Dentistry (DENT)

Administration
Dean: William K. Lobb, D.D.S., M.S., M.P.H.
Assoc. Dean for Research & Graduate Studies: Sheila Stover, D.D.S., M.S., M.P.H.

Program Directors
Dental Biomaterials: David Berzins, B.S., Ph.D.
Endodontics: Sheila Stover, D.D.S., M.S., M.P.H.
Orthodontics: Dawei (David) Liu, D.D.S., M.S., Ph.D.
Prosthodontics: Geoffrey Thompson, B.A., D.D.S., M.S.

School of Dentistry website (http://www.marquette.edu/dentistry)

Degrees Offered
Master of Science degrees in five disciplines, Plan A only, with two options (see the Master’s Requirements section for details)

Graduate Program Overview
The School of Dentistry offers graduate programs in dental biomaterials, endodontics, orthodontics, periodontics, and prosthodontics. These programs can be modified to allow conjoint interdisciplinary graduate work to be undertaken in any other unit of the university, and a master of science or doctoral degree can be obtained through an appropriate graduate degree-granting department of the university or through the interdisciplinary Ph.D. program. Faculty for each dental graduate program are drawn both from full-time Dental School faculty and from practicing specialists in the field who serve as adjunct faculty (part-time faculty).

The dental biomaterials program is a non-accredited 2-year program leading to a master’s degree.

The master of science programs in endodontics, orthodontics, periodontics, and prosthodontics are clinically and research based, offering specialty certification with the master’s degree. Graduates are prepared to handle complex clinical cases and to work effectively with both general dentists and other dental specialists. The endodontics program is a 24-month program, the orthodontics program is a 26.5-month program, and the periodontics and prosthodontics programs are 36 months each. Tuition for the specialty programs is charged at a flat rate as per the Tuition, Fees and Housing section of this bulletin. Any applicable instrument or service fees are charged during the fall term each year.

Course work requirements for each graduate program are determined by the director of the specific program in accordance with accreditation standards. Courses include study in basic health sciences, dental biomaterials, research methodology, clinical dental specialties and other related science disciplines, as appropriate.

Prerequisites for Admission
Selection for admission is based upon the applicant’s academic standing and clinical abilities. Competitive applicants will rank high in their dental school classes, have strong clinical skills and experiences, and have some experience with research. In general, to be admitted to any of the graduate programs in clinical dentistry, the applicant must have graduated from an accredited dental school.

For the dental biomaterials program, the applicant may be either a dental school graduate or have a baccalaureate degree in science or engineering. In special cases, a student with a baccalaureate degree in another area, but who has an appropriate background, may be admitted to the dental biomaterials program.

Application Deadlines
July 15
For the endodontics program starting in June of the following year.

Aug. 1
For the periodontics program starting in June of the following year.

Sept. 1
For orthodontics and prosthodontics programs starting in June of the following year.

Feb. 1
For the dental biomaterials program starting the following fall term. Applicants are encouraged to have their complete application submitted by February 1 to be considered for the fall entry class. Spring semester entry is possible every other year (even years). The program director notifies admitted students regarding the starting date for their program.
Application Requirements

Applicants must submit, directly to the Graduate School:

1. A completed Marquette University application form and application fee online (http://marquette.edu/grad/future_apply.shtml). Applicants must apply through Marquette, or they will not be considered for admission. In addition, applicants may also apply through the Postdoctoral Application Support Service (PASS) operated by the American Dental Education Association (ADEA), but it is not required. The endodontics and orthodontics programs do not accept PASS.

2. Official transcripts from all current and previous colleges/universities except Marquette. International applicants must have course grades converted to numerical values of 4.00, 3.00, 2.00, and 1.00 or to corresponding letter grades of A, B, C, and D, respectively. Where such a conversion is not possible, an explanation of the grading system used in the foreign dental school and undergraduate institution should accompany the official English translation of the grade transcripts.

3. Undergraduate and dental school grade-point averages, and class rank in dental school.

4. Three letters of recommendation reflecting the applicant’s clinical and academic abilities.

5. Scores from the National Board Dental Examinations, Part I and Part II. Not required from dental biomaterials applicants or from graduates of non-U.S./non-Canadian dental schools.

6. (For dental biomaterials applicants only) GRE scores strongly recommended (General Test only).

7. A curriculum vitae and a personal statement.

8. (For orthodontics and periodontics applicants only) registration with National Matching Service. The orthodontics and periodontics programs are part of the Postdoctoral Dental Matching Program. Details of this program can be obtained through the Departments of Orthodontics and Periodontics.

9. (For international applicants only) a TOEFL score or other acceptable proof of English proficiency.

Non-Refundable Deposit

The Marquette University School of Dentistry requires that all admitted students to the graduate prosthodontics program submit a non-refundable deposit of $3,000 to the Graduate School, in order to guarantee a spot in the program. The deposit is then applied toward tuition after the student registers for the initial summer session.

Non-Degree Students in Dentistry Courses

Normally, students with non-degree status are not permitted to enroll in dentistry courses. Graduate students from approved dental residency programs may enroll in any dental graduate courses but need prior approval from the School of Dentistry’s associate dean for research and graduate studies.

Dental Graduate Didactic Core Curriculum

The Dental Graduate Didactic Core Curriculum (DENT 6001-6003) is designed to cover all didactic content areas applicable to the advanced practice of general dentistry and to each of the specialty areas of dentistry. The content areas are sequenced to present:

1. material of interest for the general dentist seeking additional training beyond predoctoral dental education
2. material of interest for each of the dental specialty areas
3. advanced material of interest for those intending to pursue academic/research careers.

The presentations are organized to emphasize the overlapping nature of scientific foundational material and each of the dental specialties. Additionally, the presentations are designed to accommodate those students entering the program immediately after undergraduate education as well as those students returning from varying years of private dental practice. The course of study is comprised of yearly repeating content cycles (sections) within the summer session and fall/spring terms. The Dental Graduate Didactic Core Curriculum (DENT 6001-6003) is offered from 8-9 a.m. Monday–Friday. Beyond the required classes for their program, students may register for as many DENT 6001-6003 sections as they wish during their graduate education. The sections covered in DENT 6001-6003 are listed below and a detailed description of section content is maintained in the form of comprehensive section syllabi available in the School of Dentistry office of the associate dean for research and graduate studies. Students may register repeatedly for any grading period containing material of interest and are free to rotate in and out of the courses as desired to obtain sections containing such material. Repeated registration for DENT 6001-6003 is differential through the use of section numbers that appear on official transcripts. Examinations and credit hours are variable and are determined by selected course sections. Grades for each course section are submitted directly to the Graduate School by course instructors at the end of each term. Official transcripts will designate the specific sections completed and the credit hours associated with those sections.

The content area sections covered annually by the Graduate Didactic Core Curriculum are as follows:

1. **Emergency Medicine** – A comprehensive review of the pathophysiology and treatment of the most common medical emergency states. Emphasis is placed on prevention, diagnosis, and patient stabilization.

2. **Dental Biomaterials** – Physical, mechanical, chemical, biologic behavior, properties, characterization, and testing of dental biomaterials. Biocompatibility of dental materials as well as advanced clinical concepts for general dentistry.

3. **Advanced Prosthodontic Biomaterials** – Advanced biomaterials and clinical concepts specific for prosthodontics.

4. **Advanced Endodontic Biomaterials** – Advanced biomaterials and clinical concepts specific for endodontics.
The Graduate School offers the following five master's degrees: Dental Biomaterials, Endodontics, Orthodontics, Periodontics and Prosthodontics.

Advanced Orthodontic Biomaterials – Advanced biomaterials and clinical concepts specific for orthodontics.

Interdisciplinary Periodontics – Structure/function of the periodontium. Periodontal disease and therapy as it relates to all other aspects of dentistry emphasizing surgical approaches, occlusion, splinting, and periodontic/endodontic pathosis.

Interdisciplinary Prosthodontics – A comprehensive discussion of prosthodontic procedures as they relate to other areas of dental practice emphasizing removable complete/partial dentures, fixed partial dentures, maxillofacial prosthetics and implants.

Interdisciplinary Endodontics – Endodontic techniques as they relate to other areas of dental practice.

Interdisciplinary Orthodontics – A comprehensive discussion of orthodontic techniques as they relate to other areas of dental practice emphasizing cephalometrics, biomechanics of tooth movement, and tissue response to orthodontic procedures.

Technology and Informatics – A review of the current computer-based technologies available for independent self-directed learning, research, teaching approaches, patient care and professional communication. Emphasis is placed on biomedical applications and laboratory exercises are included to reinforce didactic concepts.

Craniofacial Growth and Development – Dental and facial growth and development from the embryonic period through adult life.

Advanced Oral Pathology – Principles and concepts of histopathology presented through review and microscopic study of surgical material and biopsy specimens of craniofacial lesions emphasizing pathogenesis of disease and histologic diagnosis. Laboratory exercises are included to reinforce didactic concepts.

Head/Neck Anatomy and Osteology – Systemic and regional approaches to the study of head/neck anatomy. Emphasis is placed on vasculature, musculature, innervation, lymphatic drainage, and morphology/anatomical landmarks of the various bones of the head/neck. Laboratory dissection and demonstration reinforce didactic concepts.

Pharmacology and Pain/Anxiety Management – The pharmacology of drugs commonly used for treatment of non-dental conditions that may affect the delivery of dental care either through direct action or through interaction with drugs commonly used in dental care. Emphasizes the neurophysiology of pain, control of pain by various classes of pharmacologic agents, and the behavioral management of dental fears.

Research Methodology/Design – An introduction to the research process. The scientific method is discussed. Emphasis is placed on selection of a suitable research topic, research ethics, simple study designs, and thesis preparation.

Biostatistics – An introduction to the various aspects of biostatistics. Emphasis is placed on data display and summary, summary statistics, populations and samples, probability and confidence intervals, power, type I and II errors, diagnostic tests, correlation and regression, and various test statistics.

Oral Microbiology, Infection, and Immunology – Inflammation, immunity, and oral microbiology emphasizing the mechanisms of microbial colonization and invasion, host response and pathogenesis of dental diseases.

Biochemistry and Physiology of Mineralized Tissues – The chemical and cellular constituents of mineralized tissues and modern methods for their study. Emphasis is placed on bone physiology and metabolism.

Radiology and Imaging – Advanced concepts in radiology and modern imaging techniques applied to all aspects of dentistry.

Craniofacial Anatomy of the Normal and Pathologic State – Current concepts in the cell/molecular biology of inflammation and wound healing emphasizing predictable manipulation of the wound environment.

Cell/Molecular Biology and Molecular Medicine – Current concepts in cell/molecular biology as they relate to diagnostics and treatment with emphasis on immunologic approaches and gene therapy.

Speech Pathology – A review of the various speech pathologies emphasizing the interdisciplinary and integrative nature of treatment involving the dental professional.

Public Health/Public Service – The epidemiology of dental disease and access to care emphasizing the role of the dental professional in community health. A review of current local, state and federal programs for dental services.

Practice Management – A review of the current business aspects of dental practice for all aspects of dental specialties, with special emphasis on solo practice, group practice, dental clinics, and community health centers/institutionalized care.

Practice Law – A review of the current legal aspects of dental practice for all areas of dentistry emphasizing patient care, infection control and employee relations.

Practice Ethics – A review of various ethical dilemmas in practice settings including case studies for group discussion.

Implantology – Basic concepts for implant placement including review of relevant maxillary/mandibular anatomy, evaluation and screening of patients, augmentation considerations, surgical techniques, surgical complications/management and relevant emergency procedures.

The Graduate School offers the following five master's degrees: Dental Biomaterials, Endodontics, Orthodontics, Periodontics and Prosthodontics.
Dental Biomaterials Master’s Requirements

Graduate students in dental biomaterials pursue the application of scientific principles to the study of dental biomaterials including relationships among compositions, physical properties and clinical properties for dental biomaterial systems.

A student in the dental biomaterials program must complete a minimum of 30 credit hours of course work, consisting of a curriculum of graduate dental biomaterials courses (23 credits), statistics (1-3 credits) and thesis work (6 credits). The dental biomaterials graduate program is an interdisciplinary program covering principles of materials science, engineering, chemistry, physics, biology and dentistry. Satisfactory completion of the didactic and research components of the program results in a master’s degree through the Marquette University Graduate School. In addition to the courses offered by the School of Dentistry (described in detail under the Dental Biomaterials course description section of this bulletin), master’s candidates may be required by their program adviser to select courses offered through the Department of Mathematics, Statistics and Computer Science or other departments. Elective courses in appropriate areas such as the dental graduate core curriculum (from the School of Dentistry) or materials science (from the College of Engineering) may also be selected according to the backgrounds and interests of the individual students.

Master of science degree applicants may only be admitted to the program under Plan A, which has two options: the traditional thesis option and the publication option. In partial fulfillment of the requirements to obtain the master of science degree, all candidates must conduct a research project on an appropriate clinical or basic science topic, and successfully defend their research project. Format and content of the public defense is determined by the advisory committee.

Candidates are encouraged to pursue research that originates in their chosen dental specialty. Research projects are selected in consultation with the graduate program director. Where possible, graduate students are encouraged to do clinically relevant research.

Graduate students who choose the thesis option have their research and thesis preparation supervised by a primary adviser and approved by a thesis advisory committee that consists of at least three members. The publication option, in addition, culminates in the acceptance of a first author, original, peer-reviewed publication based on a research project. Selection of the publication option requires completion of a traditional thesis in the event the submitted manuscript is not accepted by the submission deadline listed in this bulletin. All graduate students are required to present their research formally.

Endodontics Master’s Requirements

A student in the endodontics program must complete a minimum of 30 credit hours of course work, including four credit hours in clinical practice per academic year (a total of eight credit hours for each program) and six credit hours of thesis work. The remaining credits may be divided among courses specific to the specialty discipline and elective courses. The endodontics program requires two full years of patient care. Satisfactory completion of the didactic and clinical components of the program results in a specialty certification through the Marquette University Graduate School. Satisfactory completion of the research component of the programs results in a master’s degree through the Marquette University Graduate School.

Master of science degree applicants may only be admitted to the program under Plan A, which has two options: the traditional thesis option and the publication option. In partial fulfillment of the requirements to obtain the master of science degree, all candidates must complete the relevant sections of the graduate core curriculum with a grade of BC or above, conduct a research project on an appropriate clinical or basic science topic, and successfully defend their research project. Format and content of the public defense is determined by the advisory committee.

Candidates are encouraged to pursue research that originates in their chosen dental specialty. Research projects are selected in consultation with the graduate program director. Where possible, graduate students are encouraged to do clinically relevant research.

Graduate students who choose the thesis option will have their research and thesis preparation supervised by a primary adviser and approved by a thesis advisory committee that consists of at least three members. The publication option, in addition, culminates in the acceptance of a first author, original, peer-reviewed publication based on a research project. Selection of the publication option requires completion of a traditional thesis in the event the submitted manuscript is not accepted by the submission deadline listed in this bulletin. All graduate students are required to present their research formally.

Orthodontics Master’s Requirements

The orthodontic program is a 26.5 month program. A student in the orthodontics program must complete a minimum of 30 credit hours of course work, including appropriate credit hours in clinical practice per academic year and six credit hours of thesis work. The remaining credits are divided among courses specific to the specialty discipline and elective courses. Satisfactory completion of the didactic and clinical components of the program results in specialty certification through the Marquette University Graduate School. Satisfactory completion of the research component of the programs results in a master’s degree through the Marquette University Graduate School.

Master of science degree applicants may only be admitted to the program under Plan A, which has two options: the traditional thesis option and the publication option. In partial fulfillment of the requirements to obtain the master of science degree, all candidates must complete the biostatistics and research design and methodology sections of the graduate core curriculum with a grade of BC or above, conduct a research project on an appropriate clinical or basic science topic, and successfully defend their research project. Format and content of the public defense is determined by the advisory committee.
Candidates are encouraged to pursue research that originates in their chosen dental specialty. Research projects are selected in consultation with the graduate program directors. Where possible, graduate students are encouraged to do clinically relevant research.

Graduate students who choose the thesis option will have their research and thesis preparation supervised by a primary adviser and approved by a thesis advisory committee that consists of at least three members. The publication option, in addition, culminates in the acceptance of a first author, original, peer-reviewed publication based on a research project. Selection of the publication option requires completion of a traditional thesis in the event the submitted manuscript is not accepted by the submission deadline listed in this bulletin. All graduate students are required to present their research formally.

**Periodontics Master’s Requirements**

The periodontal program is a three-year program. A student in the periodontics program must complete a minimum of 50 credit hours of course work, including 12 credit hours of clinical practice and six credit hours of thesis work. The remaining credits will be from courses assigned by the course director which are specific to periodontology. The periodontics program requires three full years of direct patient care. Satisfactory completion of the didactic and clinical components of the program results in specialty certification through the Marquette University Graduate School. Satisfactory completion of the research component of the program results in a master’s degree through the Marquette University Graduate School.

Master of science degree applicants may only be admitted to the program under Plan A, which has two options: the traditional thesis option and the publication option. In partial fulfillment of the requirements to obtain the master of science degree, all candidates must complete the appropriate sections of the graduate core curriculum with a grade of BC or above, conduct a research project on an appropriate clinical or basic science topic, and successfully defend their research project. Format and content of the public defense is determined by the advisory committee.

Candidates are encouraged to pursue research that originates in their chosen dental specialty. Research projects are selected in consultation with the graduate program director. Where possible, graduate students in advanced dental specialty programs are encouraged to do clinically relevant research.

Graduate students who choose the thesis option will have their research and thesis preparation supervised by a primary adviser and approved by a thesis advisory committee that consists of at least three members. The publication option, in addition, culminates in the acceptance of a first author, original, peer-reviewed publication based on a research project. Selection of the publication option requires completion of a traditional thesis in the event the submitted manuscript is not accepted by the submission deadline listed in this bulletin. All graduate students are required to present their research formally.

**Prosthodontics Master’s Requirements**

The prosthodontic program is a three-year program. A resident in the prosthodontic program must complete a minimum of 42 credit hours of course work, including 12 credit hours of clinical practice, and six credit hours of thesis work. The remaining credits will be from courses assigned by the program director. The prosthodontics program requires satisfactory completion of a research project and results in a master’s degree through the Marquette University Graduate School.

The master of science degree has two options: the traditional thesis option and the publication option. In partial fulfillment of the requirements to obtain the master of science degree, all residents must complete appropriate sections of the graduate core curriculum with a grade of BC or above, conduct a research project on an appropriate clinical or basic science topic, and successfully defend their research project. Format and content of the public defense is determined by the advisory committee.

Research projects are selected in consultation with the resident, and the graduate program director. Residents are encouraged to do clinically relevant research or pursue the application of scientific principles to the study of dental biomaterials including relationships among compositions, physical properties, and clinical properties.

Residents who choose the thesis option will have their research and thesis preparation supervised by a primary adviser and approved by a thesis advisory committee that consists of at least three members. The publication option, in addition, culminates in the acceptance of a first author, original, peer-reviewed publication based on a research project. Selection of the publication option requires completion of a traditional thesis in the event the submitted manuscript is not accepted for publication at least 60 days before the final day to submit your thesis, to the Graduate School with results and signatures. All graduate students are required to present their research formally.