

Dentistry Certificate: Endodontics

KORNBERG SCHOOL OF DENTISTRY

Learn more about the certificate in Endodontics.

About the Certificate

The postgraduate certificate in Endodontics is a full-time, 24-month program accredited by the American Dental Association's Commission on Dental Accreditation (CODA). This certificate program also fulfills the educational requirements for specialty board certification by the American Board of Endodontics.

Time Limit for Certificate Completion: 2 years

Campus Location: Health Sciences Center

Full-Time/Part-Time Status: Full-time study is required.

Job Prospects: Students who graduate from the Endodontology program are well prepared to pursue a specialized career in endodontics, whether in academics, administration, clinical and private practice, or research. Graduates have expertise in endodontics and oral biology, as well as the experience and compassion necessary for a patient-centered practice.

Non-Matriculated Student Policy: Non-matriculated students may enroll in some courses with permission from the course instructor and approval from the Kornberg School of Dentistry Office of Graduate Education.

Financing Opportunities: Limited financial support is available for dental residents.

Admission Requirements and Deadlines

Application Deadline:

Fall: August 1

APPLY ONLINE to this professional program.

Applicants for the Endodontics certificate program must utilize the Postdoctoral Application Support Service (PASS), which is a centralized application service sponsored by the American Dental Education Association (ADEA) for individuals applying to advanced dental education programs. The ADEA PASS application must be completed via the ADEA's website at https://www.adea.org/dental_education_pathways/PASS/applicants/.

All Endodontics applicants must submit their application materials to PASS by July 15 to allow PASS sufficient time to process their materials and submit them to Temple by our August 1 deadline. Please check with PASS to ensure that your information has been received as they will only forward completed records to Temple University for assessment.

Letters of Reference:

Number Required: 3

From Whom: Letters of recommendation should be obtained from dental school faculty or supervisors. At least two of the letters must be written by faculty who can evaluate the applicant's clinical skills.

Degree Required for Admission Consideration: Applicants must hold the D.D.S. or D.M.D. degree from a U.S. or Canadian dental school accredited according to the standards of the American Dental Association's Commission on Dental Accreditation (CODA).

International applicants must verify that their training is equivalent to a CODA-accredited institution by using one of these foreign academic credentialing services: World Education Services or Education Credential Evaluators.

Standardized Test Scores:

NBDE: Required. All applicants must have passed the National Board Dental Examination (NBDE) Part I and Part II. If the applicant is currently a senior dental student, results from Part II may be forwarded directly to Kornberg School of Dentistry once received. If the applicant took the Integrated National Board Dental Examination (INBDE), evidence must be provided of the INBDE's satisfactory completion.

TOEFL iBT: 100 minimum required.

Transcripts and Credential Evaluation: Official transcripts from all colleges, universities, and dental schools attended must be submitted. Transcripts should include GPA and class rank. Submit transcripts through the ADEA PASS application.

Note that PASS does not accept undergraduate college transcripts. Applicants must send official transcripts for their undergraduate study directly to Kornberg School of Dentistry at https://apply.temple.edu/DENTAL_CERT/Pages/Welcome.aspx as part of the required Temple University application identified below.

Resume: Current resume required. Submit resume through the ADEA PASS application.

Supplemental Document: When applying to the Endodontics certificate program, a separate Temple University application and application fee of \$50 are required. SUBMIT ONLINE the Temple application and fee.

Certificate Requirements

Required Courses:

Code	Title	Credit Hours
Core Courses ¹		
ORBG 8011	Molecular Oral and Craniofacial Biology	1
ORBG 8012	Advanced Dental Pharmacology and Therapeutics	1
ORBG 8013	Introduction to Evidence-Based Dentistry	1
ORBG 8014	Clinical Anatomy of the Head and Neck	1
ORBG 8015	Research Methodology and Study Design	1
ORBG 8016	Cases in Oral and Maxillofacial Pathology	1
ORBG 8017	Oral Microbiology and Immunology	1
ORBG 8018	Biostatistics	1
ORBG 8019	Advanced Oral and Maxillofacial Radiology	1
ORBG 8033	Bioethics and Critical Thinking in Dentistry	1
Additional Courses		
ENDG 8112	Pulp Biology I ²	2
ENDG 8113	Periapical Biology I ²	4
ENDG 8114	Biologic Basis of Disease	2
ENDG 8115	Current Clinical Concepts	2
ENDG 8116	Endodontic Microbiology/Immunology	2
ENDG 8117	Systemic Diseases	1.5
ENDG 8118	Endodontics Surgery	2.5
ENDG 8119	Teaching for Sophomore Preclinical Lab	2
ENDG 8120	Clinical Seminar in Endodontology ³	2
ENDG 8122	Dental Traumatology	1
ENDG 8123	Fundamental Methods and Materials ³	1
ENDG 8130	Current Endodontics Literature Review ³	1
ENDG 8212	Pulp Biology II ²	2
ENDG 8213	Periapical Biology II ²	2
ENDG 9185	Emergency Endodontics Clinic ⁴	3
ENDG 9285	Endodontics Clinic ⁴	12
PERG 8350	Interdisciplinary Comprehensive Dental Treatment Planning Grand Rounds ³	2

¹ Core courses are required of all first-year postgraduate students.

² Course is offered in alternate years.

³ Course is repeatable for additional credit.

⁴ Course is taken eight times for credit.

Plan of Study Grid

Year 1

Fall	Credit Hours
Select one of the following:	2-4
ENDG 8112 Pulp Biology I ¹	
ENDG 8113 Periapical Biology I ¹	

ENDG 8114	Biologic Basis of Disease	2
ENDG 8115	Current Clinical Concepts	2
ENDG 8120	Clinical Seminar in Endodontology ²	2
ENDG 8130	Current Endodontics Literature Review ²	1
ENDG 9185	Emergency Endodontics Clinic ³	3
ENDG 9285	Endodontics Clinic ³	12
ORBG 8014	Clinical Anatomy of the Head and Neck ⁴	1
ORBG 8015	Research Methodology and Study Design ⁴	1
ORBG 8017	Oral Microbiology and Immunology ⁴	1
ORBG 8018	Biostatistics ⁴	1
ORBG 8019	Advanced Oral and Maxillofacial Radiology ⁴	1

Term Credit Hours	29-31
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Spring

ENDG 8116	Endodontic Microbiology/Immunology	2
ENDG 8117	Systemic Diseases	1.5
ENDG 8118	Endodontics Surgery	2.5
ENDG 8119	Teaching for Sophomore Preclinical Lab	2
ENDG 8120	Clinical Seminar in Endodontology ²	2
ENDG 8123	Fundamental Methods and Materials ²	1

Select one of the following:

ENDG 8212	Pulp Biology II ¹	
ENDG 8213	Periapical Biology II ¹	
ENDG 9185	Emergency Endodontics Clinic ³	3
ENDG 9285	Endodontics Clinic ³	12
ORBG 8011	Molecular Oral and Craniofacial Biology ⁴	1
ORBG 8012	Advanced Dental Pharmacology and Therapeutics ⁴	1
ORBG 8013	Introduction to Evidence-Based Dentistry ⁴	1
ORBG 8016	Cases in Oral and Maxillofacial Pathology ⁴	1
ORBG 8033	Bioethics and Critical Thinking in Dentistry ⁴	1
PERG 8350	Interdisciplinary Comprehensive Dental Treatment Planning Grand Rounds ²	2

Term Credit Hours	35
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Summer

Summer Session I		
ENDG 9185	Emergency Endodontics Clinic ³	3
ENDG 9285	Endodontics Clinic ³	12
Summer Session II		
ENDG 9185	Emergency Endodontics Clinic ³	3
ENDG 9285	Endodontics Clinic ³	12

Term Credit Hours	30
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Year 2**Fall**

Select one of the following that was not previously taken: 2-4

ENDG 8112	Pulp Biology I ¹	
ENDG 8113	Periapical Biology I ¹	
ENDG 8120	Clinical Seminar in Endodontology ²	2
ENDG 8122	Dental Traumatology	1
ENDG 8130	Current Endodontics Literature Review ²	1
ENDG 9185	Emergency Endodontics Clinic ³	3
ENDG 9285	Endodontics Clinic ³	12

Term Credit Hours	21-23
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Spring

ENDG 8120	Clinical Seminar in Endodontology ²	2
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ENDG 8122	Dental Traumatology	1
Select one of the following that was not previously taken:		2
ENDG 8212	Pulp Biology II ¹	
ENDG 8213	Periapical Biology II ¹	
ENDG 9185	Emergency Endodontics Clinic ³	3
ENDG 9285	Endodontics Clinic ³	12
PERG 8350	Interdisciplinary Comprehensive Dental Treatment Planning Grand Rounds ²	2
Term Credit Hours		22
Summer		
Summer Session I		
ENDG 9185	Emergency Endodontics Clinic ³	3
ENDG 9285	Endodontics Clinic ³	12
Summer Session II		
ENDG 9185	Emergency Endodontics Clinic ³	3
ENDG 9285	Endodontics Clinic ³	12
Term Credit Hours		30
Total Credit Hours:		167-171

- 1 Course is offered in alternate years.
- 2 Course is repeatable for additional credit.
- 3 Course is taken eight times for credit.
- 4 Core courses are required of all first-year postgraduate students.

Contacts

Certificate Program Web Address:

<https://www.temple.edu/academics/degree-programs/endodontics-certificate-graduate-dn-endg-dent>

Department Information:

Dept. of Endodontology
 Temple University Kornberg School of Dentistry
 3223 N. Broad Street
 Philadelphia, PA 19140
 gradendo@temple.edu
 215-707-2810

Submission Address for PASS Application Materials:

https://www.adea.org/dental_education_pathways/PASS/applicants/Pages/default.aspx

Postdoctoral Application Support Service (PASS) Contacts:

passinfo@passweb.org
 617-612-2065

Submission Address for Temple University Application Materials:

https://apply.temple.edu/DENTAL_CERT/Pages/Welcome.aspx

Department Contacts:

Admissions:

Kornberg School of Dentistry Office of Graduate Education
 3223 N. Broad Street (600-00), Philadelphia, PA 19140
 dentalgrad@temple.edu
 215-707-3305

Graduate Program Director:

Dr. Maobin Yang
 maobin.yang@temple.edu

215-707-5789

Graduate Endodontic Courses

ENDG 8111. Pain in Dentistry: Diagnosis and Control. 2 Credit Hours.

Pathophysiology of orofacial pain, including transmission mechanisms, role of neurotransmitters and neuroregulators, neurology and classification of head and neck pain, differential diagnostic procedures, and a survey of pain control measures. May be repeated for credit.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8112. Pulp Biology I. 2 Credit Hours.

Development, structure, histology, biochemistry, and physiology of tooth pulp tissues in health and disease. May be repeated for credit.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8113. Periapical Biology I. 4 Credit Hours.

Development, structure, histology, biochemistry, and physiology of the tooth root apex and surrounding periapical tissues in health and disease. May be repeated for credit.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8114. Biologic Basis of Disease. 2 Credit Hours.

Basic biologic structures and processes underlying growth and destruction of human body tissues, including fundamentals of acute and chronic inflammation, the complement cascade, mechanisms of cell-mediated and humoral immune responses, ligand-cell receptor complexes, and receptor diseases.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8115. Current Clinical Concepts. 2 Credit Hours.

In this course, students learn to describe the characteristics and variations of ideal root canal access using proper instruments as well as the details of floor anatomy and the location of orifices. They will gain the ability to analyze, synthesize and evaluate data and knowledge related to various aspects of clinical endodontics.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8116. Endodontic Microbiology/Immunology. 2 Credit Hours.

Microbial structure, genetics, disinfection/sterilization, immunology, biology, and virulence relative to pulpal and periapical infections.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8117. Systemic Diseases. 1.5 Credit Hour.

The student will be able to understand the significance of how different diseases and medical conditions may impact Endodontic treatment and prognosis, appreciate the relevance of an understanding of different diseases and medical conditions, and thoroughly learn and discuss the different diseases and medical conditions that may be encountered in treating their patients.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8118. Endodontics Surgery. 2.5 Credit Hours.

This course enables students to understand the rationale for different surgical procedures, adequately and competently perform various endodontic surgical procedures, have a thorough knowledge of the different types of flap designs, and have a complete understanding of how and when to use the different types of guided tissue and bone regeneration materials.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8119. Teaching for Sophomore Preclinical Lab. 2 Credit Hours.

The graduate students participate in teaching the sophomore students in hands-on endodontics prior to their entry into the clinic. This is done on a weekly basis in the Spring semester

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8120. Clinical Seminar in Endodontology. 2 Credit Hours.

Students will become proficient in presenting evidence-based cases at the level of expectation/standard of the American Board of Endodontics.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

ENDG 8122. Dental Traumatology. 1 Credit Hour.

Upon completion of this course, the student should be able to classify, provide a comprehensive treatment regimen, and provide opportunities for analysis, synthesis, and evaluation of data and knowledge on the different types of dental injuries.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8123. Fundamental Methods and Materials. 1 Credit Hour.

The student should be completely knowledgeable as to: 1. The different diagnostic methods; 2. All currently available instruments and instrumentation techniques; 3. The purpose, composition, and uses of all medicaments, irrigants and obturation materials currently in use; 4. The different obturation techniques; 5. Sealers - their uses, composition and purpose; 6. Temporary coronal sealing materials - composition and purpose; 7. Retrofilling materials - composition and purpose.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 8130. Current Endodontics Literature Review. 1 Credit Hour.

Critical review of recent basic science and clinical literature pertinent to endodontics. May be repeated for credit.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

ENDG 8140. Classical Endodontics Literature Review. 1 Credit Hour.

Critical evaluation of classical scientific literature in endodontics and pulp biology. May be repeated for credit.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

ENDG 8212. Pulp Biology II. 2 Credit Hours.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

ENDG 8213. Periapical Biology II. 2 Credit Hours.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ENDG 9185. Emergency Endodontics Clinic. 3 Credit Hours.

Everyday, two endodontic students are assigned to emergency duty to perform emergency Endodontic procedures. This is done on a rotation basis.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

ENDG 9285. Endodontics Clinic. 1 to 12 Credit Hour.

This course focuses on the treatment of patients in the clinic. The student is expected to demonstrate graduate level of proficiency in Endodontic diagnosis, treatment skills, and management of patients. Special clinical emphasis is placed on endodontic re-treatment, periapical surgery, and contemporary management of complex and/or refractory endodontic lesions.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

Oral Biology Courses

ORBG 5001. Introduction to Dental Assisting. 2 Credit Hours.

Designed to provide the student with an introduction to the dental profession, the dental team and the roles and responsibilities of each member of the team, infection control procedures, sterilization and patient confidentiality. Students will also receive basic knowledge of dental terminology, anatomical structures of the oral cavity, and classification of occlusion. Emphasis is placed on applying information to the clinical setting.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 5002. Chairside Dental Assisting. 3 Credit Hours.

Designed to give the student an introduction to dental terminology, medical-dental histories, dental instruments, charting, oral evacuation, instrument transfer and procedure specific tray set-ups. Emphasis is placed on utilization of four handed dentistry skills.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 5004. Dental Radiology Lecture and Lab. 2 Credit Hours.

Designed to provide the student with basic knowledge of the principles of radiology and radiographic techniques including the principles and methods employed in the paralleling technique and radiographic interpretation. Emphasis is placed on the practice of exposing, processing, mounting, and interpreting intraoral radiographs.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 5005. Dental Anatomy. 1 Credit Hour.

Designed to provide students a basic knowledge of dental terminology, anatomical structures of the oral cavity, head and neck region, classification of occlusion and oral pathology of the head and soft tissue.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8011. Molecular Oral and Craniofacial Biology. 1 Credit Hour.

Basic concepts of physiology, biochemistry, and cell biology related to the oral cavity and craniofacial complex are explored. Topics include connective tissue biology, the role of saliva in health and disease, muscle function, taste, smell, and other sensory functions, with emphasis on current research. These seminars are designed for first-year students in postdoctoral programs in which advanced courses are combined with specialty training. The course outlines scientific information about molecular biology that contributes to our understanding of normal structures and disease processes. Wherever possible, it indicates how this information is useful or impinges on clinical dentistry. This course presupposes a broad background in the basic sciences and interrelates much recently acquired scientific information about the oral cavity that has not been attempted at the predoctoral level.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8012. Advanced Dental Pharmacology and Therapeutics. 1 Credit Hour.

Pharmacotherapeutics of drugs most often used in dentistry, with emphasis on mechanisms, interactions, and effects of drugs used in prevention, diagnosis, and treatment of oral diseases, and drugs used for systemic diseases that may influence the progression or management of oral diseases.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8013. Introduction to Evidence-Based Dentistry. 1 Credit Hour.

Contemporary topics and research presentations on oral and craniofacial biology.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8014. Clinical Anatomy of the Head and Neck. 1 Credit Hour.

Growth and development of the head and neck in relation to general gross anatomy; surgical anatomy of the head and neck region with neuroanatomic studies of cranial nerve anatomy, function and pathology; temporomandibular joint structure, function and dysfunction.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8015. Research Methodology and Study Design. 1 Credit Hour.

Fundamental principles involved in planning, conducting, analyzing, and reporting of scientific research studies, including classification of study designs, hypothesis testing, clinical trial requirements, protocol and grant preparation, scientific writing, analysis and interpretation of data, and approaches to critical evaluation of the scientific literature.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8016. Cases in Oral and Maxillofacial Pathology. 1 Credit Hour.

Students are taught to formulate appropriate clinical and radiographic differential diagnoses for common soft and hard tissue abnormalities of the oral and perioral region via case based discussions. Students receive instruction in the management of patients with common oral mucosal diseases. Indications for patient referral to medical or dental specialists for diagnostic evaluation or disease management are presented. Critical thinking is emphasized in case-based modules. During the case based discussions, students will be asked to describe the lesions using appropriate terminology, offer a prioritized differential diagnosis, suggest a diagnostic plan and recommend management strategies for the entities discussed. The use of a SOAP note format for documenting problem focused patient encounters in oral and maxillofacial pathology will be applied.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8017. Oral Microbiology and Immunology. 1 Credit Hour.

Study of microorganisms and host responses important in oral microbial ecology, oral infectious processes, and the pathogenesis of dental caries, periodontal diseases, dental implant infections, endodontic infections, oral mucosal lesions, and dental focal infections at non-oral body sites.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8018. Biostatistics. 1 Credit Hour.

Introduction to statistical analysis as it applies to biomedical research, including descriptive and inferential statistics. Topics include summarizing and displaying data, theory of measurements and distribution, significance testing, and basic concepts of probability and association.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8019. Advanced Oral and Maxillofacial Radiology. 1 Credit Hour.

Applications of digital dental radiography, panoramic radiology, tomographic imaging for dental implants, computed tomography (CT), and magnetic resonance imaging (MRI); differential interpretations of clinically significant oral and maxillofacial lesions.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8021. Microbiome. 3 Credit Hours.

Course will focus on the biology, ecology, and cell behaviors in the human microbiome in the whole body with a specific emphasis on the oral cavity. Course will also cover the epigenetic changes that may occur in the microbiome and the range of health issues such as obesity, infections, and risk of developing dental and oral mucosal diseases.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8022. Microbiome Techniques. 2 Credit Hours.

This course will cover topics related to laboratory techniques employed to study microorganisms in general and the human microbiome in particular. The topics will range from basic techniques including microscopy, cultivation and biochemical and immunological identification to advanced molecular techniques including nucleic acid amplification, hybridization and sequencing, with particular focus on microbiome analysis.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8023. Craniofacial Bone Biology and Maxillofacial/Dental Orthopedic Care. 2 Credit Hours.

This introductory course will review bone biology and how bone develops and remodels in orthodontic and orthopedic care.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8024. Regeneration of Bone and Dental Hard Tissues. 1 Credit Hour.

This course will focus on dentin and bone regeneration research already being conducted at the dental school and Temple University Center for Bioengineering Research.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8025. Temporomandibular Joint Biology. 2 Credit Hours.

This course will cover the anatomy, mechanics, and function of the temporomandibular joint (TMJ) and associated muscles and ligaments. The course will also cover the dysfunctions commonly diagnosed in dental practice and how they may be manifested in the operation of the TMJ complex.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8026. Neuroscience of Pain. 2 Credit Hours.

This course will focus on the understanding of the biology of pain and how the transmission of pain signals throughout the central and peripheral nervous system. The course will also cover the mechanisms involved in determining pain thresholds and the myriad of psychological responses to pain sensations.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8027. Biology of Drug Delivery Mechanisms. 2 Credit Hours.

This course will focus on how the oral cavity and salivary glands can be used as bioreactors that may be used to deliver drugs, genes, proteins and other molecules to treat a variety of oral and systemic conditions. The course will also cover the mechanisms involved in determining pain thresholds and the myriad of psychological responses to pain sensations.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8028. Basic and Advanced Statistical Methods. 3 Credit Hours.

An introduction to statistical theory and applied methods, including modeling techniques, to analyze dental data. The course will describe the impact of clustering effects of data points in the oral cavity; correction for design effects; methods of analysis of different dental outcomes; and appropriate statistical modeling methods useful in contemporary studies.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8029. Behavioral Change Theories and Practice. 2 Credit Hours.

This course will review and apply selected behavioral change theories in addressing common behavioral problems including addiction.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8031. Biomaterials. 2 Credit Hours.

Developing materials for use in dentistry and medicine is a challenging interdisciplinary process and requires an understanding of material bulk and surface properties, the various biological responses to materials, the clinical context of their use, manufacturing processes, cost, sterilization, packaging, and regulatory issues. This course is designed to introduce students to the various classes of biomaterials in use, their analysis and regulation, and examination of some of their applications in selected subspecialties of dentistry and medicine.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8032. Practical Clinical Practice. 3 Credit Hours.

Students will be assigned as dental assistants, quality evaluators, or patient advocates in the dental school clinics.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:

(ORBG 5001|Minimum Grade of C|May not be taken concurrently)
AND (ORBG 5002|Minimum Grade of C|May not be taken concurrently)
AND (ORBG 5004|Minimum Grade of C|May not be taken concurrently)
AND (ORBG 5005|Minimum Grade of C|May not be taken concurrently)

ORBG 8033. Bioethics and Critical Thinking in Dentistry. 1 Credit Hour.

This course introduces dental residents to the theoretical and practical foundations of bioethics. After an introduction to the history of bioethics and its theories, tools, and strategies for identifying and resolving ethical dilemmas, students will critically explore four key components of contemporary dental ethics: 'Ethics at the Chairside' covering topics such as confidentiality, truth telling, and cultural competency; 'Oral Health Disparities' which introduces the social determinants of health into the oral health equation; 'Research and Industry' designed to teach residents to critically think about conflicts of interest and professionalism; and 'Policy Perspectives' which covers oral health and social justice and the relationships between dental practitioners, health care reform, and oral health.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8034. Advanced Practical Clinical Practice. 3 Credit Hours.

This is an advanced course where students will continue to be assigned as dental assistants, quality evaluators or patient advocates throughout the dental school clinic.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8035. Introduction to Orthodontics. 2 Credit Hours.

The objective of the course is to introduce the post baccalaureate student to the processes of normal craniofacial growth and development in order to recognize and identify deviations from normal. The course emphasizes developmental dentistry, application to clinical orthodontics and postnatal craniofacial growth. Foundation knowledge in orthodontic diagnosis will be developed to allow systematic description of clinical orthodontic problems, orthodontic diagnosis and generation of an orthodontic patient clinical problem list.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8036. Molecular Technology for Translation to the Dental Clinic. 2 Credit Hours.

Molecular Biology research holds great promise for translation to clinical Medicine and Dentistry. This course is a survey of molecular technology along with its contemporary applications to clinical diagnosis and treatment. The course consists of didactic presentations to review basic concepts and student group discussions to address the importance of new technology for clinical applications, particularly in Dentistry.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 8037. Science of Taste Sensation and Relation with Oral Conditions. 1 Credit Hour.

The "taste" is one of the chemosensory senses (taste, smell, and chemesthesis (or chemical feel, including burn from hot chili peppers and cooling from menthol)). Taste receptors convert gustatory stimuli into signals that sensory afferent fibers could transport to the brain where we have sensory experience of foods and beverages. This course is designed to give students a basic understanding of the anatomy, physiology, and biochemistry of this process. This course is intended to give students a working understanding of the taste cells and taste sensation systems important in dentistry.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

ORBG 9885. Pre-clinical Dental Experience for the Kuwaiti Program I. 6 Credit Hours.

This course is for selected post-graduate students enrolled in the Kuwaiti Program at Temple University Kornberg School of Dentistry. Prior to participation in assigned clinics, the resident's knowledge and skills in the disciplines of direct and indirect restorative dentistry, prosthodontics, and endodontics are assessed. Needed review or update of skills and knowledge are obtained with either assigned exercises in the pre-clinic laboratory, assigned assisting in the AEGD clinic, or with assigned literature reviews.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

ORBG 9886. Pre-clinical Dental Experience for the Kuwaiti Program II. 6 Credit Hours.

This course is for selected post-graduate students enrolled in the Kuwaiti Program at Temple University Kornberg School of Dentistry. Prior to participation in assigned clinics, the resident's knowledge and skills in the disciplines of direct and indirect restorative dentistry, prosthodontics, and endodontics are assessed. Needed review or update of skills and knowledge are obtained with either assigned exercises in the pre-clinic laboratory, assigned assisting in the AEGD clinic, or with assigned literature reviews.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

ORBG 9991. Research in Oral Biology. 1 to 6 Credit Hour.

Limited to M.S. in Oral Health Sciences degree students with graduate program approval.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

College Restrictions: Must be enrolled in one of the following Colleges: Dentistry, Kornberg School.

Repeatability: This course may be repeated for additional credit.

ORBG 9993. Masters in Oral Health Sciences Qualification Exam. 1 Credit Hour.

Master of Science in Oral Health Sciences requires successful completion of the MS OHS Qualification Exam course prior to the student entering into their Masters scholarly activity/research project. All students must establish an advisory committee for their scholarly activity, which will be responsible for submitting grades for the Qualifying Exam, Masters Research, and Defense Presentation courses. The advisory committee will review and approve the student's proposed Masters protocol and monitor student's progress. Each Masters student must deliver a Qualifying Exam Presentation to their advisory committee, to describe and support their Masters project. The Masters project must be formally accepted by the student's advisory committee prior to commencing the project. A comprehensive proposal will be reviewed by the student's mentor and advisors, and will be presented in a qualifying exam presentation to demonstrate appropriate understanding of the project. This proposal contains an introduction, theories, hypotheses, scholarly literature review, research methods, proposed alternatives and any other issues relevant to the project.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

College Restrictions: Must be enrolled in one of the following Colleges: Dentistry, Kornberg School.

Repeatability: This course may be repeated for additional credit.

ORBG 9996. Master's Thesis in Oral Biology. 1 to 6 Credit Hour.

Limited to, and required of, M.S. in Oral Biology degree students with graduate program approval.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.