

2008-2010 GRADUATE CATALOG ONLINE

Dentistry (M.S.)

Degree Offered:	M.S.
Director, Dentistry:	Dr. Amjad Javed
Phone:	(205) 996-5124
E-mail:	javeda@uab.edu
Web site:	www.dental.uab.edu

Faculty

Muna Anabtawi, Instructor (Diagnostic Sciences); Dental materials, Clinical research, Non-carious cervical lesions, Biocompatibility

Ruth Aponte-Wesson, Assistant Professor (Prosthodontics); Biomechanical and Clinical Behavior of Dental Implants

Andrei Barasch, Associate Professor (Diagnostic Sciences); Oral Health and Function in Medically Complex Patients, Oral Cancer Treatment, Oral Oncology

Anton Borovjagin, Instructor (Periodontics); Adenoviral vectors for gene therapy applications. Transductional re-targeting of adenoviral vectors to cancer cells.

James Broome, Professor (Prosthodontics); Polymers, Adhesives, Physical and Mechanical Testing, Clinical Research

John O. Burgess, Professor (Prosthodontics); Clinical Trials, Caries Models, Dental Materials

Deniz Cakir, Instructor (Prosthodontics); Mechanical and physical properties of dental materials, Dental material behavior in simulated oral environment, dental composites, dental polymers

Mary Lynne Capilouto, Professor Emeritus (Diagnostic Sciences); Dental Epidemiology, Advanced General Dentistry

Rama Kiran Chavali, Assistant Professor (Prosthodontics); Clinical research in endosseous dental implants

Haiyan Chen, Instructor (Oral Maxillofacial Surgery); Transcriptional control of bone differentiation and repair.

Noel K. Childers, Professor (Pediatric Dentistry); Streptococcus mutants, Dental Caries, Oral Immunization, Liposomes

John M. Coke, Professor (Diagnostic Sciences); Oral Medicine, Clinical Pharmacology, Hospital Dentistry

Joeseeph Deatherage, Associate Professor (Oral Maxillofacial Surgery); Obstructive sleep apnea syndrome, bone grafting and osteogenic grafting materials, accelerated osteogenic orthodontics.

Juan Dong, Instructor (Orthodontics); Dental and craniofacial genetic disorders.

Paul Eleazer, Professor (Endodontics): Microbiology of Waterlines, Microbiology of Endontic Anaerobic Pathogens

Heidi Erlandsen, Instructor (Periodontics): Protein crystallography, molecular mechanisms of cell signaling, metabolic disease.

Milton Essig, Professor (Comprehensive Dentistry); CAD-CAM, Ceramic Bonded Restorations

Andre Ferreira, Assistant Professor (Orthodontics); Temporary anchorage, self ligation

Steven J. Filler, Professor (Diagnostic Sciences); Medically Compromised Patients, Oral Microbiology

Kohtaro Fujihashi, Professor (Pediatric Dentistry); Mucosal Immunity, Molecular Pathogenesis, Periodontal Disease, Alpha and Beta T Cells and Epithelial Cells

Maria Geisinger, Assistant Professor (Periodontics); Regenerative techniques/materials, Periodontal-systemic interrelationships, optimizing periodontal esthetics

Niclaas Geurs, Associate Professor (Periodontics); Translational clinical periodontal research: Pharmacotherapeutics, Periodontal regeneration, Diagnostic systems, Periodontal disease and systemic effects Implant research, Implant healing, Early loading of implants, Site preparation, Bone grafting procedures

Gregg H. Gilbert, Professor (Diagnostic Sciences); Oral Epidemiology, Dental Health Services

Daniel Givan, Assistant Professor (Prosthodontics and Biomaterials); Composite, Resin, Wear, Fatigue

Timothy Heaven, Associate Professor (Comprehensive Dentistry); Dental Digital Imaging, Use of Computer in Digital Imaging Analysis

Yung-Tsung Hsu, Associate Professor (Prosthodontics); Dental Implants, Complete Denture, Overdenture, Dental Attachment

Janice Jackson, Associate Professor (Pediatric Dentistry); Clinical pediatric dentistry, pulp therapy, childhood caries, childhood obesity

Alexander Jacobson, Professor Emeritus (Orthodontics); Cephalometric Evaluation of Orthognathic Surgery and Skeletal Open Bite Cases

Amjad Javed, Associate Professor (Oral and Maxillofacial Surgery); Bone, cartilage development and remodeling, Adipogenesis, Gene knock-out models, Transcriptional regulation of skeletal cell differentiation.

Donald T. Karaki, Assistant professor (Diagnostic Sciences); Oral Medicine, Oral Radiology, Implants, Diabetes, Head and Neck Oncology

Jannet Katz, Professor (Pediatric Dentistry); Periodontal Disease, Porphyromonas gingivalis, Hag B, T-Helper Cells, Immune Response, Cytokines

Keith Kinderknecht, Professor (Prosthodontics); Axiography, mandibular movement, temporomandibular disorders

Jack E. Lemons, Professor (Prosthodontics); Biocompatibility of Synthetic Materials, Alloys and Casting Technology, Biomechanics

Mark Litaker, Associate Professor (Diagnostics Sciences): Dental Epidemiology, Research Methods, Biostatistics

Perng-Ru Liu, Professor (Comprehensive Dentistry); Dental CAD-CAM, Esthetic, and Dental Implant Restorations

Patrick J. Louis, Professor (Oral and Maxillofacial Surgery); Maxillofacial Reconstruction, Dental Implantology, Dentoalveolar Surgery, Temporomandibular Joint Therapy

Mary McDougall, Professor (Oral and Maxillofacial Surgery): Genetic dental diseases, tooth development, mineralized matrix, gene regulation

Sonia K. Makhija, Assistant Professor (Diagnostic Sciences); Early Occlusal Caries, Geriatric Dentistry, Preventive Dentistry, Evidence-Based Dentistry

Raquel Mazer-Gurmendi, Associate Professor (Comprehensive Dentistry); Dental Materials, Composite Resins, Adhesives, Clinical Investigation, Physical and Mechanical Testing

Michael McCracken, Associate Professor (Prosthodontics); Dental Implants, Biomimetic Materials, Growth Factors

Lillian Mitchell, Assistant Professor (Prosthodontics); Dental implants and implant prostheses, Cad-Cam all ceramic restorations

Steven C. Mitchell, Assistant Professor (Pediatric Dentistry); Early Childhood Caries, Technology, Education

Leonard A. Mueninghoff, Professor (Prosthodontics); Implants, Biomaterials, Microleakage, Adhesives, Veneering, Composites

S. Jean O'Neal, Professor (Prosthodontics); Fixed Prosthodontics, Color and Clinical Evaluation of Dental Materials

Kent G. Palcanis, Professor Emeritus (Periodontology); Clinical Periodontology, Control of Periodontal Disease

Firoz Rahemtulla, Professor Emeritus (Prosthodontics); Connective Tissue Biochemistry, Oxidants and Antioxidant Enzymes, Salivary Proteins, Peroxidases

Lance Ramp, Assistant Professor (Comprehensive Dentistry); Wear and Degradation of Dental Materials

Merrie H. Ramp, Associate Professor (Comprehensive Dentistry); Dental materials Testing

Michael Reddy, Professor (Periodontics); Periodontal Disease Progression, Implants, Periodontal Therapeutics

Michelle Robinson, Associate Professor (Diagnostic Sciences);

John Ruby, Associate Professor (Pediatric Dentistry); Pulpotomy, Pulpectomy, Innate Immunology, Genotyping, *Treponema denticola*

P. Lionel Sadowsky, Professor Emeritus (Orthodontics); Temporomandibular Joint Dysfunction, Growth and Treatment, Surgical Orthodontics, Bonding

Nasser Said-Al-Naief, Assistant Professor (Pathology); Head and Neck Cancer, Bone Related Pathology

Somasak Sittitavornwong, Assistant Professor (Oral Maxillofacial Surgery); Obstructive sleep apnea, airway, fluid dynamics

Huw Thomas, Professor (Pediatric Dentistry); Mineralization, Oral Health, Tooth Formation

Joe P. Thomas, Adjunct Professor (Endodontics); Clinical Caries Investigation, Sickle Cell Anemia

John B. Thornton, Jr., Professor (Pediatric Dentistry); Incidence of Periodontal Disease in the Mentally Retarded, Dental Health of Aging and Elderly Persons with Mental Retardation

Christos C. Vlachos, Clinical Assistant Professor (Orthodontics); Occlusion, Temporomandibular Dysfunction, Orthodontics

Peter D. Waite, Professor (Oral and Maxillofacial Surgery); Orthognathic Deformities, Cosmetic Facial Surgery, Facial Reconstruction, Cleft Lip and Craniofacial Disorders, Obstructive Sleep Apnea

Thomas W. Weatherford, III, Professor (Periodontology); Chemotherapy of Plaque, Clinical Trials in Periodontal Diseases

Richard Weems, Associate Professor (Diagnostic Sciences); Dental Radiology, Digital Radiographic Imaging, Diagnostic Decision Support Software

Hui Wu, Associate Professor (Pediatric Dentistry); Biofilm, adhesin, glycosylation, secretion, bacterial pathogenesis

Ping Zhang, Assistant Professor (Pediatric Dentistry); Immunology, inflammation, periodontitis

Program Information

Advanced clinical specialty training and research, leading to the degree of Master of Science in Dentistry, is offered to meet two areas of need: the preparation of qualified teachers and investigators in the various branches of academic dentistry and the preparation of fully trained dental specialists. The program is a combination of the conventional work for the M.S. degree plus the achievement of proficiency in some phase of clinical dentistry. The course of study requires a minimum of two academic years; most students will require three years to complete the work. The applicant must be a graduate of an accredited school of dentistry and must have achieved, in both pre-dental and dental requirements, a superior scholastic record.

At the time of enrollment in the Graduate School, the student is assigned an appropriate faculty advisor, who works with the student in outlining a course of study consistent with objectives. This curriculum must cover the three areas of a selected phase of clinical dentistry, a related basic health science, and research.

Major and Minor

The major field of study must be selected from the following: dental biomaterials, endodontics, general dentistry, hospital dentistry, maxillofacial prosthetics, oral surgery, orthodontics, pediatric dentistry, periodontics, prosthodontics, public health dentistry, or dental radiology. Not less than 18 semester hours of credit in the program must be in the major subject, with the minimum acceptable grade being B. A minor must involve at least six semester hours of study in one or two basic health science departments related to the student's major and research interests.

By the time the student has been in residence one year and has finished some of both major and minor courses, the student and the advisor should recommend to the Graduate School dean at least two additional graduate faculty members, one from the minor area, for appointment to the graduate study committee. The student should discuss with this committee plans for the remaining course of study, including a proposed thesis title and outline of experimental design. Depending upon the nature of the research plan, it may be desirable for a different advisor to be appointed, serving either as co-chair or as new chair of the graduate study committee. At this time, demonstration of a reading knowledge of one foreign language, competence in biostatistics, experience with computer techniques, or other tools of research may be required, as appropriate to the student's investigation.

Admission to Candidacy

When the graduate study committee is satisfied that the student is prepared to undertake the research, the student is admitted to candidacy for the master's degree. This step should be taken at least three semesters before the anticipated date of completion of the program.

Research and Thesis

Sufficient research work to train the candidate in the principles and methods of scientific investigation is required. The research project should involve the student's own intensive work in some area of dentistry, preferably related to the basic health sciences. The thesis is based on the research study and must show the candidate's ability to delineate a problem, plan its solution, and present the results of the work in an orderly fashion. Familiarity with the literature of the field is expected.

Final Examination

The final oral examination is administered by the student's graduate study committee before the deadline is set by the Graduate School. The examination begins with oral presentation and defense of the thesis and may include any work fundamental thereto. At the close of the examination, the committee votes on the candidate, taking into account all of the work undertaken. Majority approval is required.

Additional Information

Deadline for Entry Term(s):	Consult Program Director for information
Deadline for All Application Materials to be in the Graduate School Office:	Variable
Number of Evaluation Forms Required:	Three
Entrance Tests	DDS (TOEFL and TWE also required for international applicants whose native language is not English.)

Contact Information

For detailed information, contact the graduate program director, Dr. Amjad Javed, University of Alabama School of Dentistry, School of Dentistry Building, SDB 714, 1919 Seventh Avenue South, Birmingham, AL 35294-0007.

Telephone 205-934-5407

Fax 205-934-0208

E-mail javeda@uab.edu

Web www.dental.uab.edu

Master of Science with Emphasis in Oral Biology

The School of Dentistry in collaboration with the joint basic science Departments at The University of Alabama School of Dentistry offers graduate studies leading to a Master of Science degree with emphasis in Oral Biology. The objective of the program is to relate basic biological sciences to health and disease of the oral cavity. This program is designed

for individuals holding a D.D.S., D.M.D., or B.S. in Science (e.g. biology, chemistry etc) with little or no experience in basic research. This program will provide insight into dental academics and teaching in basic or applied research.

Students are required to pursue studies in oral biology and in the basic biological sciences. These studies include course work, seminars, journal club, and a laboratory component. Course work includes formal lectures from within the School of Dentistry and courses offered by the basic sciences departments, School of Public Health and the School of Medicine. The seminars include the "Dean's Seminar Series" and the Institute of Oral Health Research seminars. The Seminars cover a wide array of topics relevant to various research areas as well as other disciplines of dentistry or dental education. A significant portion of the program is devoted to the design and completion of a thesis research project in the form of one publishable paper in a reputable scientific journal which is a requirement of the program. Thesis research will be carried out under the supervision of a faculty member. Faculty involved in the Master of Science program with emphasis in Oral Biology are actively engaged in research that represents a variety of oral and basic biomedical disciplines within the UAB. The diversity of the research interests offers opportunities for students to pursue studies in a stimulating research environment.

The program requires a minimum of 30 graduate credits. Of these, at least 24 credits must be selected from graduate-level courses approved for the program and a minimum of 6 credits at the master's research level. Each student must orally defend a master's thesis based on their research. If the applicant holds a D.D.S. or D.M.D. degree, the Master in Science may be combined with a clinical dental specialty training only after acceptance into the clinical program.

Admission

Applicants must hold a B.S., D.D.S., or D.M.D., or an equivalent degree and should possess a cumulative grade-point average of at least 3.00 on a 4.00 scale. Students whose first language is not English must earn a score of 560 or better on the Test of English as a Foreign Language (TOEFL).

Applicants are asked to submit a statement describing past research experience and current research interests, and stating how completion of the Master in Science program fits into their career goals.

For International applicant; transcripts and all related material should be received no later than **December 1** to enroll in the summer semester of the following year.

For US applicants; transcripts and all related material should be received no later than **April 15** to enroll in the summer semester of the same year.

Financial assistance is not available. Students must show that they can support themselves.

Contact

For further information and application materials, contact:

Jannet Katz, DDS, PhD
Professor
Department of Pediatric Dentistry

University of Alabama School of Dentistry
BBRB 713
1530 3rd Avenue South
Birmingham, AL 35294-2170
Telephone: (205) 934-2878
FAX: (205) 934-1426

e-mail: meow@uab.edu

Course Descriptions

Clinical Dentistry (CD)

Course credits in semester hours are to be arranged by consultation with the chair of the department involved. In general, courses in clinical dentistry may be expected to carry 3-6 hours of credit per semester. Course numbers marked with an asterisk indicate courses that may be repeated for credit.

*601. **Advanced Topics in Endodontics Seminar I.** Correlation of basic science and endodontics by literature review, lectures, seminars, demonstrations, presentations, and patient clinical treatments. Prerequisite: Permission of instructor. 3-6 hours.

*602. **Special Topics in General Dentistry.** 3-6 hours.

*603. **Special Topics in Oral and Maxillofacial Surgery.** Unique areas of surgical treatment in oral and maxillofacial surgery; orthognathic, TMJ, and facial reconstruction. 1-12 hours.

*604. **Special Topics in Orthodontics.** Diagnosis and treatment of orthodontic malocclusion in children, adolescents, and adults. 3-6 hours.

*605. **Special Topics in Pediatric Dentistry.** Areas affecting practice of pediatric dentistry, such as developing malocclusions, and their early diagnosis and management. 1-6 hours.

*606. **Special Topics in Periodontics.** Review of basic sciences and periodontics by special readings, lectures, seminars, and clinical instruction. Patient evaluation, treatment, planning, and therapeutic skills. 3-6 hours.

*607. **Removable Prosthodontics Seminar.** Current treatment modalities.

*608. **Special Topics in Radiology.** Lectures, seminars, and clinical instruction regarding intraoral and extraoral radiographic examinations. Technical and interpretation facets. 1-6 hours.

*609. **Special Topics in Fixed Prosthodontics.** Gnathological concepts and implantology.

610. **Introduction to Medical Genetics.** 3-6 hours.

*611. **Special Topics in Maxillofacial Prosthetics.** Application of biologic knowledge to planning treatment for restoration and reconstruction of special maxillofacial prosthetic patient. 1-3 hours.

*612. **Advanced Prosthodontics.** First-year clinic. Laboratory and clinical diagnosis, treatment planning, and care delivery, including implantology.

*613. **Special Topics in Hospital Dentistry.** Hospital protocol and procedures, medical emergencies in dental office, infection control, treating the medically compromised patient. 1-6 hours.

*614. **Periodontal Case Conferences.** 1-3 hours.

*615. **Periodontal Literature Review Seminar.** 1-3 hours.

*616. **Periodontal Board Topics.** 1-3 hours.

*620. **Clinical Pediatric Dentistry I.** 3-6 hours.

625. **Design and Analysis in Clinical Dental Research.** Basic statistical concepts, including terminology and appropriateness of study design and statistical tests. 1-4 hours.

626. **Surgical Implants in Dentistry.** Materials used for dental implants, design, fabrication, and tissue response to implants. 3-6 hours.

*627. **Biocompatibility Testing and Biodegradation Phenomena.** Degradation of materials in body, effect of ion release to tissues, tests for biocompatibility.

*628. **Enamel Properties, Acid Etching, and Adhesion.** Properties of enamel and dentin, acid-etching techniques, principles of adhesion, dentin bonding agents. 4 hours.

*629. **Ceramic Materials in Dentistry.** Basic science of ceramic materials, porcelain, cements, gypsum, investments, and ceramic implant materials.

*630. **Clinical Biomaterials Research Methods.** Design of studies for clinical evaluation of biomaterials, clinical test methods, and correlation of laboratory results.

*631. **Polymeric Biomaterials.** Basic science of polymers, acrylics, waxes, composite resins, impression materials, and polymeric implant materials.

*632. **Seminar in Biomaterials.** Review of biomaterials literature. 1 hour.

*633. **Alloy Systems in Dentistry.** Basic science of metals, noble and base metals and alloys, amalgam, metallic implants.

*634. **Craniofacial Genetics.** Craniofacial findings in children with genetic disorders; dental features and other physical abnormalities associated with such disorders.

*635. **Pediatric Dentistry Journal Club.** 2 hours.

*636. **Hospital Dentistry.** Aspects of general anesthesia for pediatric and handicapped patients, including laboratory tests, indications for general anesthesia, etc. 2 hours.

*637. **Growth and Development-Genetics.** Mechanisms and control of craniofacial growth, both normal and aberrant; background in genetics.

638. **Current Topics In Dentistry.** Fixed and removable prosthetics, restorative techniques, endodontics, periodontics, practice management. 1 hour.

639. **Dental Management of the Medically Compromised Patient.** Treatment modifications for the medically compromised patient; heart disease, diabetes, renal disease, organ transplantation, antibiotic protocols. Summer.

*640. **Physical Diagnosis.** Basic principles of physical examination.

*650. **Advanced Topics in Hospital Dentistry.** Dealing with medically complex patient; anesthesia and sedation techniques; dental care of hospitalized patient. 1-6 hours.

651. **Advanced Topics in Endodontics Seminar II.** Readings, lectures, seminars, and clinical instruction in surgical therapies, trauma, and resorption of roots; fundamental research techniques. Prerequisite: CD 601. 3-6 hours.

*652. **Advanced Topics in General Dentistry.** 3-6 hours.

*653. **Advanced Topics in Oral and Maxillofacial Surgery.** 3-6 hours.

*654. **Advanced Topics in Orthodontics.** Diagnosis and treatment planning of complex orthodontic malocclusions including orthognathic surgical problems, craniofacial malformations, and temporomandibular joint dysfunction. This includes didactic and clinical programs. 3-6 hours.

*655. **Advanced Topics in Pediatric Dentistry.** Individually selected topics researched and presented in manuscript form at end of semester. 1-6 hours.

*656. **Advanced Topics in Periodontics.** Special readings, seminars, lectures, and clinical instruction in advanced clinical procedures and clinical research techniques. Prerequisite: CD 606. 3-6 hours.

*657. **Advanced Clinical Prosthodontics.** (Continuation of CD 612). Emphasis on full-mouth rehabilitation and implantology. Prerequisite: CD 612.

*658. **Advanced Topics in Radiology.** Advanced imaging systems; radiographic procedures. 1-12 hours.

*659. **Advanced Topics in Fixed Prosthodontics.** Total patient care; emphasis on implantology and rehabilitation. Prerequisite: CD 609.

*660. **Advanced Topics in Maxillofacial Prosthetics.** Principles of maxillofacial prosthetics; technical procedures and material; mechanical testing and laboratory evaluation of materials.

*661. **Physical Properties of Biomaterials.** Physical and chemical properties of metallic, ceramic, and polymeric materials; mechanical testing and laboratory evaluation of materials.

*662. **Laboratory Methods for Biomaterials Research.** Dental casting methods, metallography, hardness and mechanical properties testing, corrosion and surface testing, design of laboratory and clinical experiments, photography, use of light and scanning electron microscopes.

*663. **Diagnosis and Screening Procedures in Dentistry.**

*664. **Grand Rounds in Pediatric Dentistry.** 2-3 hours.

665. **Maxillofacial Seminar.**

*666. **Clinical Maxillofacial Prosthetics.** Prosthetic rehabilitation of patients with deficient maxillofacial system. 1-3 hours.

667. **Selected Topics in Anatomy of Head and Neck.**

*668. **Advanced Oral Histopathology.**

*669. **Clinical Pediatric Dentistry II.**

*670. **Microcomputer Applications in Dental Research, Public Health Dentistry, and Clinical Dentistry.** Use of microcomputers, different types of software; application to specific research, clinical, public health, and practice management procedures.

*671. **Special Topics in Microcomputer.**

*672. **Advanced Topics in OMS.** 5 hours.

*673. **Special Topics in OMS Trauma.** 4 hours.

*674. **Advanced Topics in OMS-Orthognathic.** 4 hours.

*675. **Special Topics in OMS Patient Care.** 4 hours.

*676. **Advanced Topics in OMS Oral Pathology.** 4 hours.

*679. **Fundamentals of Pediatric Dentistry.** Topics include operative dentistry, physical therapy, preventive orthodontics. 1-6 hours.

*680. **Dental Clinical Pathology.**

*681. **Clinical Pediatric Dentistry III.**

*682. **Special Topics in Endodontics.**

*685. **Advanced Endodontics.** First-Year Clinic.

- *686. **Advanced Endodontics.** Second-Year Clinic.
- *688. **Special Pathology.**
- *689. **Conscious Sedation.**
- *690. **Physiology and Concepts of Occlusion.**
- *691. **Special Topics in Biomaterials Science.** 1-6 hours.
- *692. **Advanced Prosthodontic Seminar.** Current and historical prosthodontic literature.
- *693. **Special Topics in OMS.** 5 hours.
- *694. **Advanced General Dentistry Seminars (I-IV).** Diagnosis, treatment planning and case management; patient and practice management; quality assurance; instruction and advanced clinical procedures; comprehensive case presentations. 1 hour.
- *695. **Literature Review in Pediatric Dentistry.**
- *698. **Nonthesis Research.** 1-6 hours.
- *699. **Thesis Research.** Prerequisite: Admission to candidacy. 1-6 hours.

Oral Biology (OB)

Unless otherwise noted, all courses are for 3 semester hours of credit.

600. **Graduate Cariology.** Comprehensive survey of the state of the science in the management, etiology and prevention of dental caries from an infectious disease perspective. Modern methods in molecular epidemiology and molecular biology are integral to the course. Winter.

602. **Pharmacology and Therapeutics for Dentistry.** Current knowledge in pharmacological issues related to dentistry. Spring.

603. **Oral Inflammation and Periodontal Disease.** Understanding the immunological aspects of periodontal disease. Winter

607. **Prenatal craniofacial growth and Development**

608. **Special Topics in Oral Biology**

611. **Saliva: Composition and Function.** Physiology, biochemistry, and function of saliva in relation to oral health and as a diagnostic fluid. Spring.

616. **Postgraduate Oral Histology.**

620. **Oral Microbiology and Immunology.** Microbiological and molecular aspects of infectious diseases that impact the oral cavity including dental caries, periodontal disease, hepatitis, AIDS and various oral infections. Winter.

622. **Biochemistry of Connective Tissue and Bone.** Biology, chemistry and function of connective tissue elements. Methods and approaches to research. Fall.

625. **Current Issues in Nutrition and Oral Health.**

627. **Surgical Implants in Dentistry.** Basic aspects of dental implant-based treatment modalities. Spring.

630. **Introduction to Clinical Trials/Epidemiology.**

631. **Ethics in Biological Research.**

632. **Special Topics on Mucosal Immunology.**

633. **Research Design Methodology.**

657. **Prenatal Craniofacial Growth and Development.**

663. **Saliva as a Diagnostic Fluid.** Comprehensive knowledge about planning, performing, and interpreting results of saliva analyses. Fall

687. **Oral Immunobiology and Vaccine Development.** Comprehensive knowledge of immune responses and "state of the art" mucosal vaccine development and their protection of oral/mucosal infectious diseases.

698. **Non-Thesis Research.**

699. **Thesis Research.** Prerequisite: Admission to candidacy

Last modified 06/26/09