

## **SYLLABUS**

COURSE: DHBS 3109 Dental Anatomy  
SEMESTER: Fall  
CREDIT HOURS: 2.0

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COURSE DIRECTOR: Jay Ferguson, D.D.S.

## GOAL

Knowledge of dental anatomy is fundamental in the study and practice of dental hygiene. It is essential in diagnosis, treatment planning and treatment. This knowledge will serve as a foundation in your education as a dental hygienist. The continuing application of this knowledge will help you provide excellent care for your patients and help insure your success as a dental hygienist.

In the didactic component of this course, the study of dental anatomy provides the student knowledge in the anatomical and morphological characteristics of the teeth and their supporting structures. This study includes inter-arch and intra-arch relationships, the morphology of the crown, root, and pulp, development, tooth microstructure, eruption, and occlusion.

In the laboratory component of this course, the student will learn to apply dental terminology and to identify each of the permanent teeth with the appropriate Universal number.

In the Bachelor of Science component of this course, the student will complete a project designed to foster a higher level of thinking. It is also anticipated that this project will help develop a broader foundation and deeper appreciation in the areas of education, service, dental hygiene and/or dentistry.

## OBJECTIVES

### I. Introduction to Terminology

1. Given an illustration of an anatomic structure or space, name it with an appropriate term.
2. State the dental formula for the primary dentition and the permanent dentition.

### II. The Tooth: Function and Terms

1. Identify the different tissues that compose the teeth.
2. Differentiate between anatomic and clinical eruption.
3. Define single, bifurcated and trifurcated roots.
4. Describe how the function teeth relate to their shape and size.
5. Describe the individual function and differences that exist among incisors, canines, premolars and molars.
6. Name and identify the location of the various tooth surfaces.
7. Name and identify the line angles of the teeth.
8. Name and identify the point angles of the teeth
9. Define the terminology used in naming the landmarks of the teeth.

### III. Fundamental and Preventive Curvatures

1. Describe the importance of shape of teeth in regard to preservation of the dentition.
2. Identify the proximal contact area.
3. Identify contact (occlusal) points.
4. List the four functions of embrasures.
5. Describe the axial inclination of the individual permanent teeth.
6. Describe the faciolingual and incisocervical position of proximal contact between anterior teeth.
7. Describe the faciolingual and occlusocervical position of proximal contact between posterior teeth.
8. Name two events which proximal contact between posterior teeth in normal alignment aid in preventing.
9. Name the anatomic structure found on a posterior tooth that contributes to the formation of the gingival embrasure.

10. Define facio-lingual taper.
11. Name the two permanent teeth that may exhibit reverse facio-lingual taper.
12. Explain the three roles of facio-lingual taper.
13. Define the following terms:
  - a. Curve of Spee
  - b. Curve of Wilson
  - c. Compensating occlusal curvature
  - d. Axial position
14. Describe how the curve of Spee and curve of Wilson may effect the crown and root inclination for the molar teeth.
15. List the five general rules of cervical line curvature.

IV. Dentition (Text, Chapter 23)

1. Name the three dentition periods.
2. Define succedaneous teeth.
3. State the normal number of teeth for the primary and permanent dentitions.
4. Describe the arrangement of teeth into dentitions, arches and quadrants.
5. For an individual primary or permanent tooth, use the universal system to identify it.

V. Anterior Tooth Identification

1. Given a selection of extracted permanent anterior teeth, identify each tooth with the correct universal number.

VI. Incisors

1. Identify the particular anatomical features of incisor teeth.
2. Describe the difference between the maxillary central and maxillary lateral incisors.
3. Describe the difference between the maxillary incisors and mandibular incisors.
4. Describe the difference between the mandibular central incisors and the mandibular lateral incisors.
5. Describe the normal and deviated anatomical forms of incisor teeth.
6. Define the following terms:
  - a. overbite
  - b. overjet
  - c. group function
  - d. cuspid rise

7. Describe the following phonetic positions:
  - a. "F" sound
  - b. "S" sound
  - c. "L" sound
8. Describe the following morphological relationships:
  - a. dentinogenic theory
  - b. square, tapering, ovoid theory
  - c. shade of teeth
  - d. smile line
9. List five ways that esthetics can be altered either favorably or unfavorably.
10. Describe four oral habits that can effect the form.

VII. Canines

1. Describe the function of the canine in relation to its shape.
2. Describe the calcification and root completion schedule in relation to the eruption dates of the canines.
3. Describe the ways that the canines resemble the anterior teeth.
4. Describe how the canines are different from the other anterior teeth and how they are similar to some posterior teeth.
5. Identify the anatomical structures and landmarks of the canine teeth.
6. Compare the maxillary canines to the mandible canines.

VIII. Premolars

1. Recognize and name the pertinent anatomical structures of each premolar - cusps, ridges, developmental grooves, triangular grooves, pits and developmental premolars.
2. Compare the anatomy of the maxillary and mandibular premolars.
3. Describe the major differences and similarities between the maxillary first and second premolars.
4. Describe the various occlusal forms possible for a mandibular second premolar.
5. Compare the mandibular first premolars with the mandibular second premolars (development, shape and diversities of anatomical form)
6. Describe how development occurs through the formation and fusion of lobes in the premolars.
7. Describe how the form of a premolar relates to its ultimate function.

IX. Posterior Tooth Identification

1. Given a set of extracted permanent posterior teeth, identify each with the correct universal number.

X. Molars

1. Describe the lobe formation of the molars.
2. Describe the formations of the first, second and third molars.
3. Describe the anchorage of the roots as a resistance to forces of displacement.
4. Describe the details of the various molars.
5. Compare the various molars: maxillary and mandibular, as well as first, second and third molars.

XI. Development, Form and Eruption

1. Describe how the tooth germs develop within the crypts.
2. Describe how the lobes or growth centers fuse and form a tooth.
3. Describe how this fusion can take a variety of forms and result in different types of teeth- incisors, canines, premolars and molars.
4. State the number of developmental lobes for each of the molars and where the lobes are located.
5. List the eruption sequence of the deciduous (primary) and permanent dentitions.
6. List the general rules for the eruption of the teeth and the exception to the rules
7. Describe the phenomena of mesial drift, root resorption and exfoliation.
8. Explain the implications of the following terms:
  - a. impacted teeth
  - b. congenitally missing teeth
  - c. attrition
  - d. occlusal plane
  - e. Curve of Spee
9. Describe the periods of the primary, mixed and permanent dentitions.
10. Given a list of primary and/or permanent teeth, the student will be able to put the teeth in the correct sequence of eruption.
11. Differentiate between preclinical and clinical eruption.
12. Describe how passive eruption results from a pathological process.
13. Name the permanent teeth that are least likely to be congenitally missing.
14. List four causes for congenitally missing teeth.

## XII. Deciduous Dentition

1. List the eruption dates for each of the primary teeth.
2. Describe the essential differences between the deciduous and permanent teeth.
3. Describe the importance and functions of the deciduous teeth.
4. Compare the anatomical features of deciduous teeth with other deciduous teeth and their permanent counterparts.
5. List the four reasons for care of the primary dentition.
6. State the difference in tooth number and type in the primary and permanent dentitions.
7. Define exfoliation.
8. Define succedaneous teeth and name the teeth in that category.
9. Define resorption.
10. Define ankylosis.
11. List the basic differences in the shapes (morphology) of the primary and the permanent teeth.
12. List the basic differences between the structuring of the tooth substances and tissues of the primary and permanent teeth.

## XIII. Pulp Morphology

1. Given a drawing of a maxillary molar, the student will be able to label the following structures:
  - a. anastomosis
  - b. apical foramina
  - c. cementum
  - d. chamber floor
  - e. chamber roof
  - f. dentin
  - g. enamel
  - h. pulp canal
  - i. pulp canal - lateral
  - j. pulp chamber
  - k. pulp horn
  - l. secondary dentin
  - m. supplementary canal
2. Define the following terms:
  - a. pulp tissue
  - b. pulp cavity
  - c. pulp chamber
  - d. pulp canal(s)
  - e. pulp horn(s)
  - f. apical foramen

- f. lateral (accessory) canals
  - g. supplementary canal
  - h. anastomosis
3. Explain the formation of the two types of secondary dentin.
  4. Explain changes that occur in the pulp cavity with age.
  5. Explain the relationship of the external contour of a tooth to the outline of the pulp cavity.
  6. Explain the number(s) of pulp canals or pulp horns, which may be found in each permanent tooth and their frequency of occurrence.
  7. Explain the belief that a tooth becomes brittle after root canal therapy.

XIV. Tooth Microstructure

1. List three methods for obtaining knowledge of tooth microstructure.
2. Describe the relative differences (approximate amounts) of inorganic salts, organic matter and water in enamel, dentin and cementum.
1. Describe how the presence of sodium and calcium affect the solubility of tooth substance versus acids.
4. Discuss the significance of thermal expansion and contraction on tooth structure as it relates to choosing a dental material.
5. Discuss the significance of thermal conductivity on tooth structure as it relates to choosing a dental material.
6. List three important physical properties of enamel.
7. List and describe the four functions of dentin.
8. List and describe five different clinical significances of dentin.
9. List two functions of cementum.
10. List three functions of the pulp.

XV. Occlusion

1. Discuss how the eruption schedule, growth and ultimate alignment of the teeth are related.
2. Discuss how muscle forces affect the alignment of the teeth.
3. Discuss the Curve of Spee, the Curve of Wilson and the Sphere of Monson.
4. Describe the way the teeth are aligned vertically -maxillary to mandibular.
5. Define the following terms:
  - a. crossbite
  - b. open bite

6. Describe the relationship that exists between the teeth during lateral excursive movements.
7. Define the following terms:
  - a. anterior guidance
  - b. articulator
  - c. centric occlusion
  - d. centric relation
  - e. centric relation occlusion
  - f. condylar guidance
  - g. cuspid rise
  - h. deflective occlusal contact
  - i. diagnostic casts
  - j. facebow
  - k. freeway space
  - l. group function
  - m. malocclusion
  - n. non-supporting cusp
  - o. occlusal appliance
  - p. occlusal adjustment or equilibration
  - q. occlusal interference
  - r. occlusal prematurity
  - s. physiologic rest position
  - t. supporting cusps
8. State which cusps are supporting and which are non-supporting.
9. List four ways that the line of the central groove may be used as a landmark.
10. Given an illustration of a malocclusion (lateral view), the student will be able to identify it as one of the following:
  - a. Class I malocclusion
  - b. Class II, division one malocclusion
  - c. Class II, division two malocclusion
  - d. Class III malocclusion
11. Define the following terms:
  - a. right or left lateral excursion
  - b. incisal edge position
  - c. working position
  - d. balancing or non-working position

XVI. Clinical Considerations

1. Describe how preventive clinical considerations are related to tooth form and the supportive dental structures.
2. Discuss how occlusal trauma and the natural shape and contour of the teeth can contribute to dental disease.
3. Discuss how the placement of a restoration can contribute to the disease of the supporting tissues.

4. Discuss the reliability of dental pain as a diagnostic aid.
5. Discuss how tooth migration can affect the success of treatment or necessitate different treatment.
6. Define marginal integrity.
7. List the two requirements for the margin of a restoration.
8. Describe the following types of margins and their clinical significance:
  - a. overcontoured margin
  - b. overextended margin
  - c. undercontoured margin
  - d. deficient margin
  - e. open margin

#### XVII. Dental Anomalies

1. Describe the following types of dental anomalies:
  - 1.1 total or partial anodontia
  - 1.2 supernumerary or accessory teeth
  - 1.3 mesiodens
  - 1.4 distodens
  - 1.5 paramolars
  - 1.6 true or false macrodontia
  - 1.7 true or false microdontia (dwarfism)
  - 1.8 taurodontism
  - 1.9 dilaceration
  - 1.10 flexion
  - 1.11 gemination
  - 1.12 fusion
  - 1.13 concrescence
  - 1.14 segmented root
  - 1.15 dwarfed roots
  - 1.16 hypercementosis
  - 1.17 accessory cusps
  - 1.18 accessory roots
  - 1.19 enamel pearls
  - 1.20 Hutchinson's incisors
  - 1.21 mulberry molars
  - 1.22 dens in dente
  - 1.23 complex or compound odontoma
  - 1.24 enamel hypoplasia
  - 1.25 enamel hypocalcification
  - 1.26 amelogenesis imperfecta
  - 1.27 fluorosis
  - 1.28 focal hypomaturation
  - 1.29 Turner's teeth
  - 1.30 Tetracycline staining
  - 1.31 Dentinogenesis imperfecta

XVIII. Root Anatomy/Clinical Significance

1. Describe how the periodontal ligament reacts to occlusal forces.
2. Describe the three main areas where root concavities exist.
3. List two reasons root concavities are beneficial.
4. For each of the permanent teeth, describe the most common forms of root anatomy.
5. Describe on a conical root why the amount of bone loss and the loss of root support differ.
6. List five possible causes for gingival recession.
7. List three treatments for exposed roots that are sensitive.
8. Define bifurcation ridge.
9. Describe why the level of a furcation is important clinically.
10. Define fenestration and dehiscence.
11. Discuss the clinical significance of linguogingival fissures (palatogingival grooves) in maxillary lateral incisors.
12. Describe how roots may be affected in the following anomalies:
  - a. dilaceration
  - b. flexion
  - c. gemination
  - d. twinning
  - e. fusion
  - f. concrescence
  - g. accessory roots
  - h. enamel pearls

XIX. Root Morphology/Instrumentation

1. State the location of grooves, depressions and furcations on anterior teeth, premolars and molars.
2. Explain why the working end of an instrument should be inserted beyond the center of a proximal root surface from both facial and lingual aspects.
3. Describe and demonstrate the following aspects of scaling a proximal root surface close to the epithelial attachment:
  - a. how far the toe of the instrument must be inserted faciolingually
  - b. the orientation of the terminal end to the shank of the instrument to the attachment and long axis of the tooth
  - c. the position of the cutting edge relative to the attachment
4. Describe the motion of the handle and shank of a curet that will keep the blade adapted to a concavity, depression or furcation.

5. Name one mandibular and two maxillary tooth classes that have large mesial root concavities.
6. Describe and demonstrate which edge of a curet should be used to instrument the facial, mesial and distal surfaces of the roots of a maxillary or mandibular molar.
7. State where retained calculus is most often found.
8. State where the deepest root concavity in the mouth is found.
9. Name three teeth and their surfaces that have potential for periodontal involvement due to unique root morphology that requires special consideration for instrumentation.

XX. Bachelor of Science Component

1. The student will propose and satisfactorily complete a project related to dental education, patient care, personal growth, research or service.

## RESOURCES

### I. Media Resources

#### A. Printed media

##### 1. Monographs

#### B. Non-printed media

##### 1. Microfiche

Rout, James L.  
Oral Anatomy Terminology  
Catalog #1088, #1089, #1090  
(microfiche and readers available in Room 330)

##### 2. Study Sets

Study Sets for Tooth Identification (available in Room 330)

### II. Human Resources

#### A. Faculty

Robert O. Dosch, D.D.S.  
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## STUDY PLAN AND REQUIREMENTS

### **Didactic Component**

The didactic component of the course consists of two lecture quizzes, the mid-term examination and the final examination.

The objectives should serve as guidelines in the student's preparation for the course. For those weeks where there is assigned reading in the textbook, it is recommended that the student read that assignment prior to the scheduled lecture. This will make the lecture more meaningful and should improve the student's performance in the course. While the review questions presented at the end of each chapter of the textbook are not comprehensive, it is recommended that each student use these questions to evaluate their understanding of the material. The student is responsible for the material presented in the textbook, lectures and monograph. The quizzes and examinations will tend to stress the material presented in the lectures and monograph.

The first lecture quiz is scheduled for September 14, 2005. It will cover material presented in lecture, reading assignments in the textbook, and monograph for the first four weeks of the course. The student should use the lecture quizzes to help determine if he/she is preparing adequately for the didactic component of the course.

The mid-term examination is scheduled for October 12, 2005. It will cover material presented in lecture, reading assignments in the textbook, and monograph for the first eight weeks of the course.

The second lecture quiz will be on November 16, 2005. It will cover material presented in lecture, reading assignments in the textbook, and monograph for weeks ten through thirteen of the course.

The final examination will be on December 9, 2005. It will cover material presented in lecture, reading assignments in the textbook, and monograph for weeks ten through sixteen of the course.

### Laboratory Component

The terminology quiz will cover the material presented in lecture the first week and microfiche #1088, #1089, and #1090. The following terms are covered mainly in the lecture:

1. mesial and distal contact areas
2. mesial and distal proximal ridges
3. mesial and distal proximal concavities
4. the names of the various embrasures
5. the dental formula for the permanent dentition
6. the dental formula for the deciduous or primary dentition

In preparing for the terminology tests, the student should be certain to study this material along with the assigned microfiches.

For the Tooth ID quizzes, the student should learn the decision-making process described in the monograph. One of the most common mistakes is to not be able to distinguish whether a tooth is a right or a left. Another common mistake is to know which tooth it is, but to name it with an incorrect Universal number. During the tooth ID quizzes, a student will be given approximately forty-five seconds for the identification of an individual tooth. It is a good idea to use one of the ID study sets in a practice test to determine if you have learned tooth identification.

### Bachelor of Science Component

The B.S. component of this course involves the proposal and satisfactory completion of a project related to dental education, patient care, personal growth, research or service. The student and Course Director must agree upon the nature of the project and the timeline for completion.

**DHBS 3109 DENTAL ANATOMY**  
**Fall 2005 Lecture/Laboratory Schedule**

Lecture and lab: Wednesdays, 9-11:50 am

<b>Week</b>	<b>Date</b>	<b>Lecture and Reading Assignments</b>	<b>Laboratory</b>
1	Aug 17	Course Introduction/ Dental Terminology	Check out microfiche and reader
2	Aug 24	Fundamental and Preventive Curvatures; Dentition	Terminology microfiche
3	Aug 31	Incisors	Terminology microfiche
4	Sep 7	Anterior Tooth ID	Tooth ID (anterior) Terminology microfiche
5	Sep 14	<b>Lecture Quiz #1</b>	<b>Terminology quiz,</b> Tooth ID anterior
6	Sep 21	Premolars	Tooth ID (anterior)
7	Sep 28	Molars	<b>Tooth ID quiz,</b> (anterior) <b>Terminology quiz remake</b>
8	Oct 5	Posterior Tooth Identification	Tooth ID (posterior)
9	Oct 12	<b>Mid-term Examination</b> <b>Room 207</b>	Tooth ID (posterior)
10	Oct 19	Pulp Morphology	<b>Tooth ID quiz,</b> (posterior only)
11	Oct 26	Tooth Microstructure	Tooth ID, Review (all)
12	Nov 2	Tooth Development; Eruption; Primary Teeth	Tooth ID, Review (all)
13	Nov 9	Occlusion	Tooth ID, Review (all) <b>Tooth ID (ant. and post.) quiz remakes</b>
14	Nov 16	<b>Lecture Quiz #2.</b> Clinical Considerations; Dental Anomalies	<b>Tooth ID quiz</b>
15	Nov 23	Root Anatomy/Clinical Significance	<b>Tooth ID quiz</b>
16	Nov 30	Root Morphology/Instrumentation-	<b>Tooth ID (all) quiz remakes</b>
17	<b>Dec 12</b> <b>9-10:00 am</b>	<b>Final Examination</b> <b>Room 340</b>	

## EVALUATION METHODS

The regular portion of this course consists of a didactic component and a laboratory component. The regular portion of the course will be worth approximately 92.6% of the final grade for the course. Satisfactory completion of the course requires an overall grade of 70 or better and a minimum attendance of 85% for lecture and laboratory. The grading system for quizzes and examinations will be based on the following scale:

<b>Grade</b>	<b>UT Descriptor</b>
93 –100	A
84 – 92	B
75 – 83	C
70 – 74	D
0 – 69	F

A grade of Incomplete Satisfactory (IS) or Incomplete Unsatisfactory (IU) may also be assigned on the guidelines stated in the Handbook for the School of Dental Hygiene. A student's level of attendance may be given consideration in determination of the final grade.

### Didactic Component

The didactic component consists of two lecture quizzes, a mid-term examination and a final examination. This component is worth 60% of the grade for the regular portion of this course. Each of the lecture quizzes is worth 10% of the grade for the regular portion of the course. The mid-term and final examinations are each worth 20% of the grade for the regular portion of the course.

The lecture quizzes will be approximately fifteen minutes long. They may consist of the following type questions: short answer, fill-in-the-blank, matching, true-false or multiple choice.

The midterm and final examination will be one hour long. They may consist of the same type questions as the lecture quizzes.

### Laboratory Component

The laboratory component includes Dental Terminology and Tooth Identification. This phase is worth 40% of the grade for the regular portion of this course.

There will be one terminology quiz. It will consist of twenty-five slides. The student will be asked to identify the structure or space illustrated on each slide. The quiz is worth 10% of the grade for the regular portion of the course.

There will be four tooth identification quizzes. The student will be asked to identify each tooth with the appropriate Universal number. The first tooth identification quiz will be on anterior teeth. The second quiz will be on posterior teeth. Each of the quizzes will consist of twenty-five teeth. Each of these quizzes will be worth 5% of the grade for the regular portion of the course.

The last two tooth identification quizzes will cover anterior and posterior teeth. Each of these quizzes will consist of twenty-five teeth. Each will be worth 10% of the grade for the regular portion of the course.

### Bachelor of Science Component

The Bachelor of Science portion of this course consists of a special project. **Note:** the student must satisfactorily complete this portion of the course. The project will be worth approximately 7.4% of the final grade for the course. This is equivalent to 8% of the regular portion of the course (didactic and lab

components).

#### Final Course Grade

The final course grade will be equal to  $100/108 \times$  raw score-regular portion of course +  $8/108 \times$  raw score-BS portion of course.

#### Penalty

A 10-point penalty will be assessed on a quiz or examination that is taken late due to an unexcused absence.

#### Attendance

Attendance is required for all scheduled lectures and laboratory periods. Attendance for each laboratory period is defined as the student actively working and interacting with the assigned faculty.

If the student's lack of attendance is contributing to unsatisfactory performance in the didactic or laboratory phase of the course, the Course Director will notify the student. If there is no improvement in attendance, a letter from the Course Director will be sent to the Program Director of the School of Dental Hygiene to document the student's attendance problem. Additional letters will be sent as needed.

A student may receive an excused absence for a lecture or laboratory session. It is the student's responsibility to provide documentation of the reason for the absence to the Course Director and/or the Program Director. The student is responsible for obtaining information, materials, and/or assignments that were presented during the class session missed. For additional information, please consult the "Attendance Policy of the School of Dental Hygiene".

#### Remediation

If a written examination or quiz is failed, the student must make an appointment with the Course Director. The purpose of this meeting is to help the student determine those factors that may have contributed to the unsatisfactory performance. Satisfactory performance is not required on the individual examinations and quizzes. However, the student is encouraged to remake a failing examination or quiz. A student is allowed one remake of each examination or quiz. The Course Director may establish remediation requirements for the student to complete prior to taking a remake examination or quiz. There will be no penalty assessed on the grade of a remake examination or quiz.

If the grade on the remake is failing, the student still has the opportunity to improve the grade. The student should meet with the Course Director to determine further remediation requirements. Following satisfactory remediation, a grade of 70 will be recorded for the examination or quiz.