

Oral Health Sciences, M.S.

KORNBERG SCHOOL OF DENTISTRY

Learn more about the Master of Science in Oral Health Sciences.

About the Program

The M.S. in Oral Health Sciences program is designed to meet the needs of those who wish to pursue an advanced science degree. This flexible program allows students to choose either to survey a range of oral health disciplines or to pursue an interest in one particular discipline. Students may pursue a Clinical Specialty Track, a Clinical Internship Track, or a Non-Clinical Track. Each track requires completion of 30 credits of coursework, with an emphasis on producing a scholarly work that demonstrates mastery of the scientific method and creation of new knowledge.

The M.S. in Oral Health Sciences provides advanced education on the structure, development, and function of oral tissues, their interrelationships, and their relation to other organ systems in both health and disease. Emphasis is on gaining advanced understanding of oral and craniofacial structures and their function in health and disease, as well as application of modern biological principles and research techniques in the diagnosis, treatment, and prevention of oral and craniofacial diseases and anomalies.

Areas of study for the Oral Health Sciences M.S. program include traditional basic biomedical science disciplines, such as advanced biomaterials, advanced digital dentistry, advanced systematic review and critical thinking, anatomy, clinical pharmacology, contemporary laboratory techniques, neurophysiology of pain, oral microbiomes, and regenerative medicine, with emphasis on how these areas relate to oral health and disease. Study and research opportunities are offered in a variety of areas, including, but not limited to, advanced general dentistry, dental biomaterials, oral implantology, oral and maxillofacial radiology, oral microbiology and immunology, oral molecular biology, oral mucosal disorders, periodontal and craniofacial regeneration, pulp biology, and such clinical fields as endodontology, orthodontics, periodontology, and implantology, and public health. The goals of the Oral Health Sciences M.S. program are to:

- advance knowledge and understanding in the scientific field of oral health sciences;
- develop "clinical scholars" in dentistry by offering an adaptive graduate-level education across a variety of dental disciplines applicable to oral health;
- offer oral healthcare professionals the opportunity to attain a deeper, more focused understanding of their respective disciplines; and
- provide graduate-level training and experience in research methodology and technology to better qualify students for careers in academic and/or industry-related oral health activities.

Time Limit for Degree Completion: 4 years, but can be completed in 2 years

Campus Location: Health Sciences Center

Full-Time/Part-Time Status: Students not enrolled in an advanced training certificate program may choose to complete the M.S. degree either full- or part-time. Students enrolled in a Commission on Dental Accreditation (CODA)-accredited advanced training certificate program are full-time.

Interdisciplinary Study: The curriculum of the Oral Health Sciences M.S. program is inherently interdisciplinary and crosses traditional department boundaries of basic biomedical sciences, such as anatomy, microbiology, pharmacology, and physiology. A major strength of the program lies in offering Clinical Internship and Non-Clinical tracks such that students who are not enrolled in a specialty certificate program are able to choose from course offerings across all dental specialty programs and disciplines at Temple University's Kornberg School of Dentistry.

Areas of Specialization: Three tracks are offered:

- Clinical Specialty, which is intended for post-graduate students enrolled in a CODA-accredited advanced training certificate program at the Kornberg School of Dentistry. Coursework in the students' respective post-graduate certificate program is used toward fulfilling the required 30 credits for the M.S. degree.
- Clinical Internship, which is intended to be a stand-alone program for students who are not enrolled in an advanced training certificate program at the Kornberg School of Dentistry, but wish to broaden their understanding of clinical dentistry.
- Non-Clinical, which is intended to be a stand-alone program for students with or without a dental degree who have an interest in advanced master's-level education in oral health sciences. The curriculum for students in the Non-Clinical Track does not include clinical courses.

Job Prospects: Graduates of the M.S. in Oral Health Sciences degree program may be engaged in academic teaching and research careers, private clinical patient care, and industry-related oral health activities.

Non-Matriculated Student Policy: Coursework may not be taken on a non-matriculated basis.

Financing Opportunities: Contact the Office of Graduate Education in the Kornberg School of Dentistry for information.

Admission Requirements and Deadlines

Application Deadline:

Fall: March 1

Applicants either accepted into or applying for one of the advanced training certificate programs at the Kornberg School of Dentistry may submit application documents in conjunction with the PASS application for their certificate program. Information regarding advanced training certificate programs at the Kornberg School of Dentistry can be obtained at <https://dentistry.temple.edu/>.

Applicants not affiliated with one of the Kornberg School of Dentistry's advanced training certificate programs [APPLY ONLINE to this graduate program](#).

Applications are processed as they are received. Late applications may be considered for admission.

Letters of Reference:

Number Required: 3

From Whom: Letters of recommendation should be obtained from faculty members who are familiar with the applicant's academic background and potential for graduate-level study. Referees may know the applicant from dental school or wherever her/his highest degree was attained.

Degree Required for Admission Consideration: Applicants to the Oral Health Sciences graduate program must hold a B.D.S., D.D.S., D.M.D., or an other bachelor's degree from an accredited college or university.

Statement of Goals: In approximately 500 to 1,000 words, address:

- academic and research achievements to date,
- overall career goals,
- specific interest in Temple University's Oral Health Sciences graduate program, and
- area and/or topic of proposed research interests.

Standardized Test Scores:

Applicants who earned their baccalaureate degree from an institution where the language of instruction was other than English, with the exception of those who subsequently earned a master's degree at a U.S. institution, must report scores for a standardized test of English that meet these minimums:

- TOEFL iBT: 100
- IELTS Academic: 7.0
- PTE Academic: 68

Resume: Current resume required.

Program Requirements

General Program Requirements:

Number of Credits Required Beyond the Baccalaureate, B.D.S., D.D.S., or D.M.D.: 30

Required Courses:

Code	Title	Credit Hours
Core Courses		
OHSC 8011	Molecular Oral and Craniofacial Biology	1
OHSC 8012	Advanced Dental Pharmacology and Therapeutics	1
OHSC 8013	Introduction to Evidence-Based Dentistry	1
OHSC 8014	Clinical Anatomy of the Head and Neck	1
OHSC 8015	Research Methodology and Study Design	1
OHSC 8016	Cases in Oral and Maxillofacial Pathology	1
OHSC 8017	Oral Microbiology and Immunology	1
OHSC 8018	Biostatistics	1
OHSC 8019	Advanced Oral and Maxillofacial Radiology	1
OHSC 8033	Bioethics and Critical Thinking in Dentistry	1
Electives ¹		14
Research Courses		

OHSC 9993	Master's Research Qualifying Examination	1
OHSC 9995	Master's Thesis Research	4
OHSC 9996	Master's Thesis in Oral Biology	1
Total Credit Hours		30

¹ Students in the Clinical Specialty Track earn the additional 14 credits from coursework completed in their respective specialized area of study while enrolled in a CODA-accredited advanced training certificate program. Students in the Clinical Internship Track or Non-Clinical Track select their additional 14 credits from the electives identified below.

Approved Electives for the Clinical Internship Track Grouped by Subject Area

Code	Title	Credit Hours
Dental Public Health Sciences		
DPHS 8001	Foundations of Dental Public Health	3
DPHS 8002	Administration in Dental Public Health	2
DPHS 8003	Epidemiology and Prevention of Oral Diseases	3
DPHS 8004	The Role of Behavioral Science in Dental Public Health	1
DPHS 8005	Provision and Financing of Dental Public Health	2
Endodontology		
ENDG 8112	Pulp Biology I	2
ENDG 8113	Periapical Biology I	4
ENDG 8114	Biologic Basis of Disease	2
ENDG 8116	Endodontic Microbiology/Immunology	2
ENDG 8117	Systemic Diseases	1.5
ENDG 8122	Dental Traumatology	1
Oral Biology		
ORBG 5001	Introduction to Dental Assisting	2
ORBG 5002	Chairside Dental Assisting	3
ORBG 5004	Dental Radiology Lecture and Lab	2
ORBG 5005	Dental Anatomy	1
ORBG 8021	Microbiome	3
ORBG 8022	Microbiome Techniques	2
ORBG 8023	Craniofacial Bone Biology and Maxillofacial/Dental Orthopedic Care	2
ORBG 8024	Regeneration of Bone and Dental Hard Tissues	1
ORBG 8028	Basic and Advanced Statistical Methods	3
ORBG 8029	Behavioral Change Theories and Practice	2
ORBG 8031	Biomaterials	2
ORBG 8032	Practical Clinical Practice	3
ORBG 8034	Advanced Practical Clinical Practice	3
ORBG 8035	Introduction to Orthodontics	2
ORBG 8036	Molecular Technology for Translation to the Dental Clinic	2
ORBG 8037	Science of Taste Sensation and Relation with Oral Conditions	1
Orthodontics		
ORTG 8404	Orthodontic Biomechanics	2
ORTG 8407	History of Orthodontics	1
ORTG 8408	Craniofacial Cephalometrics	3
ORTG 8414	Growth and Development of the Craniofacial Complex	2
ORTG 8416	Clinical Biomechanics	1
ORTG 8419	Orthodontic Principles and Techniques	1-4
ORTG 8424	Biology of Tooth Movement	2
Periodontology		
PERG 8301	Introduction to Postgraduate Periodontology	2
PERG 8306	Introduction to Oral Implantology	1

PERG 8310	Classic Periodontal Literature Review	2
PERG 8313	Conscious Sedation	2
PERG 8320	Current Periodontal Literature Review	1
PERG 8340	Oral Implantology Literature Review	2

Approved Electives for the Non-Clinical Track Grouped by Subject Area

Code	Title	Credit Hours
Dental Public Health Sciences		
DPHS 8001	Foundations of Dental Public Health	3
DPHS 8002	Administration in Dental Public Health	2
DPHS 8003	Epidemiology and Prevention of Oral Diseases	3
DPHS 8004	The Role of Behavioral Science in Dental Public Health	1
DPHS 8005	Provision and Financing of Dental Public Health	2
Endodontology		
ENDG 8114	Biologic Basis of Disease	2
ENDG 8117	Systemic Diseases	1.5
Oral Biology		
ORBG 5001	Introduction to Dental Assisting	2
ORBG 5002	Chairside Dental Assisting	3
ORBG 5004	Dental Radiology Lecture and Lab	2
ORBG 5005	Dental Anatomy	1
ORBG 8021	Microbiome	3
ORBG 8022	Microbiome Techniques	2
ORBG 8023	Craniofacial Bone Biology and Maxillofacial/Dental Orthopedic Care	2
ORBG 8024	Regeneration of Bone and Dental Hard Tissues	1
ORBG 8028	Basic and Advanced Statistical Methods	3
ORBG 8029	Behavioral Change Theories and Practice	2
ORBG 8031	Biomaterials	2
ORBG 8032	Practical Clinical Practice	3
ORBG 8034	Advanced Practical Clinical Practice	3
ORBG 8035	Introduction to Orthodontics	2
ORBG 8036	Molecular Technology for Translation to the Dental Clinic	2
ORBG 8037	Science of Taste Sensation and Relation with Oral Conditions	1
Orthodontics		
ORTG 8407	History of Orthodontics	1
ORTG 8414	Growth and Development of the Craniofacial Complex	2
Periodontology		
PERG 8301	Introduction to Postgraduate Periodontology	2
PERG 8306	Introduction to Oral Implantology	1
PERG 8313	Conscious Sedation	2

Culminating Events:

Qualifying Exam Presentation:

Prior to commencing the master's project, the student's Master's Advisory Committee (MAC) must formally accept the project plan. All students must establish a MAC for their scholarly activity, which reviews and approves the student's proposed master's protocol and monitors the student's progress. The committee should consist of a primary faculty research mentor who serves as committee chair, another faculty member who has expertise in the area of research, and a third faculty member from another department who may have expertise in the area to be studied.

The primary research mentor must be a member of the Temple University graduate faculty and approved by the Chair of the student's home academic department at the Kornberg School of Dentistry or the Assistant Dean for Advanced Clinical Education. The MAC must include members of at least two different departments at the Kornberg School of Dentistry, one of which must be the academic department representing the student's area of research. MAC members may include experts from outside of Temple University. In addition, the Assistant Dean for Advanced Clinical Education may serve as an ex-officio member of the committee. The majority of members of the MAC must be members of the graduate faculty. The committee has responsibility

for submitting grades for OHSC 9993 Master's Research Qualifying Examination, OHSC 9995 Master's Thesis Research, and OHSC 9996 Master's Thesis in Oral Biology.

The comprehensive project plan is reviewed by members of the student's MAC and is then presented by the student 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.

Master's Research Project:

All students, regardless of their chosen track, complete a scholarly work acceptable to their MAC. The thesis may be an original research investigation, a self-directed capstone project, or a systematic review:

1. The original research investigation demonstrates the student's ability to design and carry out original research, and to analyze, interpret, and present the resulting data under the supervision of an approved research mentor. The thesis must address a well-focused, scientifically meaningful question and a hypothesis that is of adequate scope and significance to qualify for an M.S. degree.
2. The self-directed capstone project results from the student's applying what has been learned throughout the course of graduate study in the examination of a specific idea. Successful projects are those that have added to the technological and practical advancements involved in the oral health sciences field. Capstone projects identify, define, and research a pertinent problem or opportunity in a real-world setting and develop the means to address it. The findings and end product should be something that can be readily implemented and used.
3. A systematic review summarizes the results of available, carefully designed healthcare studies (controlled trials) and provides a high level of evidence on the effectiveness of healthcare interventions. Judgments may be made about the evidence and inform recommendations for healthcare. These reviews are complicated and depend largely on the available clinical trials, the quality of the trials conducted, and the health outcomes that were measured. Review authors pool numerical data about the effects of the treatment through the process of meta-analyses. Authors then assess the evidence for any benefits or harms from those treatments. In this way, systematic reviews are able to summarize the existing clinical research on a topic.

Each project is unique to the student's program and, therefore, the student must continuously consult with her/his MAC to ensure that her/his project is proceeding in a timely manner and is consistent with the qualifying exam presentation. When appropriate, a written manuscript must be submitted and orally defended to the student's MAC. The master's candidate is then invited by her/his MAC to give a formal presentation of her/his project that shall be announced and open to the faculty of the Kornberg School of Dentistry. The date and location are arranged by mutual agreement between the candidate and the MAC. The presentation must meet standards outlined by the MAC regarding foundation, organization, relevance, and practicality of results.

Contacts

Program Web Address:

<https://www.temple.edu/academics/degree-programs/oral-health-sciences-ms-dn-ohsc-ms>

Department Information:

Oral Health Sciences Graduate Program
Kornberg School of Dentistry Office of Graduate Education
3223 N. Broad Street
Philadelphia, PA 19140
louis.dipede@temple.edu
215-707-9664

Submission Address for Application Materials:

<https://apply.temple.edu/DENTAL/Pages/Welcome.aspx>

Department Contacts:

Admissions:

Louis DiPede, D.M.D.
Assistant Dean for Advanced Clinical Education
louis.dipede@temple.edu
215-707-9664

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.