



ILLINOIS VALLEY COMMUNITY COLLEGE

COURSE OUTLINE

DIVISION: Health Professions

COURSE: DLA 2230 Oral Embryology and Histology

Date: Fall 2023

Credit Hours: 1

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

Prerequisite(s): DLA 1210

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

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

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

CATALOG DESCRIPTION and IAI NUMBER (if applicable):

This course studies oral embryologic development and microscopic orofacial organs and structures.

ACCREDITATION STATEMENTS AND COURSE NOTES:

This course fulfills the requirements set forth by the Commission on Dental Accreditation regarding content depth, breadth and scope of the topics of oral embryology and histology.

2-8c

Dental sciences content must include tooth morphology, head, neck and oral anatomy, oral embryology and histology, oral pathology, radiography, periodontology, pain management, and dental materials.

Intent:

These subjects provide the student with knowledge of oral health and disease as a basis for assuming responsibility for assessing, planning and implementing preventive and therapeutic services. Teaching methodologies should be utilized to assure that the student can assume responsibility for the assimilation of knowledge requiring judgment, decision making skills and critical analysis.

COURSE TOPICS AND CONTENT REQUIREMENTS:

1. Prenatal Development
 - a. Preimplantation period
 - b. Embryonic Period

2. Face and Neck Development
 - a. Stomodeum and Oral Cavity Formation
 - b. Mandibular Arch and Lower Face Formation
 - c. Frontonasal process and upper face formation
 - i. Placode development
 - ii. Nose and paranasal sinus development
 - d. Maxillary process and midface formation
 - e. Upper and lower lip formation
 - f. Primitive pharynx formation
 - g. Apparatus formation

3. Orofacial Development
 - a. Primary palate formation
 - b. Secondary palate formation
 - c. Palate completion
 - d. Body of the tongue formation
 - e. Base of the tongue formation
 - f. Completion of tongue formation

4. Cells
 - a. Cell anatomy
 - b. Cell division
 - c. Extra cellular materials
 - d. Intercellular junctions

5. Basic Tissue
 - a. Epithelium properties
 - b. Epithelium histology

- c. Epithelium classification
 - d. Epithelium regeneration, turnover and repair
 - e. Basement membrane histology
 - f. Connective tissue histology
 - g. Connective tissue classification
 - h. Connective tissue repair
 - i. Connective tissue proper turnover, regeneration and repair
 - j. Specialized connective tissue properties
 - k. Cartilage properties
 - l. Bone properties
 - m. Blood properties
 - n. Muscle classification
 - o. Skeletal muscle histology
 - p. Nerve tissue histology
 - q. Nervous system
6. Gingival and Dentogingival Junctional Tissue
 - a. Gingival tissue anatomy
 - b. Gingival tissue histology
 - c. Dentinogingival junctional tissue histology
 - d. Dentinogingival junctional tissue development
 - e. Dentinogingival junctional tissue turnover
7. Enamel
 - a. Development
 - b. Matrix formation
 - c. Matrix maturation
 - d. Histology
8. Dentin and Pulp
 - a. Dentin-pulp complex
 - b. Dentin properties
 - c. Dentin matrix formation
 - d. Dentin matrix maturation
 - e. Mature dentin components
 - f. Dentin Types
9. Periodontium
 - a. Cementum
 - b. Alveolar process
 - c. Periodontal ligament

INSTRUCTIONAL METHODS:

- Lecture
- Power Points
- Class discussion
- Demonstration
- Visual aids - videos, models, slides
- Exams and quizzes

- Problem solving exercises

EVALUATION OF STUDENT ACHIEVEMENT:

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 in this course.

A= 89.5-100
B= 79.5-89.4
C= 69.5-79.4
D= 59.5-69.4
F= 0-59.4

INSTRUCTIONAL MATERIALS:

Textbooks

Illustrated Dental Embryology, Histology, and Anatomy, 5th Edition, Fehrenbach & Popowics, 2020
Workbook for Illustrated Dental Embryology, Histology, and Anatomy, 5th Edition, Fehrenbach

Resources

1. Evolve Elsevier Online Resources: <http://evolve.elsevier.com/Ferenbach/illustrated>
 - a. Practice Quizzes
 - b. Histology Matching Game
 - c. Review and Assessment Questions
 - d. Tooth Identification Exercises
2. Dental Anatomy Coloring Book
3. Dentalcare.com

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. Prenatal Development

- 1.1. The student will be able to outline the preimplantation period, including the major events that occur during this first week of prenatal development
- 1.2. The student will be able to integrate a study of the preimplantation period of prenatal development into the development of the orofacial structures and the clinical considerations due to developmental disturbances associated with these structures.

- 1.3. The student will be able to outline the second week of prenatal development during the embryonic period, including the major events that occur.
- 1.4. The student will be able to outline the third week of prenatal development during the embryonic period, including the major events that occur.
- 1.5. The student will be able to outline the fourth week of prenatal development during the embryonic period, including the major events that occur.
- 1.6. The student will be able to integrate the study of the embryonic period of prenatal development into orofacial development and the clinical considerations due to developmental disturbances associated with these structures.
- 1.7. The student will be able to outline the fetal period of prenatal development, including the major events that occur after the fourth week until birth within this period.
- 1.8. The student will be able to identify the structures present during prenatal development on a diagram.
- 1.9. The student will be able to integrate the study of the fetal period of prenatal development into orofacial development and the clinical considerations due to developmental disturbances associated with these structures.

2. Face and Neck Development

- 2.1. Define and pronounce the key terms in this chapter.
- 2.2. Outline the events that occur during facial development, describing each step in its formation.
- 2.3. Identify the structures present during facial development on a diagram.
- 2.4. Integrate the study of the facial development into understanding the observed orofacial structures and the clinical considerations due to developmental disturbances of these structures.
- 2.5. Outline the events that occur during neck development, describing each step in its formation.
- 2.6. Identify the structures present during neck development on a diagram.
- 2.7. Integrate the study of neck development into understanding the observed orofacial structures and the clinical considerations due to developmental disturbances of these structures.

3. Orofacial Development

- 3.1. Define and pronounce the key terms in this chapter.
- 3.2. Outline the events that occur during palatal development, describing each step of its formation.
- 3.3. Integrate the study of palatal development into understanding the present structure and the clinical considerations due to developmental disturbances involved in palatal development.
- 3.4. Identify the structures present during palatal development on a diagram.
- 3.5. Outline the events that occur during nasal cavity and nasal septum development.
- 3.6. Integrate the study of nasal cavity and nasal septum development into understanding the present structure.
- 3.7. Identify the structures present during nasal cavity and nasal septum development on a diagram.

- 3.8. Outline the events that occur during the tongue development, describing each step of its formation.
- 3.9. Integrate the study of tongue development into understanding the present structure and the clinical considerations due to developmental disturbances involved in tongue development.
- 3.10. Identify the structures present during tongue development on a diagram.

4. Cells

- 4.1. Define and pronounce the key terms in this chapter.
- 4.2. Discuss cell properties and components, including the cell membrane, cytoplasm, organelles, and inclusions.
- 4.3. Identify the components of the cell on a diagram.
- 4.4. Outline the cell cycle, describing the phases of mitosis that are involved.
- 4.5. Describe the extracellular materials surrounding the cell and its intercellular junctions.
- 4.6. Integrate the study of cell anatomy into the further study of dental histology.

5. Epithelium, Basic Membrane, and Connective Tissues

- 5.1. Define and pronounce the key terms in this chapter.
- 5.2. Discuss basic tissue properties.
- 5.3. Describe epithelium properties, including its histology, classification, regeneration, and repair.
- 5.4. Describe basement membrane properties, including its histology.
- 5.5. Integrate the study of the histology of both epithelium and the basement membrane into the further study of dental histology.
- 5.6. Discuss connective tissue properties, including its histology, classification, turnover, and repair.

6. Cartilage, Bone, Blood, Muscles, and Nerve Tissues

- 6.1. Describe specialized connective tissue properties.
- 6.2. Describe cartilage properties, histology, development, repair, and aging.
- 6.3. Describe bone properties, histology, development, remodeling, repair, and aging.
- 6.4. Describe blood properties, plasma, and blood components.
- 6.5. Integrate the study of the basic histology of connective tissue into understanding the clinical considerations of the orofacial region.
- 6.6. Describe muscle properties, classifications, and histology.
- 6.7. Describe nerve tissue properties and histology as well as the nervous system divisions.
- 6.8. Identify the components of each basic tissue on a diagram.
- 6.9. Integrate the study of the histology of both muscle and nerve tissue into the further study of dental histology.

7. Oral Mucosa Types and Components

- 7.1. Define and pronounce the key terms in this chapter.
- 7.2. List and describe the types of oral mucosa, characterizing each type of epithelium associated with the oral cavity.
- 7.3. Discuss the clinical considerations for oral mucosa pathology, integrating it into patient care.
- 7.4. Identify the components of each type of oral mucosa on a diagram.

- 7.5. List and discuss the clinical correlations associated with the regional differences in the oral mucosa, integrating it into patient care.
- 7.6. Discuss tongue and lingual papillae properties as well as oral mucosa pigmentation and the clinical considerations for both.
- 7.7. Discuss the turnover times for regions of the oral cavity and associated clinical correlations as well as repair and aging considerations, integrating it into patient care.

8. Gingival and Dentogingival Junctional Tissue

- 8.1. Define and pronounce the key terms in this chapter.
- 8.2. List and describe each type of gingival tissue.
- 8.3. Describe the histologic features of each type of gingival tissue and the clinical considerations for gingival tissue esthetics, integrating it into patient care.
- 8.4. Identify the components of each type of gingival tissue on a diagram.
- 8.5. Describe dentogingival junctional properties, histology, and development.
- 8.6. Identify the structure of the dentogingival junctional tissue on a diagram.
- 8.7. Discuss the clinical considerations for gingival tissue pathology, integrating it into patient care.
- 8.8. Discuss turnover of the dentogingival junctional tissue and its clinical implications.

9. Enamel

- 9.1. Define and pronounce the key terms in this chapter.
- 9.2. Describe the enamel properties and the clinical considerations concerned with enamel structure, integrating it into patient care.
- 9.3. Discuss the processes involved in the apposition and maturation stages of enamel as well as the clinical considerations concerned with enamel formation and pathology, integrating it into patient care.
- 9.4. Identify the components of the enamel on a diagram.
- 9.5. Discuss the histology of enamel and the clinical considerations for dental procedures concerning enamel, integrating it into patient care.

10. Dentin and Pulp

- 10.1. Define and pronounce the key terms in this chapter.
- 10.2. Discuss the dentin-pulp complex.
- 10.3. Describe the properties of dentin and the clinical consideration for dentin structure, integrating it into patient care.
- 10.4. Describe the processes involved in the stages of apposition and the maturation of dentin.
- 10.5. Outline the types of dentin and discuss the clinical considerations for dentin pathology, integrating it into patient care.
- 10.6. Discuss the histology of dentin.
- 10.7. Describe pulp properties, including its anatomic components.
- 10.8. Identify the components of both the dentin and the pulp on a diagram.
- 10.9. Discuss the histology of pulp and the clinical considerations for pulp pathology and repair, integrating it into patient care.

11. Cementum Properties and Development

- 11.1. Define and pronounce the key terms in this chapter.
- 11.2. Give an overview of periodontium properties, including its components.

- 11.3. Identify each individual component of the periodontium on a diagram.
- 11.4. Discuss cementum properties and the clinical considerations with cementum structure, integrating it into patient care.
- 11.5. Discuss cementum development, histology, types, and repair as well as the clinical considerations for cementum pathology, integrating it into patient care.

12. The Alveolar Process

- 12.1. Discuss alveolar process properties, including jaw anatomy and histology.
- 12.2. Discuss the clinical considerations with the alveolar process, integrating it into patient care.

13. Periodontal Ligament

- 13.1. Describe periodontal ligament properties.
- 13.2. Identify the fiber groups of the periodontal ligament on a diagram and discuss the functions assigned to each of them.
- 13.3. Discuss the clinical considerations for periodontal ligament pathology and repair, integrating it into patient care.