of the tooth
  - 6.3. Name some of the forces in tooth eruption and which ones most likely have the greatest influence
  - 6.4. Identify what causes the shedding of primary teeth
  - 6.5. Diagram and describe the origin and position of permanent teeth compared with deciduous teeth



- 6.6. List and describe the factors that lead to a retained primary tooth
7. Demonstrate a comprehensive understanding of the osteology of the skull
  - 7.1. Name the bones of the neurocranium and viscerocranium
  - 7.2. Identify the various bones and sutures as seen from the anterior, lateral, posterior, inferior, and interior views of the skull
  - 7.3. Name the openings, foramina, and canals as seen from the aforementioned views
  - 7.4. Describe the boundaries of the three cranial fossae and what lies within them
  - 7.5. Describe the pterygoid processes of the sphenoid bone and their components
  - 7.6. Describe in detail the various parts and landmarks of the maxillae
  - 7.7. Describe in detail the various parts and landmarks of the mandible
  - 7.8. Describe where growth takes place in the maxillae and the mandible to allow for an increase in arch length
8. Demonstrate a comprehensive understanding of the anatomy and function of the nose, nasal cavity, and paranasal sinuses
  - 8.1. Discuss the anatomic relationship between maxillary sinuses and maxillary teeth
  - 8.2. Describe the relationship between the maxillary teeth and the maxillary sinus in infections of either one
9. Demonstrate a comprehensive understanding of the anatomy and function of the muscles of mastication, hyoid muscles, and sternocleidomastoid and trapezius muscles
  - 9.1. Describe the origin, insertion, action, and nerve and blood supply of the muscles of mastication
  - 9.2. Categorize the muscles according to their roles in elevation, depression, protrusion, retrusion, and later excursion of the mandible.
  - 9.3. Name the suprahyoid and infrahyoid muscles and their roles in mandibular movements, swallowing, and phonation
10. Demonstrate a comprehensive understanding of the temporomandibular joint structure and function
  - 10.1. Diagram and label a sagittal section of the temporomandibular joint
  - 10.2. Define the role of a synovial cavity
  - 10.3. Describe the two movements of the TMJ as the mouth opens and know where these movements take place
  - 10.4. Describe the role of the superior posterior elastic lamina, the inferior posterior collagenous lamina, and the superior and inferior heads of the lateral pterygoid muscle as the jaw goes through its various functional movements.
  - 10.5. Define disc derangement, subluxation, bruxism, and TMJ sounds
  - 10.6. Identify the probable causes of TMJ pains
11. Demonstrate a basic understanding anatomy and function of the muscles of facial expression
  - 11.1. Name the various groupings or locations of the muscles of facial expression and their nerve innervations
  - 11.2. Describe the muscle of facial expression and their origins, insertions, and actions
  - 11.3. Name all the muscles surrounding the mouth and their origins, insertions, and actions
  - 11.4. Discuss the role of the buccinator muscle in mastication
12. Demonstrate a basic understanding of the arterial supply and venous drainage
  - 12.1. Trace blood from the time it returns from the vena cava to the heart, out, and back until it returns again from the entire body
  - 12.2. Trace blood supply from the heart to all areas of the oral cavity, including teeth
  - 12.3. Trace venous drainage from teeth and oral cavity back to the heart

- 12.4. Define hematoma
- 12.5. Discuss the possible problems associated with a posterior superior alveolar injection
- 13. Demonstrate a comprehensive understanding of the name, location, and type of secretion of the salivary glands
  - 13.1. Describe the differences between the major and minor salivary glands
  - 13.2. Name and locate each of the major and minor glands
  - 13.3. Classify each of the glands according to its type and secretion
  - 13.4. Describe the functions of saliva
  - 13.5. Describe the development of the ducts and the ductless glands
- 14. Demonstrate a basic understanding of the nervous system
  - 14.1. Name the basic components of the nervous system
  - 14.2. Describe the general makeup of a spinal nerve
  - 14.3. Describe how a sensory impulse causes a motor response
  - 14.4. Name the 12 cranial nerves and their general function
  - 14.5. Describe the components and general function of the autonomic nervous system
  - 14.6. Name the specific branches of the trigeminal nerve and which areas of the face, teeth, and oral cavity each branch supplies
  - 14.7. Describe the nerves and areas involved in general and special sensation of the tongue
  - 14.8. Identify the nerves and pathways involved in parasympathetic innervation to major salivary glands
- 15. Demonstrate a basic understanding of lymphatics and the spread of dental infection
  - 15.1. Describe the function of the lymphatic system
  - 15.2. Diagram and label the major groups of lymph nodes that drain teeth and the oral cavity
  - 15.3. Name the primary lymph drainage of all teeth
  - 15.4. Describe the concept of fascial space infection
  - 15.5. Define Ludwig's angina