

DEN5404C: Dental Anatomy and Stomatognathics

Fall 2020

Course Description:

This course acquaints the student with the morphologic components of the natural dentition and related anatomic structures.

I. General Information

Course Director

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Semester: Fall

Course Co-Director

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II. Course Goals

The goal of this course is to provide the student with a detailed understanding of the morphologic components of the natural dentition and related structures. An introduction to the biologic considerations of tooth structures, occlusion, and the stomatognathic system are included to acquaint the student with these topics. After successful completion of this course, students will be able to:

- demonstrate the ergonomics for proper dental practice.
- develop the skills for using waxing instruments and dental wax.
- identify the morphology of the natural dentition.
- identify the biology of the stomatognathic system.
- relate ideal dental occlusion to dental morphology.
- apply digital CAD-CAM technology for effective self-assessment.
- develop efficient time management and professionalism skills with given assignments.

III. Course Overview

The course begins with an introduction to dental nomenclature and is followed by an in-depth study of the morphology of each permanent tooth in the human dentition. Most lectures are followed by a laboratory exercise, which enables the student to practice waxing and carving the anatomy of the tooth. An introduction to tooth histology, occlusion, and the stomatognathic system is also included. Following a thorough study of the permanent dentition, the student is introduced to the deciduous dentition.

This course contains both cognitive and psychomotor objectives and as such it forms the foundation upon which to build subsequent courses that are heavily psychomotor in nature.

Skilled proficiency in manual dexterity sufficient to perform given psychomotor tasks at a competent level is essential to the practice of dentistry. In this course, fundamental dental psychomotor training begins with waxing exercises designed to enhance the student's appreciation for tooth form while at the same time enabling practice in hand-eye coordination to accomplish dental tasks. Evaluation of psychomotor ability is an important part of this course as it relates to restoration of proper tooth form.

Successful completion of this course is required to progress to DEN5405C: Pre-Clinical Operative I.

IV. Course Outline

1. Introduction to dental anatomy
2. Basic nomenclature and introduction to the 3D Tooth Atlas
3. Morphology of the permanent maxillary incisors
4. Morphology of the permanent mandibular incisors
5. Morphology of the permanent canines
6. Morphology of the permanent mandibular premolars
7. Morphology of the permanent maxillary premolars
8. Biologic considerations of tooth structures
9. Occlusion
10. Morphology of the permanent mandibular molars
11. Introduction to the stomatognathic system
12. Morphology of the permanent maxillary molars
13. Periodontal correlations and root anatomy
14. Morphology of the deciduous teeth

V. Course Material

Recommended Textbooks:

Wheeler's Dental Anatomy and Occlusion, Ash and Nelson, 10th Edition, Saunders, 2015, ISBN: 0323263232

Summitt's Fundamentals of Operative Dentistry - A Contemporary Approach, Hilton TJ et al, Fourth Edition, Quintessence Books 2013 , ISBN: 0867155280 (This textbook is required for DEN 5405C, DEN6407C and DEN6408C.)

Recommended Software:

Dental Anatomy and 3-D Interactive Tooth Atlas, Brown & Herbranson Imaging
A free 2 week trial and/or purchase the product directly through their website at ehuman.com.
Technical support contact information: support@ehuman.com or call 650-233-0200 .

Required Laboratory Materials:

Each student is provided with a Kilgore Model, teeth for the waxing exercises, 3D printed enlarged version of the dentoforn teeth for learning features of each teeth to wax-up, four teeth for the psychomotor exams, a block of Renfert sculpting wax, and the required instrument kit. You will also be loaned an alcohol lamp and a caliper.

Additional course materials: (located in canvas modules)

D-01: Dental Terminology

P-01: Photograph of the Permanent Dentition

Dental Lib Guide: <http://guides.uflib.ufl.edu/dental>

VI. Course Objectives

Module #1: Introduction to Dental Anatomy and Anterior Teeth

Objectives:

1. Demonstrate the ideal sitting positions for a dental practice in a clinical and preclinical laboratory setting throughout the duration of the lab.
2. Develop the knowledge about using waxing instruments in the correct manner.
3. Create different structures with dental wax to develop psychomotor skills.
4. Create the ideal dental anatomy of a permanent anterior tooth by subtractive manner using soap carving technique
5. Given a diagram, photograph or description, identify permanent teeth by their proper name and/or number.
6. Identify the type and number of permanent teeth per quadrant, arch, and in total; and identify the type and number of teeth which are anterior or posterior.
7. Identify or describe dental formulae by supplying or selecting the correct information regarding a given dental formula.
8. Identify the correct eruption sequence for permanent teeth and list the correct anticipated eruption dates for all permanent teeth.
9. Identify the proper name for tooth surfaces, line and point angles of a tooth when given a diagram or a description.
10. Describe the tooth-numbering systems used in dentistry.
11. Demonstrate competency in the knowledge of all terms defined and explained in the lectures and handouts.
12. Describe, select the correct response from a list, or use a drawing to identify or label these: mamelons, grooves, pits, ridges, fossae, lobes, cingula, heights of contour, contact areas, developmental depressions, tubercle, cusps, embrasure etc.

13. Develop the skills to critically self evaluate waxed teeth by using the self assessment rubric and Compare Software

14. Given instruction, recreate appropriate anatomical features in wax in a scheduled laboratory session, and subsequently demonstrate competency in performing such exercises on your own in scheduled laboratory "test" sessions.

Module #2: Premolar Teeth, Biologic Considerations of Teeth and Occlusion

Objectives:

Premolar teeth:

1. Demonstrate the knowledge of ideal dental morphology of premolar teeth.
2. Create the ideal dental anatomy of permanent premolar by practicing waxing and carving the teeth anatomy.
3. Develop the skills to critically self evaluate waxed teeth by using the self assessment rubric and Compare Software

Biologic Considerations of Teeth:

1. Describe the following dental tissues: enamel, dentin, pulp, cementum and periodontal ligament.
2. Describe the weight and volume composition of those dental tissues; name the cellular elements involved and the blood and nerve supply.
3. Describe the type and distribution of cells in the dental pulp, including age changes, structure and ultrastructure of odontoblasts.
4. Name all the cells of the pulp and describe the blood vessels and their interaction with nerves and relationship to tissue fluid pressure.
5. Describe the variations in the degree of mineralization and age changes of primary, secondary, and tertiary dentin. Describe peritubular and intertubular dentin, dentinal tubules and their branches.
6. Describe the weight and volume composition of those dental tissues; name the cellular elements involved and the blood and nerve supply.
7. Describe the type and distribution of cells in the dental pulp, including age changes, structure and ultrastructure of odontoblasts. Name all the cells of the pulp and describe the blood vessels and their interaction with nerves and relationship to tissue fluid pressure.
8. Describe the variations in the degree of mineralization and age changes of primary, secondary, and tertiary dentin. Describe peritubular and intertubular dentin, dentinal tubules and their branches.

Occlusion:

1. Analyze proper dental occlusion with formative laboratory exercise.
2. Develop the skills to identify ideal occlusion for permanent teeth.

Module #3: Mandibular Molar and Stomatognathic Systems

Objectives:

Mandibular Molar:

1. Demonstrate the knowledge about ideal morphology of mandibular molar teeth
2. Create the ideal dental anatomy of permanent mandibular molar by waxing and carving

3. Develop the skills to critically self evaluate waxed teeth by using the self assessment rubric and Compare Software

Stomatognathic System:

1. Functional Anatomy (muscles and TMJ)

a. Describe the anatomy and function of the muscles and ligaments involved in mastication.

b. Describe the anatomy and function of the temporomandibular joint.

c. Contrast isometric and isotonic muscle contraction.

d. Describe the articular surfaces of the TMJ eminence and mandibular condyle and contrast these to surfaces in limb joints.

e. Describe how the medial pterygoid muscle could influence an impression of the upper dental arch.

f. Contrast the difference in function of the superior and inferior lateral pterygoid muscles.

2. Occlusion and Mastication

a. Describe intra-arch alignment of the dentition, including concepts of the Curve of Spee, the Curve of Wilson, arch length, and arch width.

b. Describe inter-arch alignment of the dentition, including concepts of supporting centric cusps; vertical dimension of occlusion; guiding or non-centric cusps; maximum intercuspal position (ICP); retruded contact position (RCP); posterior crossbite; Angle's Class I, II (Division 1 and 2) and III

classification of molar relationships; overjet; overbite; deep bite; and anterior open bite.

c. Describe anterior guided, group function, and balanced occlusion.

d. Describe the concept of "mutually protected occlusion."

e. Explain what is meant by balancing (non-working side) contacts and functional (working side) contacts and name the surfaces of the teeth in contact.

f. Describe mandibular movements during chewing.

Module #4: Maxillary Molar and Root Morphology

Objectives:

Maxillary Molar:

1. Demonstrate the knowledge about ideal morphology of maxillary molar teeth

2. Create the ideal dental anatomy of permanent maxillary molar by waxing and carving

3. Develop the skills to critically self evaluate waxed teeth by using the self assessment rubric and Compare Software

Root Morphology:

1. Correctly identify and/or describe the root anatomy of all permanent teeth

2. Describe the relationship of root surface anatomy and contours to periodontal health

Module #5: Deciduous Teeth

Objectives:

1. Describe the general differences between the permanent and deciduous teeth.

2. Describe each surface of the crown and root of all deciduous teeth by describing, selecting from a list the correct response, or identifying from a diagram, any of the following features:
structural entities such as grooves, pits, ridges, cusps, or fossae
relative dimensions and shapes
root numbers, location, and contours
Also, compare any of these features between the various deciduous teeth.
3. Identify which deciduous tooth is described or illustrated, considering the following:
classification, arch, or right or left.
4. Determine the correct universal number for a given diagram, model or sample tooth, or description of any deciduous tooth.
5. Correctly identify the general outline, shape, or dimensions of the pulp chamber, as well as normal numbers and dimensions of pulp canals, for any of the deciduous teeth.
6. List the normal pattern or order of eruption for the deciduous teeth.

VII. Course Competencies

This course teaches the following competencies in the "Competencies for the New Dental Graduate".

Domain VI: Patient Care - A. Assessment, Diagnosis, and Treatment

12: Patient Assessment, Diagnosis, Treatment Planning and Informed Consent: Provide oral health care within the scope of general dentistry to include patient assessment, diagnosis, comprehensive treatment planning, prognosis, and informed consent.

Domain VI: Patient Care - B. Establishment and Maintenance of Oral Health

17: Provide oral health care within the scope of general dentistry to include restoration of teeth.
20: Provide oral health care within the scope of general dentistry to include periodontal therapy.
23: Provide oral health care within the scope of general dentistry to include malocclusion and space management.

VIII. Evaluation

Course Evaluation

Evaluation in this course includes written exams, quizzes, psychomotor exercises, psychomotor exams, assignments, tooth identification exercises and a tooth identification exam. In the objectives when we use the terms "explain," "describe," "discuss," "select," "identify," "correlate," or "relate," students are expected to do so in writing or orally in class or in the laboratory. Students are also expected to be able to choose correct alternatives from multiple choice or true-false questions or to supply short answers to written questions and questions posed

concerning laboratory models, drawings or diagrams. In addition, students are expected to draw portions of tooth anatomy or create tooth forms in wax from memory.

Written Quizzes and Examinations

Quizzes are to be expected and will cover the assigned reading for the day plus any material related to the topic at hand which has been previously covered in lecture or in the laboratory. Quizzes will last approximately 10 minutes and the topics for those are listed on the course schedule. The lowest quiz grade will be dropped from each student's accumulated quiz total when determining course grades. If a student misses a class for any reason, that quiz will be the one dropped. There are no make-up quizzes.

There is one written mid-term examination and one final written examination. The exams will have approximately 60 questions and will cover all course material. All quizzes and written examinations will selectively use questions of the multiple choice, T/F, matching, short answer type, and may include drawing portions of tooth anatomy and may be individual or group assessments. Missed examinations will require a doctor's note and if excused, the make-up exam will be either an essay or oral examination. The make-up examination must be taken within 2 business days of the missed exam or the student's return to school. The highest attainable grade on a missed exam is an 85%.

Tooth Identification Examination

There is one final "station examination" which consists of 45-50 questions pertaining to tooth identification and related questions about tooth morphology. The examination questions will utilize natural, plastic or stone teeth, large models and/or drawings. This exam is cumulative and will include questions on all primary and secondary teeth. Missing this examination will require a doctor's note and if excused, the make-up exam will be either an essay or oral examination. The make-up examination must be taken within 2 business days of the missed exam or the student's return to school. The highest attainable grade on a missed exam is an 85%.

Psychomotor Examinations

Four psychomotor exams are scheduled in this course. These competency exams will require creation of appropriate tooth forms in wax on pre-prepared acrylic teeth similar to those used in the routine daily exercises. These tests will be evaluated to determine if psychomotor competency has been achieved and the scores of these tests will be included in determining the final course grade.

Students who fail a psychomotor exam will be required to take part in a re-assessment of the original procedure to determine whether the student has progressed satisfactorily. Everything that is taught in preclinical courses must be mastered before performing the procedure for a patient. The reassessment occurs at the end of the course during the week set aside for reassessment and remediation. The reassessment must be passed before progressing to the next course in the series (Preclinical Operative I). Students should be required to pass the reassessment but it should not affect their grade at all, it serves to demonstrate they can move on to the next course. Missed examinations will require a doctor's note and if excused, the make-up exam will be a similar examination but may include different teeth. The make-up examination must be taken within 2 business days of the missed exam or the student's return to school. The highest attainable grade on a missed exam is an 85%.

Daily Laboratory Exercises

Daily work will be critiqued by the student first and then by the faculty. Although these daily evaluations will not be counted for grades, they are intended to teach the student to self-assess his/her work and learn the performance criteria used to evaluate competency and how this would translate into grades in a psychomotor exam situation.

Psychomotor Examination and Daily Laboratory Exercises

Student performance is evaluated by an orderly decision-making process. Procedural items are scored 4, 3, 2, or 1 against defined criteria.

A 4 indicates that the criteria was met at a superior level

A 3 indicates that the criteria was met at an acceptable level

A 2 indicates that the criteria was met at a minimally acceptable level

A 1 indicates that the outcome was measured to be at an unacceptable level

For each criterion an evaluative modifier (+) can be assigned to a 1, 2, or 3 grade to indicate that the student identified an error prior to faculty evaluation. Proper terminology and specific locations of all errors must be noted by the student in writing. General non-specific statements will not justify a (+) modifier.

A "1" or "1+" grade on any of the criteria on a psychomotor posttest will result in an automatic failing grade. The percentage assigned is 65% or the actual score, whichever is lower when a score of 1 is given. The percentage assigned is 70% or the actual score, whichever is lower when a score of 1+ is given.

Points are calculated as follows:

4 = 4 points

3+ = 3.25 points

3 = 3 points

2+ = 2.25 points

2 = 2 points

1+ = 0.25 points

1 = 0 points

Assigning Grades:

The following weights will be assigned:

Didactic Component: 47%

Quizzes 08%

Midterm Written Exam 13%

Final Written Exam 13%

Tooth Identification Exam 13%

Psychomotor Component: 50%

Psychomotor Exams 1 - 12.5%

Psychomotor Exams 2 - 12.5%

Psychomotor Exams 3 - 12.5%

Psychomotor Exams 4 - 12.5%

Other Component: 3%

Digital CAD-CAM Self-assessment Assignment # 1- 1%

Digital CAD-CAM Self-assessment Assignment # 2- 1%

Digital CAD-CAM Self-assessment Assignment # 3- 1%

Total - 100%*

While the successful passing grade for this course is a 72% or above, successful completion also includes the following:

1. Pass the didactic portion with a grade of 72% or above
2. Pass the psychomotor portion with a grade of 72% or above
3. Pass the majority of the psychomotor exams with a 72% or above. (Students may not fail the majority of the psychomotor examination, 3 of the 4 psychomotor exams, and pass the course even if the average is above a 72%.)
4. Pass the reassessment evaluation for failed examinations.

Failure to achieve passing criteria will result in an "E" grade for the entire course. The didactic portion of the grade consists of the quizzes, midterm exam, final exam, and tooth identification exam. The psychomotor portion of the grade consists of the psychomotor assignments and psychomotor exams.

Successful completion of this course is a prerequisite for all Operative Dentistry and Prosthodontic Courses.

Attendance and Adherence to the Dress Code are Mandatory

Students must adhere to the dress code as spelled out in the Student Handbook and Clinic Procedure Manual while enrolled in any course in the

Department of Restorative Dental Sciences. It is applicable at ALL times including, lectures, exams, quizzes, assignments and laboratory sessions.
Attendance is mandatory for all sessions.

The following adjustments will be made to the final grades:

1. 5 points will be deducted from the final grade for each lecture or lab missed without an excused absence.
2. 5 points will be deducted from the final grade if a student is tardy 3 times.
3. 5 points will be deducted from the final grade if the routine sheet is not completed and returned by the date established by the course director.
4. 5 points will be deducted from the final grade for each professional variance issued.
5. Failure to comply with the dress code will result in a reduction in your course grade as follows:

1st Offense - You will be asked to leave the class and warned

2nd Offense - You will be asked to leave the class and 5 points will be deducted from the final grade.

3rd Offense - You will be asked to leave the class and 10 points will be deducted from the final grade.

4th Offense - You will be asked to leave the class and 15 points will be deducted from the final grade.

5th Offense - You will be issued an "E" grade in the course

Remediation (for all Department of Restorative Dental Sciences Courses)

In order to pass this course, you must meet the above criteria. Failure to do so will result in an "E" grade for the entire course.

Students failing the course will be awarded an "E" grade, referred to the Student Performance Evaluation Committee (SPEC), and automatically placed on academic probation.

The student must meet with the course director to develop a remediation plan within one week of receiving the failing final grade.

The remediation activities are at the discretion of the course director.

Faculty are available to assist students preparing for this examination, but the responsibility for learning the material resides with the student.

The time and place of the remediation examination will be arranged individually.

Please note that if the course director determines that the student failed the coursework to such an extent that remedial activities would be

inadequate to attain an acceptable level of academic achievement in the course material, the course director can recommend that the student repeat the course as the remedial activity.

The grade required to pass the remediation program will be determined by the course director; however, the highest grade attainable in a remediated course is a "D."

Students failing to satisfactorily complete the remediation program will maintain the "E" grade and be referred to SPEC for consideration for

dismissal or retracking.

A failing grade awarded in any course will remain on the permanent record (when remediation has not been successful).

This course must be passed before progressing to Preclinical Operative I.

Professional Conduct.

The College of Dentistry expects all dental students to be professional in their dealings with patients, colleagues, faculty and staff. Professional and ethical conduct is a mandatory qualification for every practicing dentist.

Attendance and adherence to the dress code are mandatory. In addition, for each lecture and laboratory session, students are expected to be prepared, complete the self-assessment forms, follow all guidelines and instructions (which includes use of iPods, headphones, etc.), and put forth an excellent effort (work the entire lab session, work diligently and make every effort to get the most out of every session).

Professional misconduct observed during lectures, exams, quizzes, and laboratory sessions will result in an Academic Variance (see Pre-doctoral Student Handbook). Five percentage points will be deducted from the final course grade for each academic variance issued.

Faculty Evaluation

“Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://ufl.bluera.com/ufl/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.”

IX. Administrative Practices

Administrative practices for all UFCD courses are universally applied. Exceptions to or deviations from these practices are stated in the individual syllabi by the course director. When

not individually stated in the syllabus, course administrative practices default to those identified under "Course Policies" on the DMD Student Website:

<https://dental.ufl.edu/education/dmd-program/course-policies/>

X. Grade Scale

DEN5404C Grade Scale

Method Letter Grade

Scale 100

Tolerance 0.5 (Final letter grades within this range will be rounded up.)

A 95 - 100

A- 90 - 95

B+ 86 - 90

B 82 - 86

B- 80 - 82

C+ 74 - 80

C 72 - 74

E 0 - 72