

Orthodontic Course Descriptions

DOD 5000

Orthodontic Technique

A comprehensive study of the mechanical principles and practices which are used in the clinical correction of dental and skeletal malocclusion. Emphasis is placed on the application of sound engineering principles to known biological mechanisms. A broad range of appliances will be used to better understand their use and limitation. Several exemplary cases of malocclusion are treated on the typodont demonstrating the mechanical approaches to be used in the orthodontic clinic.

DOD 5010-5060

Orthodontic Clinic & Seminar

The clinical delivery of comprehensive orthodontic care to patients with various forms of malocclusion. Each student will initiate and complete (75%) treatment for approximately 32-40 patients, treated in five different half-day clinic segments, with varying types and degrees of malocclusion. The ABO Discrepancy Index and Objective Grading System are used to assess case complexity and outcomes. While a variety of appliances will be used in the clinic, the basic appliance of choice is the edgewise mechanism. Each seminar segment includes presentation of case reports to the staff, evaluation of patient response in clinic, discussion of techniques, office management, and patient control, as well as all aspects of the science, philosophy and art of orthodontics. Selected chapters from Proffit's and Graber's texts are also assigned to supplement information provided in class discussion.

DOD 5070-5090

Orthodontic/Periodontic Seminar & Clinic

This seminar and clinic segment course is designed to provide basic didactic and clinical knowledge necessary for the treatment of patients presenting with combined ortho-perio problems. Third year perio and second year ortho residents attend this course and are responsible for jointly presenting case reports and treating selected cases.

DOD 5100

Roentgenographic Cephalometrics

This course presents the basic principles and techniques in radiology as related to orthodontics. The anatomy, landmarks, terminology, techniques and interpretation of radiographs of the head will be discussed. Several of the most commonly used cephalometric analyses will be studied and applied to clinical patients. In addition, students will learn how to do and interpret overall and regional superimpositions. The cephalometrics' exercises employed will utilize both digital and hand tracing techniques.

DOD 5120

Orthodontic Literature Review

The students are requested to thoroughly investigate and report on various topics pertinent to the history and practice of orthodontics. The reports are an in-depth survey of the literature with bibliography, presented in a seminar format, in PowerPoint, to their classmates.

DOD 5130

Retention Clinic

This clinic segment will offer the student the opportunity to be involved with the treatment and management of patients in active orthodontic retention status. In particular, patients presenting with the need for a variety of retention appliances and retention needs. The students will be introduced to the basic principles of retention as well as such appliances as upper/lower Hawleys, positioners, invisible retainers and bonded appliances. The main educational component of this course will consist of chairside delivery of care in conjunction with resident, patient and faculty one-on-one consultation. In addition, additional information will be required by reading the retention chapters in the Proffit and Graber textbooks.

DOD 5140

Physiology of Bone & Tooth Movement

The course will begin with an overview of hard tissue types and cells, followed by the discussion of the contributing factors to Ca hemostasis. The dynamic nature of the bone modeling and remodeling at a cellular and molecular level will then be described. The interaction of the genome with mechanical loading and its effect on bone morphology as well as periodontal ligament

adaption to mechanical loading will also be addressed. Finally, to aid in the complete visualization of how these various factors interact at the cellular and molecular level, tooth movement and root resorption will be explained using the inflammatory and mechanical models in bone and PDL response. This will be used as the ultimate example to explain how all factors interact at the cellular and molecular level.

DOD 5781

Biomaterials – Biomechanics

This course combines both orthodontic biomechanics and some biomaterial concepts and applications. It is designed to build upon earlier course material to further improve the residents' understanding of biomechanical principles used in everyday practice as well as provide up-to-date and evidence-based information on alloys and materials used in a modern orthodontic practice.

DOD 5200

Cardiopulmonary Resuscitation

The focus of the Basic Life Support Course for Healthcare Providers is to discuss and simulate the basic aspects of emergency response for infants, children, and adults, ie, rescue breathing, foreign body obstruction, chest compressions and CPR/AED for both single and two rescuers. The ultimate goal of BLS for the HCP is to improve the care of these patients in the professional health setting, and to increase the skills and confidence of healthcare professionals who care for them. The course finishes with a written examination and successful completion culminates in the award of a two year CPR certificate.

DOD 5210-5260

Early Treatment Seminar and Clinic

Covers orthodontic treatment in the mixed dentition with emphasis on different approaches to various dento-skeletal problems. Limited treatment and treatment with functional appliances will be discussed and reviewed with assigned reading materials. Understanding development of the dentition and occlusion is emphasized. Approximately 10 patients, per orthodontic resident, with various dento-skeletal problems in the mixed dentition are assigned. The student is responsible, as appropriate, for diagnosis, case presentation, case management, retention and referral for follow-up.

DOD 5310-5340

TMJ and Occlusion Seminar and Clinic

This clinic segment will offer the student the opportunity to treat cases presenting with orofacial pain and TMJ dysfunction. Students will be required to work up a detailed diagnosis, mount models utilizing a facebow transfer, and construct, where indicated, appropriate orthotics and make necessary referral for medical and psychological follow-up. After TMJ therapy, appropriate recommendations for necessary stabilization follow-up treatments will be made. Time will be spent discussing risk management considerations for the TMJ-orthodontic patient and selected chapters of Okeson's text, *Management of Temporomandibular Disorders and Occlusion*.

DOD 5380-5390

Journal Club

A review and analysis of current orthodontic literature. Students will read and analyze articles from AJO, Angle and other orthodontic journals.

DOD 5440

Human Development

The psycho-social nature of developing children and adolescents will be discussed. Psychological development from infancy through early adulthood will be described with emphasis placed on applying this information to the clinical delivery of health care services. Discussions of specific management problems from the orthodontic clinic will be included in the course whenever they are applicable.

DOD 5510-5560

Dento-facial Abnormalities Seminar & Clinic

This course covers the history of cooperative efforts of oral and maxillofacial surgeons and orthodontists to find combined solutions to dento-skeletal and facial esthetic problems. It will cover diagnosis and treatment planning for acquired and congenital dentofacial abnormalities disturbing the biological and social well being of affected patients. The literature in this field will be reviewed extensively in an attempt to clarify some of the controversies surrounding the multi-faceted subject of orthognathic surgery. Clinical cases will be evaluated and worked-up for treatment jointly by the graduate orthodontic residents and local oral surgeons. Guest lecturers

from various associated disciplines also participate in the program.

DOD 5630

Speech Physiology & Pathology

A review plus detailed consideration of oral, facial and pharyngeal physiology, with particular attention to the functions of mastication, deglutition, and speech. Particular attention will be paid to recent research concerned with relationships between oro-pharyngeal function, arch form, malocclusion, and speech. The course also will entail a consideration of recent thinking and research on the subject of tongue-thrust swallowing and myofunctional therapy. In addition, the course will cover the development of normal speech, language and hearing skills, as well as a consideration of speech, language and hearing pathologies and their typical etiologies. Attention also will be paid to the presumed relationships between aberrations of oro-facial structures and speech production.

DOD 5640

Practice Teaching

This course is designed to expose the orthodontic resident to methods of teaching undergraduate dental students. This course includes the preparation and presentation of assigned lectures, under supervision, as well as overseeing specific laboratory procedures performed by the undergraduate dental students. It also involves the grading of student exams and evaluation of projects.

DOD 5650

Table Clinic Preparation

The course includes the preparation of a table clinic or oral presentation to be presented at the school's Student Professional Day and the Annual AAO meeting. A full orthodontic case work-up, ABO-style, is also presented at the College of Diplomates of the ABO (CDABO Meeting) at the Annual AAO meeting.

DOD 5710

Craniofacial Growth and Development

The course will present an introduction to the general nature of growth, growth curves, and the factors influencing growth and maturation. A review of bone formation (intramembranous and

endochondral) and remodeling principles, embryology of the craniofacial complex, and osteology of the skull will serve as a springboard from which the mechanisms of growth of the calvarium, cranial base, maxilla, mandible, as well as the controlling theories of Scott, Moss, Sicher, and Van Limborgh, will be discussed. The course will terminate with an overview of the application of craniofacial growth data in clinical orthodontics.

DOD 5720

Microbiology and Asepsis

An overview of current microbiological considerations in dentistry, including practical asepsis management. Students will also present recent findings and recommendations related to various topics and lead a discussion of pertinent issues for clinical practice related to each topic.

DOD 5740-5760

Advanced Orthodontic Clinic

The goal of this clinic is to introduce the student to the rigors, pace, and environment of a modern day orthodontic practice. The student will have an opportunity to improve those technical skills needed to be successful upon starting his/her own practice; including four-handed dentistry.

DOD 5780

Biomechanics

This course will introduce the students to the basic physical properties of orthodontic wires and force systems. The subjects of movements, couples, orthodontic tooth movement in three planes of space and the requirement of static equilibrium will be discussed. These basic principles will then be utilized to analyze force systems employed in clinical practice.

DOD 5830-5880

Cleft Lip and Palate Seminar and Clinic

This course is designed specifically to acquaint the graduate student with the cleft lip and palate condition and with the congenital syndromes that frequently include cleft lip and palate. Emphasis is placed on the team approach to diagnosis and habilitation and upon the importance of interdisciplinary cooperation throughout each patient's treatment. The lectures are coordinated with the cleft lip and palate patients being treated by each graduate student. The lecture series

includes information on specific treatment disciplines, a review of the literature associated with cleft lip & palate as well as craniofacial anomalies. Interaction with the cleft palate team at Beaumont Hospital is part of the clinical experience.

DOD 5910

Basic Research Methodology

This course is designed to teach the graduate students epidemiologic principles and methods. Epidemiologic measures and different study designs will be introduced. Issues that need to be considered during the design of a study will be addressed. Students will be able to apply these principles and methods to their research projects through the development of a research proposal. Critical literature review and research proposal will help the students to start their thesis project. At the end of this course, students will have an understanding of basic research design and methods. In addition, lecture material will be reinforced through reading assignments and homework.

DOD 5920

Basic Research Methods Biostatistics

This course is designed to teach the graduate students basic statistical principles. The interpretation and understanding of statistical results will be emphasized. At the end of this course, students will have an understanding of basic statistical methods to enhance their reading of the literature as well as to support their thesis projects. Lecture material will be reinforced through homework.

DOD 5930

Research Project

This course satisfies the Department's independent research project requirement for the attainment of the M.S. degree in Orthodontics. The Department offers a number of research facilities, opportunities, and topics, however, the student is encouraged to develop his own research question and research design, with only supportive and logistic help from the Department or the research facility involved. This course will be viewed as consisting of three phases, although graded as one at project completion in term VI. Phase I will involve formulation of the research idea, review of appropriate literature, formulation of the research hypothesis, and the methods and materials to be used in the project. Phase II will involve data collection. Phase III will involve analysis and

interpretation of the data and finalization of the article to be submitted to a professional journal.

DOD 5940

Orthodontic Continuing Education Seminar

A series of guest lecturers by outstanding professional persons will expose graduate students to the many diverse approaches to the practice of orthodontics not presently taught within the structured curriculum. Emphasis will be put on the difference in individual approaches to such things as: Treatment planning and mechanics, timing of treatment, practice management, orthodontic business administration, and auxiliary utilization. In addition, issues relating to ethics, public health aspects and epidemiology of malocclusion as well as pain and anxiety control in the orthodontic patient will be addressed. These seminars will be scheduled throughout the two years at the Universities of Michigan, Detroit Mercy and other in and out-of-state venues. Throughout the year other courses may be added based upon changing curriculum needs of the department, unique and special opportunities in didactic and clinical areas, as well as accreditation requirements of CODA.

DOD 5950

Advanced Orthodontic Seminar

A series of guest lecturers by outstanding professional persons will expose graduate students to the many diverse approaches not only to the practice of orthodontics but also to the complexities of multidisciplinary patient care as viewed through the eyes of various generalists and specialists, outside of the orthodontic field. Emphasis will be put on the difference in individual approaches to such things as: Treatment planning for the patient presenting with complex problems, timing of treatment, practice management, and orthodontic business administration.

DOD 5980

Cranio-Facial Pathology and Genetics

A study of pathologic conditions affecting the cranio and oral regions. Clinical features are correlated to the embryological, anatomical, and histological alterations and characteristics of each pathologic condition. Special emphasis is given to description of these pathological syndromes with cranio-facial manifestations.

DOD 5990

Physiology and Pharmacotherapeutics

#1 Course Description: Case-Based Pharmacological Pain Management

Questions such as, “My patient is taking 12 medications and has significant systemic pathology. What is the best analgesic option for his acute pain?” or, “What pharmacological strategies can I employ for chronic pain management?” can arise in dental practice. This course will present an overview of different classes of analgesic agents and the combination of analgesics, which are commonly employed in dentistry. Using various cases the presenters will lead participants to consider different pharmacological strategies for pre- and/or post-operative acute pain management, and in the selection of drug strategies for chronic pain cases.

#2 Course Description: Antimicrobial Agents in General Dentistry

Systemic antibiotics, antifungal, and antiviral agents are employed in dentistry to treat and/or manage facial infections. This program will review and update oral health providers on the common antimicrobial agents employed in dentistry and focus on the pharmacology, adverse effects, and drug interactions of these agents. The presenter will compare different antibiotics and antimicrobial agents, discuss their appropriate use, indications, and contra-indications.

#3 Course Description: Acute Pain Management in Dentistry

This course will review pain pathophysiology and different classes of analgesic agents commonly used in dentistry. Specifically, the mechanism of action, adverse effects and drug interactions, as well as the indications for each class of analgesic will be presented. The presenter will discuss pharmacological strategies for pre-operative and post-operative pain management and the concept of the ‘analgesic ladder’.

DSD 5111

Ethics & Professional Responsibility

The course will include presentations, discussion and online modules to provide information to the participants. The course utilizes ethical codes, regulatory law and ethical theories, recognized

central values and professional obligations to enhance the foundational principles presented. Cases will be presented throughout the course to encourage discussion and analysis. Students are expected to identify an ethical dilemma and apply a decision making model for the analysis and resolution of the dilemma. Students are required to present their dilemma to student colleagues and lead an ethical rounds discussion about the case, applicable ethical and legal principles and an appropriate ethics based resolution.

DBS 5010

Head and Neck Anatomy

This course consists of head and neck dissection with emphasis on structures and functions relating to dentistry in general as well as the specialties.

DRD 5000

Graduate Dental Materials

This course starts out with a quick review of materials science and then builds on that review for developing descriptions of current dental materials and the material unique to Orthodontics. Important properties are discussed first and the four basic types of materials are reviewed, followed by a discussion of metals, emphasizing those important in orthodontics and the other dental specialties. This course ends with a review of polymers, cements, ceramics, and composites. The students are required to give presentations and write research reports on selected types of materials.