

ENDODONTICS CERTIFICATE

Overview

The Advanced Education Program in Endodontics is a 24-month certificate program of intensive study, research and clinical activity designed to meet the formal requirements for eligibility to take the certifying examination of the American Board of Endodontics. Following admission to the certificate program, students have the option to apply for the M.S. in Dental Science Program (36-month). Prior to the student's graduation, dental research results are expected to be formally written in publishable format and submitted for publication in a refereed scientific journal, and a variety of five clinical cases must be submitted in the American Board of Endodontics format.

Admissions Requirements

- ADEA PASS application
- Official transcripts from all schools attended. This includes trade schools, community colleges and universities.
- Official evaluation of dental school transcripts for all international applicants.
- Passing National Board Part 1 or Passing INBDE exam scores.
- All Non-US/Canadian ADA/CODA accredited school applicants, TOEFL exam scores.
- Three professional evaluations, submitted to PASS
- Institution evaluation, submitted to PASS

Degree Requirements

Students must complete all course work consisting of 91 total program hours with a minimum of a 3.0 GPA, complete a research project and complete a portfolio of five treatment cases to be submitted to the American Board of Endodontics.

The M.S. in Dental Science degree will be awarded to students who successfully complete the certificate and the required courses (<http://catalog.uthscsa.edu/biomedicalsciences/dentalscience/endodontics/>) in the Graduate School.

Sample Plan of Study

First Year

Fall		Credit Hours
ENDO 5015	Dental Photography	0.5
ENDO 5073	Literature Review 1	5
ENDO 5080	Case Presentations 1	4.5
ENDO 6075	Current Literature Review	1.5
DIAG 5050	Fundamentals of Dental Radiography	1
ENDO 5010	Clinical Endodontics 1	2.5
ENDO 5017	Clinical Seminar 1	2
PATH 5035	Oral Pathology	2
PERI 5052	Surgical Anatomy	1
PROS 5050	Dental Implantology	1
ENDO 5020	Introduction to Advanced Endodontics ¹	2.5
INTD 5013	Perio/Pros/Endo/Orth Interdisciplinary Course ¹	1
MSDS 5020	Dental Biomed Core 1 ¹	4

MSDS 5121	Biostatistics ¹	1
MSDS 5090	Grad Research Methodology ¹	2
ENDO 5071	Supervised Teaching	1
Spring		
ENDO 5011	Clinical Endodontics 1	3
ENDO 5018	Clinical Seminar 1	2
ENDO 5075	Literature Review 1	4
ENDO 5082	Case Presentations 1	4
ENDO 5052	Endodontic Surgical Anatomy ¹	1.5
ENDO 6077	Current Literature Review ¹	1
INTD 5013	Perio/Pros/Endo/Orth Interdisciplinary Course ¹	1
MSDS 5021	Dental Biomed Core 2 ¹	1
Total Credit Hours:		50.0

Second Year

Fall		Credit Hours
ENDO 6010	Clinical Endodontics 2	6
ENDO 6073	Literature Review 2	5
ENDO 6075	Current Literature Review	1.5
ENDO 6083	Case Presentations 2	1
INTD 6019	Pharmacotherapeutics	1
ENDO 6084	Case Presentations 2	4
INTD 6014	Perio/Pros/Endo/Orth Interdisciplinary Course ²	1
ENDO 6071	Supervised Teaching	1
Spring		
ENDO 6012	Clinical Endodontics 2	5
ENDO 6077	Current Literature Review	1
ENDO 6060	Pulp Biology and Pain Pharmacology	1.5
ENDO 6078	Literature Review	4
ENDO 6085	Case Presentations 2	4
INTD 6014	Perio/Pros/Endo/Orth Interdisciplinary Course ²	1
ENDO 6080	Focused Regendo Research	4
Total Credit Hours:		41.0

¹ This course is shared with the certificate and the M.S. Dental Science.

Objectives/Program Outcomes

Goals

Consistent with the Health Science Center mission and with the Standards for Advanced Specialty Education Programs in Endodontics, the program goals are to provide each student with an excellent, individualized educational experience in four areas: 1) biomedical sciences, 2) clinical sciences, 3) teaching, 4) research and to ultimately prepare each student to achieve certification by the American Board of Endodontics.

Objectives

The objectives of the program are to provide instruction and/or clinical experience in the following areas:

1. Biomedical sciences
 - a. Anatomy and histology, including embryology
 - b. Microbiology, infection and immunology
 - c. Oral medicine and pathology
 - d. Biochemistry and physiology
 - e. Pharmacology
2. Clinical sciences
 - a. Patient evaluation and management, including emergencies
 - b. Endodontic radiology, diagnosis and treatment plans
 - c. Pain and infection, including pharmacologic management
 - d. Nonsurgical and surgical endodontic procedures
 - e. Restoration of endodontically treated teeth
 - f. Evaluation of endodontic therapy
 - g. Practice management
3. Teaching endodontics
 - a. Presentations in lectures, seminars and table clinic
 - b. Preclinical instruction of undergraduate students
 - c. Clinical instruction of undergraduate students
4. Research
 - a. Statistics, research design and methodology
 - b. Investigation and evaluation of the literature
 - c. Written and oral presentation of research results

The curriculum of instruction and experience in biomedical and clinical sciences is well balanced with teaching and research experience.

The ultimate objective of the program is to develop students who are well prepared for candidacy for certification by the American Board of Endodontics and for continued career progress in clinical practice or academic achievement.

Courses

DIAG 5007. Graduate OMR Clinic. 3 Credit Hours.

The Graduate Radiology Clinic is in operation five full days per week. Services include intra- and extra-oral radiography, panoramic, cephalometric, linear, and multi-directional tomography; sialography; arthrography; CT image processing; and planned CT image acquisition.

DIAG 5015. Panoramic Radiology. 1 Credit Hour.

This lecture course includes topics such as the principles of panoramic radiology, concepts of panoramic image formation, review of anatomic structures, clinical techniques, and recognition and correction of panoramic errors. Also, the uses and limitations of panoramic radiology as well as digital panoramic radiology will be discussed. The goal is to achieve competency in this subject matter. Proficiency will be achieved during clinical rotations in panoramic radiology as part of the graduate OMR clinic experience.

DIAG 5016. Head & Neck Anatomy. 1 Credit Hour.

This review course is designed to provide the resident with the opportunity to acquire an anatomical foundation for oral and maxillofacial radiology. The course uses interactive computer-based head and neck clinical anatomy software as well as digital libraries of radiographic and cross-sectional anatomical specimens. Numerous Internet-based references are also used to provide the student with the most up-to-date and graphic information. Clinical anatomic information is correlated with plain film, CT, and MRI images to provide a contextual reference between clinical and radiographic anatomy. Written and oral examinations are given to assess competency in this area.

DIAG 5017. Literature Review. 1 Credit Hour.

Each week a topic in Oral and Maxillofacial radiology is discussed. In addition, students receive a block of instruction in evidence-based literature evaluation. At each session a student leader presents from 2-4 papers that meet the current topic. Articles are approved by the course director beforehand for scientific accuracy, validity, and relevance. Students are expected to read the articles before the session and participate in the group discussion. Discussion is facilitated by a question and response format led by the course director. Literature from past reviews is filed for student reference.

DIAG 5018. Practicum In Oral Medicine. 4 Credit Hours.

Practice in clinical skills required for diagnosis, management, and treatment of oral and perioral diseases, including such special procedures as sialography, cytological smearing, biopsy, and culture taking is offered. A comprehensive review of the conditions that the dentist may be called upon to diagnose and treat as the result of the physical examination of the patient is the focus of this course. Topics include extraoral findings such as general appearance of the hands, eyes, ears, nose and neck; intraoral findings such as lesions as in lip swelling or palatal swelling; and color changes, surface changes, and other problems such as pain and functional disorders.

DIAG 5026. Diagnostic Imaging Of The Jaws. 4 Credit Hours.

The goal of this class is to achieve competency regarding the interpretation of plain and advanced images of hard and soft tissue conditions affecting the teeth, jaws, and surrounding structures of the maxillofacial complex including, but not limited to, the paranasal sinuses, salivary glands, and trauma. The material is presented and repeated through three basic formats: by pattern recognition, by disease process, and as further analyzed using contrast studies, CT, MR, nuclear scans, and ultrasound images where applicable. This course forms the basis for more advanced seminar and clinical courses through which proficiency is required to be achieved.

DIAG 5037. Oral And Maxillofacial Radiology Interpretation 1. 1 Credit Hour.

The overall purpose of this course is to provide students with learning experiences that will give them the opportunity to develop proficiency in OMR image analysis and interpretation. This course meets in one-hour sessions with a seminar or grand rounds format. Each week, students receive cases and are requested to generate a written report and present the case to other students and faculty. Cases include a variety of diagnoses that comprise the field of oral and maxillofacial radiology including both typical and unusual examples. Additionally, high-quality, properly exposed images are supplied. Many examples include plain film, CT, and MR for the same case. Additional cases include other imaging modalities such as tomograms, contrast studies, and nuclear scans. In some instances, glass slides and a microscope are used to correlate histological features with MR images, an activity much requested by students. Imaging particular to salivary gland disease and TMJ disorders will also be emphasized. Students will record these cases in a special section of their logbook and may, circumstances permitting, copy the cases for future reference or teaching. The course director's collection of cases is one of the most extensive and is broadly representative and thus guarantees the student exposure to a variety of clinical cases which cannot be assured through the various clinical experiences during the time frame of the program.

DIAG 5040. Basic Principles Of Oral And Maxillofacial Imaging. 2 Credit Hours.

This is a didactic and clinical course aimed at providing oral and maxillofacial radiology residents with basic knowledge of oral and maxillofacial radiographic anatomy and helps the residents develop proficiency in routine and special OMF imaging procedures. The course consists of a complete review of plain film techniques used in OMF radiography and hands-on imaging exercises with radiographic phantoms. The radiographic anatomy displayed on these projections will be reviewed in lecture and exercise format using the practice phantom films and radiographic anatomy review sets. Boney anatomy and organ-based anatomy will be reviewed.

DIAG 5045. Radiation Physics. 3 Credit Hours.

This course presents the fundamental principles of radiation physics as they apply to medical and dental diagnostic radiology. Topics include the nature and production of X-rays, interactions of X-rays with matter, the physics of films and intensifying screens, the nature of the radiographic image, fundamentals of radiation dosimetry and protection, principles of tomography, and panoramic radiography. Topics also include computed tomography, particulate radiation and nuclear medicine, ultrasound, and digital image receptors and displays. Laboratory sessions provide a wide range of experience in institutional trainings and a course capstone project.

DIAG 5050. Fundamentals of Dental Radiography. 1 Credit Hour.

This lecture course reviews the basics of diagnostic radiography and introduces the latest techniques. Review includes sessions on exposure factors, projection techniques, film processing, and radiation protection. The major extraoral technique stressed in the course is panoramic radiography, including normal anatomy, technique errors, and interpretation. Skull projections are reviewed and basic principles and indications of special techniques such as xeroradiography, CT, nuclear medicine, and others are presented as time allows.

DIAG 5070. Supervised Teaching. 1 Credit Hour.

Graduate students are assigned to the various clinics, laboratories, and classes for the opportunity to acquire experience in teaching undergraduate students in a variety of situations. Supervision and evaluation of teaching performance is provided by the graduate faculty.

DIAG 5091. Case Conference. 1 Credit Hour.

This course meets weekly and serves as a venue for students to plan and present their cases to other students and faculty, and supply follow-up information where feasible.

DIAG 5092. Diag Science Seminar. 1 Credit Hour.

The format of this course includes presentations, reviews, and discussions of current cases from the Dental Diagnostic Science Clinic as well as cases of interest from the teaching file.

DIAG 5093. Diag Science Seminar. 1 Credit Hour.

The format of this course includes presentations, reviews, and discussions of current cases from the Dental Diagnostic Science Clinic as well as cases of interest from the teaching file.

DIAG 6005. Clinical Path Conference. 1 Credit Hour.

Formal review of clinical, radiographic, and histopathologic presentations of various conditions affecting the head and neck area and the oral cavity, in particular, is presented. A variety of cases are presented for group discussion with a view toward obtaining a differential diagnosis.

DIAG 6007. Graduate Oral And Maxillofacial Clinic. 3 Credit Hours.

The Graduate Radiology Clinic is in operation five full days per week. Services include intra- and extra-oral radiography, panoramic, cephalometric, linear, and multi-directional tomography; sialography; arthrography; CT image processing; and planned CT image acquisition.

DIAG 6008. Orofacial Pain. 2 Credit Hours.

This course is designed to introduce the student to the field of orofacial pain. The course objectives include: introduction to orofacial pain, assessment of orofacial pain disorders, diagnostic classification of orofacial pain disorders, differential diagnosis and management of vascular intracranial disorders, differential diagnosis and management of neuralgias, nerve trunk pain and deafferentation pain, differential diagnosis and management of intraoral pain, differential diagnosis and management of temporomandibular disorders, and differential diagnosis and management of mental disorders.

DIAG 6009. Noninfectious Diseases/Oral Mucosa. 2 Credit Hours.

This course is designed to discuss a selected group of diseases of the oral mucosa with the primary purpose of presenting diagnostic and therapeutic guidelines. The role of oral medicine specialists in the care of noninfectious oral mucosal diseases, appropriate (e.g., timely and accurate) consultations/referral, definitive therapy, clinical review (e.g., the disease and/or side-effects of therapy), disease prevention, and counseling of patients and relatives will be discussed.

DIAG 6017. Literature Review. 1 Credit Hour.

Each week a topic in Oral and Maxillofacial radiology is discussed. In addition, students receive a block of instruction in evidence-based literature evaluation. At each session, a student leader presents from 2-4 papers that meet the current topic. Articles are approved beforehand by the course director, for scientific accuracy, validity, and relevance. Students are expected to read the articles before the session and participate in the group discussion. Discussion is facilitated by a question and response format led by the course director. Literature from past reviews is filed for student reference.

DIAG 6018. OMR Case Conference. 1 Credit Hour.

This course meets weekly and serves as a venue for students to plan and present their cases to other students and faculty, and supply follow-up information where feasible.

DIAG 6019. Chemosensory Disorders/Salivary GI Dysfunctions. 2 Credit Hours.

Chemosensory disorders affect in particular disproportionately a large segment of the elderly population, the fastest growing segment of the western industrialized nation. Also saliva plays a major role in the preservation and protection of the oral and pharyngeal tissues. When salivary gland function is altered, multiple stomatologic and systemic disorders can develop. This graduate level elective course is designed to make the graduate student (oral medicine) aware of the etiology, prevalence and mechanisms of normal and diseased chemosensation and salivary gland functions of the oral cavity. Its focus will be on the diagnosis and management of patients with taste, smell and salivary gland dysfunctions.

DIAG 6020. Tumor Board. 1 Credit Hour.

The class meets for one hour once a week at the MARC building and is sponsored by the Department of Otolaryngology and Head and Neck Surgery. Students will have the opportunity to learn case management and prognosis of patients with oral and maxillofacial and head and neck tumors, exposure to the diagnostic imaging work-up of the patients presented, interact with attending medical and dental specialists, attend special seminars related to tumor board, and have an opportunity to interact with various medical residents for further learning opportunities. Students are expected to share some of their learning experiences and present cases during case conferences to other OMR program venues such as graduate clinic.

DIAG 6021. Medical Radiology Rotation. 2 Credit Hours.

Medical radiology training occurs within the dental school using image-acquired data from a medical clinic. It also occurs in the University Hospital, at Wilford Hall Medical Center at nearby Lackland Air Force Base, and in a private radiology clinic. Cases using advanced imaging are available in the program director's extensive collection to further enhance medical radiology training. A minimum of 7.5 semester credit hours are required. Each student must enroll in a minimum of three one-month rotations.

DIAG 6022. Practicum In Oral Medicine. 6 Credit Hours.

Practice in clinical skills required for diagnosis, management, and treatment of oral and perioral diseases, including such special procedures as sialography, cytological smearing, biopsy, and culture taking is offered. The focus of this course is a comprehensive review of the conditions that the dentist may be called upon to diagnose and treat as the result of the physical examination of the patient. Topics include extraoral findings such as general appearance of the hands, eyes, ears, nose and neck; intraoral findings such as lesions in lip swelling or palatal swelling; and color changes, surface changes, and other problems such as pain and functional disorders.

DIAG 6025. Diagnostic Imaging Of The Head And Neck. 4 Credit Hours.

The goal of this course is to achieve competency regarding the interpretation of plain and advanced images of hard- and soft-tissue conditions affecting the teeth, jaws and surrounding structures of the maxillofacial complex including, but not limited to, the paranasal sinuses, salivary glands, and trauma. The material is presented and repeated through three basic formats: by pattern recognition, by disease process, and as further analyzed using contrast studies, CT, MR, nuclear scans and ultrasound images where applicable. This course forms the basis for more advanced seminar and clinical courses through which proficiency is required to be achieved.

DIAG 6027. Advanced Imaging Technology. 3 Credit Hours.

This class will provide oral and maxillofacial radiology residents with proficiency level understanding of the physical principles of all the advanced imaging methods and techniques such as computed tomography, magnetic resonance imaging, ultrasounds, and radionuclide imaging commonly used in medical care, and understand the clinical applications of these advanced imaging modalities. This will also cover the fundamental basis for digital imaging, image enhancement and restoration, image analysis, image compression, image synthesis and image displacement.

DIAG 6041. Radiation Biology. 2 Credit Hours.

An introductory course in the basic concepts of radiation biology, this course is appropriate for dentists desiring an opportunity to gain additional knowledge of the biological effects of diagnostic and therapeutic levels of x-radiation. Concepts of designing an office for optimum radiation protection also are presented.

DIAG 6043. Advanced Radiation Biology. 1 Credit Hour.

An in-depth study of radiation biology is presented, emphasizing such topics as radiation risk, dosimetry, theories of radiation damage, radiation hygiene and protection, and the effects of therapeutic levels of radiation on the oral tissues.

DIAG 6049. Oral And Maxillofacial Radiology Interpretation 2. 1 Credit Hour.

The overall purpose of this course is to provide students with learning experiences that will give them the opportunity to develop proficiency in OMR image analysis and interpretation. This course meets in one-hour sessions with a seminar or grand rounds format. Each week, students receive cases and are requested to generate a written report and present the case to other students and faculty. Cases include a variety of diagnoses that comprise the field of oral and maxillofacial radiology including both typical and unusual examples. Additionally, high-quality, properly exposed images are supplied. Many examples include plain film, CT, and MR for the same case. Additional cases include other imaging modalities such as tomograms, contrast studies, and nuclear scans. In some instances, glass slides and a microscope are used to correlate histological features with MR images, an activity much requested by students. Imaging particular to salivary gland disease and TMJ disorders will also be emphasized. Students will record these cases in a special section of their logbook and may, circumstances permitting, copy the cases for future reference or teaching. The course director's collection of cases is one of the most extensive and is broadly representative and thus guarantees the student exposure to a variety of clinical cases which cannot be assured through the various clinical experiences during the time frame of the program.

DIAG 6051. Oral And Maxillofacial Radiology Interpretation 3. 1 Credit Hour.

The overall purpose of this course is to provide students with learning experiences that will give them the opportunity to develop proficiency in OMR image analysis and interpretation. Students receive cases and are requested to generate a written report and present the case to other students and faculty. Cases include a variety of diagnoses that comprise the field of oral and maxillofacial radiology including both typical and unusual examples. Additionally, high-quality, properly exposed images are supplied. Many examples include plain film, CT, and MR for the same case. Additional cases include other imaging modalities such as tomograms, contrast studies, and nuclear scans. In some instances, glass slides and a microscope are used to correlate histological features with MR images, an activity much requested by students. Imaging particular to salivary gland disease and TMJ disorders will also be emphasized. Students will record these cases in a special section of their logbook and may, circumstances permitting, copy the cases for future reference or teaching. The course director's collection of cases is one of the most extensive and is broadly representative and thus guarantees the student exposure to a variety of clinical cases which cannot be assured through the various clinical experiences during the time frame of the program.

DIAG 6052. Case Conference 3. 1 Credit Hour.

Oral and Maxillofacial radiology resident will plan and present an assigned case to other students and faculty and provide follow up information where feasible. It will enhance the residents ability to write and present accurate case reports; teaches the ability to plan a case, and interact with the referring practitioner, and enhance their ability to recognize imaging characteristics of a disease or condition.

DIAG 6071. Supervised Teaching. 1 Credit Hour.

Graduate students are assigned to the various clinics, laboratories, and classes for the opportunity to acquire experience in teaching undergraduate students in a variety of situations. Supervision and evaluation of teaching performance are provided by the graduate faculty.

DIAG 6078. Literature Review 3. 1 Credit Hour.

During this course, oral and maxillofacial radiology residents will review the principles of evidence based medicine and learn how it applies to reviewing scientific articles. At each class session, a student will present articles from the current or classic radiology literature including radiation safety, periodontal disease, CT, systemic disease, digital imaging, endodontic disease, MRI, implants, bite-wings, tomography, developmental disorders, selection criteria, panoramic radiology, sectional criteria, trauma, forensics, inflammation, QARM, Caries, TMJ, tumors and biomedical modeling. Prerequisites: DIAG 6017.

DIAG 6079. Graduate OMR Clinic 3. 3 Credit Hours.

The Graduate Radiology Clinic operates 4.5 days per week and provides opportunities for oral and maxillofacial radiology residents to develop skills in intra- and extra oral radiography, panoramic, cephalometric, linear and multi-directional tomography, sialography, arthrography, and CT imaging processing and planned CT image acquisition. Prerequisites: DIAG 6007.

DIAG 6091. Diagnostic Science Seminar. 1 Credit Hour.

The format of this course includes presentations, reviews, and discussions of current cases from the Dental Diagnostic Science Clinic as well as cases of interest from the teaching file.

DIAG 6135. Clinical Case Conference. 1 Credit Hour.

Each student will be assigned one or more cases to cover in a written report and to present in conference. Over two semesters, weekly conferences will allow for a large variety of representative pathoses to be reviewed and discussed. Students will have the opportunity to correlate the historical, clinical, and radiographic findings in the formation of a differential diagnosis or a diagnostic impression.

DIAG 7036. Radiographic Interpretation. 1 Credit Hour.

This is a comprehensive didactic course in dental radiologic interpretation of diseases of the jaws including differential radiological diagnosis of developmental abnormalities and pathological lesions of the teeth and jaws.

DIAG 7052. Geriatrics. 1.5 Credit Hour.

Lectures and seminars emphasizing dental management of the geriatric patient cover such topics as normal aging, treatment planning, pharmacologic considerations, management and communication techniques, dementias, dentistry for nursing home and homebound elderly, and clinical care.

DIAG 7055. Oral Medicine. 2.5 Credit Hours.

Lectures, demonstrations, and visual aids present the fundamentals of diagnosis and treatment in general medicine and surgery as they relate to dentistry. Students have the opportunity to demonstrate skill in physical diagnosis in laboratory sessions.

Courses

ENDO 5010. Clinical Endodontics 1. 2.5 Credit Hours.

An extensive clinical experience in the broad spectrum of endodontic practice is offered on the graduate level. Each student has the opportunity to maintain a comprehensive endodontic practice under the supervision of the director and staff of the postdoctoral program in endodontics.

ENDO 5011. Clinical Endodontics 1. 3 Credit Hours.

An extensive clinical experience in the broad spectrum of endodontic practice is offered on the graduate level. Each student has the opportunity to maintain a comprehensive endodontic practice under the supervision of the director and staff of the postdoctoral program in endodontics.

ENDO 5015. Dental Photography. 0.5 Credit Hours.

This course is designed to expose the student to the principles of effective dental photography. Students are given the opportunity to make clinical photographs that are critiqued in class.

ENDO 5017. Clinical Seminar 1. 2 Credit Hours.

These seminars provide the opportunity to discuss matters pertaining to clinical endodontics by exposing the student to a wide variety of clinical cases. The seminars provide information to give students the opportunity to become sophisticated diagnosticians and skillful clinicians. Students are provided the opportunity to achieve these goals through student case presentations, faculty case presentations, topical lectures by faculty and consultant visits.

ENDO 5018. Clinical Seminar 1. 2 Credit Hours.

These seminars provide the opportunity to discuss matters pertaining to clinical endodontics by exposing the student to a wide variety of clinical cases. The seminars provide information to give students the opportunity to become sophisticated diagnosticians and skillful clinicians. Students are provided the opportunity to achieve these goals through student case presentations, faculty case presentations, topical lectures by faculty, and consultant visits.

ENDO 5020. Introduction to Advanced Endodontics. 2.5 Credit Hours.

This course is a laboratory and lecture review of endodontic concepts and techniques starting at the basic level and progressing to the advanced. Various techniques of access preparation, chemomechanical canal preparation and obturation will be taught. Students will have an opportunity to prepare and obturate the root canal system using a variety of techniques and materials. Procedures are performed under simulated clinical conditions in a mannequin. Following completion of obturation, students dissect and photograph tooth roots under a dissecting microscope to evaluate the effectiveness of the various canal preparation and obturation techniques.

ENDO 5052. Endodontic Surgical Anatomy. 1.5 Credit Hour.

This course consists of a series of four four-hour seminar sessions devoted to an in-depth discussion of endodontic surgical anatomy, surgical indications and techniques, and wound healing. This is followed by twenty hours of laboratory during which students practice actual surgical procedures on anterior, premolar and molar teeth in teeth mounted on manikins using contemporary endodontic microsurgery techniques. Emphasis is given to the correct use of the surgical microscope for these procedures and adequate management of soft and hard tissues.

ENDO 5060. Current Concepts In Endo. 1 Credit Hour.

Modern thoughts and concepts in endodontics will cover diagnosis, the dental pulp and periapex, pulpalgia and referred pain; vital pulp therapy; treatment of the acute apical abscess, cellulitides, restorative considerations for the endodontically treated tooth, endodontic surgery, and the cracked tooth. Other topics include avulsions, endodontic-periodontic interrelationships, current concepts in endodontics and an overview of endodontic research.

ENDO 5071. Supervised Teaching. 1 Credit Hour.

The goal of this course is to teach the student how to be an effective teacher. This course involves the student in teaching a sophomore lecture and laboratory course where dental students receive their initial exposure to endodontics. The student is given the opportunity to be actively involved in laboratory supervision of a small group of sophomore students as they perform specific endodontic procedures on extracted teeth. The student functions as an instructor side by side with endodontic faculty members who observe and critique the student's performance.

ENDO 5073. Literature Review 1. 5 Credit Hours.

This course is designed to familiarize the student with pertinent articles, both topical and current, related to endodontics. The articles, selected from the dental, medical and basic science literature, are assigned to the student to critically abstract and evaluate for research design, findings and conclusions.

ENDO 5075. Literature Review 1. 4 Credit Hours.

This course is designed to familiarize the student with pertinent articles, both topical and current, related to endodontics. The articles, selected from the dental, medical and basic science literature, are assigned to the student to critically abstract and evaluate for research design, findings and conclusions.

ENDO 5080. Case Presentations 1. 4.5 Credit Hours.

This course is designed to provide faculty evaluation of endodontic cases treated by students. Critical evaluation will be made of the diagnosis, treatment plan and treatment methodology. Differential diagnosis will be considered along with alternate treatment plans and treatment methods. Reasons for any complications will be determined, and methods for preventing them will be discussed. The need for post-treatment follow-up examinations will be determined. The positive feedback provided by these courses is intended to increase student confidence and competence.

ENDO 5082. Case Presentations 1. 4 Credit Hours.

This course is designed to provide faculty evaluation of endodontic cases treated by students. Critical evaluation will be made of the diagnosis, treatment plan and treatment methodology. Differential diagnosis will be considered along with alternate treatment plans and treatment methods. Reasons for any complications will be determined, and methods for preventing them will be discussed. The need for post-treatment follow-up examinations will be determined. The positive feedback provided by these courses is intended to increase student confidence and competence.

ENDO 5095. Research. 6 Credit Hours.

The course requires the student to formulate a protocol for the purpose of conducting an original investigation. Once the protocol is critically evaluated and accepted, students, under the guidance of a mentor, conduct a research project suitable for publication. The completed research paper is presented to the Endodontics Department research Committee, staff and guests for evaluation and critique.

ENDO 5096. Research. 6 Credit Hours.

The course requires the student to formulate a protocol for the purpose of conducting an original investigation. Following a critical evaluation and acceptance of the protocol, the student conducts a research project, suitable for publication, under the guidance of a mentor. The completed research paper is presented to the Endodontics Department Research Committee, staff and guests for evaluation and critique.

ENDO 5097. Research. 2 Credit Hours.

The course requires the student to formulate a protocol for the purpose of conducting an original investigation. Following a critical evaluation and acceptance of the protocol, the student conducts a research project, suitable for publication, under the guidance of a mentor. The completed research paper is presented to the Endodontics Department Research Committee, staff and guests for evaluation and critique.

ENDO 5098. Research. 2 Credit Hours.

The course requires the student to formulate a protocol for the purpose of conducting an original investigation. Following a critical evaluation and acceptance of the protocol, the student conducts a research project, suitable for publication, under the guidance of a mentor. The completed research paper is presented to the Endodontics Department Research Committee, staff and guests for evaluation and critique.

ENDO 6000. Introduction to Advanced Endodontics for Interns. 1 Credit Hour.**ENDO 6010. Clinical Endodontics 2. 6 Credit Hours.**

An extensive clinical experience in the broad spectrum of endodontic practice is offered on the graduate level. Each student has the opportunity to maintain a comprehensive endodontic practice under the supervision of the director and staff of the postdoctoral program in endodontics.

ENDO 6012. Clinical Endodontics 2. 5 Credit Hours.

An extensive clinical experience in the broad spectrum of endodontic practice is offered on the graduate level. Each student has the opportunity to maintain a comprehensive endodontic practice under the supervision of the director and staff of the postdoctoral program in endodontics.

ENDO 6013. Clinical Endodontics 3. 0.5 Credit Hours.

An extensive clinical experience in the broad spectrum of endodontic practice is offered on the graduate level. Each student has the opportunity to maintain a comprehensive endodontic practice under the supervision of the director and staff of the postdoctoral program in endodontics.

ENDO 6031. Hospital Endodontics Rotation. 1 Credit Hour.

Conducted at the Audie L. Murphy Memorial Veterans Affairs Hospital ("VA"), this rotation consists of the diagnosis, treatment planning and clinical treatment of endodontically involved teeth and supporting structures. This rotation provides the second-year postdoctoral endodontics student the opportunity to diagnose and treat endodontic problems on all types of inpatients and outpatients in the hospital setting.

ENDO 6032. Hospital Endodontics Rotation. 1 Credit Hour.

Conducted at the Audie L. Murphy Memorial Veterans Affairs Hospital ("VA"), this rotation consists of the diagnosis, treatment planning, and clinical treatment of endodontically involved teeth and supporting structures. This rotation provides the second-year postdoctoral endodontics student the opportunity to diagnose and treat endodontic problems on all types of inpatients and outpatients in the hospital setting.

ENDO 6060. Pulp Biology and Pain Pharmacology. 1.5 Credit Hour.

The purpose of this course is to provide solid foundational knowledge in the biology of dental pulp and periradicular tissues necessary for appropriate clinical decision making in endodontic and restorative diagnosis and treatment and to ensure that residents are prepared for future change in therapy or understanding new risk factors in disease.

ENDO 6071. Supervised Teaching. 1 Credit Hour.

The goal of this course is to teach students how to be an effective teacher. This course allows students to teach a sophomore lecture and laboratory course where dental students receive their initial exposure to endodontics. The student is given the opportunity to be actively involved in laboratory supervision of a small group of sophomore students as they perform specific endodontic procedures on extracted teeth. The student functions as an instructor side by side with endodontic faculty members who observe and critique the student's performance.

ENDO 6073. Literature Review 2. 5 Credit Hours.

This course is designed to familiarize the student with pertinent articles, both topical and current, related to endodontics. The articles, selected from the dental, medical and basic science literature, are assigned to the student to critically abstract and evaluate for research design, findings and conclusions.

ENDO 6075. Current Literature Review. 1.5 Credit Hour.

These courses are designed to familiarize the student with pertinent endodontic literature published during the academic year. Students will be assigned specific articles for review and literature will be critically evaluated in a seminar format.

ENDO 6077. Current Literature Review. 1 Credit Hour.

The goal of this course is for the student to develop a biological understanding and scientific basis for the diagnosis and treatment of various endodontic subjects by a review of current literature articles. Each resident will be assigned specific articles for review. Residents will be required to prepare written abstracts of these articles and orally present them to the class.

ENDO 6078. Literature Review. 4 Credit Hours.

This course is intended to introduce the endodontic resident application manuscripts related to our specialty. The articles are selected according to their impact on clinical and biological considerations pertinent to the understanding of the endodontic practice. Subjects will be broad in scope and will cover the majority of topics and treatment alternatives of classic, relevant and contemporary literature. These manuscripts will be discussed and evaluated, placing emphasis on their strength to already existing endodontic comprehension.

ENDO 6080. Focused Regendo Research. 4 Credit Hours.

This course is intended to provide a focused review on the most relevant scientific evidence on regenerative endodontics. Emphasis will be given to the critical appraisal of existing scientific evidence on stem cell biology and tissue engineering related to regenerative endodontics. The articles are selected according to their impact on clinical and biological considerations pertinent to the understanding of the endodontic practice.

ENDO 6083. Case Presentations 2. 1 Credit Hour.

This course is designed to provide faculty evaluation of endodontic cases treated by students. Critical evaluation will be made of the diagnosis, treatment plan, and treatment methodology. Differential diagnosis will be considered along with alternate treatment plans, and treatment methods. Reasons for any complications will be determined, and methods for preventing them will be discussed. The need for post-treatment follow-up examinations will be determined. The positive feedback provided by these courses is intended to increase student confidence and competence.

ENDO 6084. Case Presentations 2. 4 Credit Hours.

This course is designed to provide faculty evaluation of endodontic cases treated by students. Critical evaluation will be made of the diagnosis, treatment plan, and treatment methodology. Differential diagnosis will be considered along with alternate treatment plans, and treatment methods. Reasons for any complications will be determined, and methods for preventing them will be discussed. The need for post-treatment follow-up examinations will be determined. The positive feedback provided by these courses is intended to increase student confidence and competence.

ENDO 6085. Case Presentations 2. 4 Credit Hours.

This course is designed to provide faculty evaluation of endodontic cases treated by students. Critical evaluation will be made of the diagnosis, treatment plan, and treatment methodology. Differential diagnosis will be considered along with alternate treatment plans, and treatment methods. Reasons for any complications will be determined, and methods for preventing them will be discussed. The need for post-treatment follow-up examinations will be determined. The positive feedback provided by these courses is intended to increase student confidence and competence.

ENDO 6086. Case Presentations 3. 2 Credit Hours.

This course is designed to provide faculty evaluation of endodontic cases treated by students. Critical evaluation will be made of the diagnosis, treatment plan, and treatment methodology. Differential diagnosis will be considered along with alternate treatment plans, and treatment methods. Reasons for any complications will be determined, and methods for preventing them will be discussed. The need for post-treatment follow-up examinations will be determined. The positive feedback provided by these courses is intended to increase student confidence and competence.

ENDO 6087. Case Presentations 3. 1 Credit Hour.

This course is designed to provide faculty evaluation of endodontic cases treated by students. Critical evaluation will be made of the diagnosis, treatment plan, and treatment methodology. Differential diagnosis will be considered along with alternate treatment plans, and treatment methods. Reasons for any complications will be determined, and methods for preventing them will be discussed. The need for post-treatment follow-up examinations will be determined. The positive feedback provided by these courses is intended to increase student confidence and competence.

ENDO 6094. Research. 4 Credit Hours.

The course requires the student to formulate a protocol for the purpose of conducting an original investigation. Once the protocol is critically evaluated and accepted, students, under the guidance of a mentor, conduct a research project suitable for publication. The completed research paper is presented to the Endodontics Department research Committee, staff and guests for evaluation and critique.

ENDO 6095. Research. 4 Credit Hours.

The course requires the student to formulate a protocol for the purpose of conducting an original investigation. Once the protocol is critically evaluated and accepted, students, under the guidance of a mentor, conduct a research project suitable for publication. The completed research paper is presented to the Endodontics Department research Committee, staff and guests for evaluation and critique.

ENDO 6098. Thesis. 4 Credit Hours.

Completion of an acceptable thesis is required for the Master of Science degree. Registration in this course for at least one semester is required of all degree candidates. Admission to candidacy for the Master of Science degree is required in order to enroll in this course.

ENDO 7041. Junior Endodontics Lecture. 1 Credit Hour.

This course enhances the cognitive skills attained by the student that has successfully completed ENDO 6041 and ENDO 6142 in the Sophomore year. Topics covered include: endodontic radiography, endodontic diagnosis, endodontic irrigants and medicaments, evaluation of endodontic outcomes and retreatment, management of endodontic emergencies including pain control, diagnosis and management of tooth root resorption, endodontic treatment risk assessment, management of the immature root apex and management of traumatic tooth injuries including tooth fracture, luxation and avulsion. The importance of the inter-relationships with other dental disciplines such as periodontics and restorative dentistry are also emphasized.

ENDO 7043. Endodontics Clinic. 1 Credit Hour.

Students perform endodontic diagnosis and treatment procedures necessary to provide endodontic treatment as part of overall comprehensive clinical patient care.

Courses

INTD 1091. Independent Study. 4 Credit Hours.

Students will work directly with a faculty advisor or assistant dean to develop an independent plan of study.

INTD 3001. International Elective. 0 Credit Hours.

Students will work with the course director and Assistant Director of Global Health to identify an appropriate international elective site, using established sites/programs or one that the student discovers on their own. All rotations must be vetted and approved by the course director and will adhere to a community service-learning model that is a structured educational experience combining community service with preparation and reflection. Students are expected to help shape the learning experience around community-identified needs and advance insight related to the context in which service is provided, the connection between service and academic coursework, and students' roles as citizens and professionals. Students will spend 4 weeks living and working at an international service site. Sites may allow for a range of experiences, such as participating in patient care, conducting clinical or public health research, and/or participating in a language immersion program. There may also be opportunities for patient education and emphasis on efforts of local empowerment, aiming to build up the communities in a sustainable way. Regardless of the focus, all sites must be supervised by qualified health care providers. Students are encouraged to integrate themselves into the health care delivery system, to explore community needs that they could address, and when possible, to strive to make an impact through community education, home visits, and research. Reflection essays serve as a way to process experiences, including clinical cases, new perspectives gained, and analysis of health care disparities, and strategies for the overcoming poverty-related health problems. Students are encouraged to share their experiences upon return through a formal presentation.

INTD 3002. School of Medicine Research Elective. 0 Credit Hours.

Students will participate in basic or clinical research projects under the supervision of university faculty. The goal of this elective is to immerse students in a rich research environment and provide an opportunity to work with research mentors to fully engage in the research process from writing the proposal to collecting the data to disseminating research results. This elective is open to students who already have an established working relationship with a faculty member and who wish time to continue their work, students who wish to establish a new project, and for students who are in the MD-MPH degree program and MD with Distinction in Research Program. Interested students must contact the course director prior to the enrollment date to express interest in the elective and receive further instructions on the application process for the research and identification/ confirmation of the faculty mentor.

INTD 3030. Clinical Foundations. 3 Credit Hours.

The purposes of this completely online course are to: 1. Prepare early clinical students to increase knowledge in clinical settings including: a. Exposure to healthcare team members, b. Exposure to roles on clerkship (H&Ps, orders, SOAP notes, prescriptions, etc.), c. Interpretation of EKGs and radiographs, d. Interpretation of normal/abnormal lab values, e. Recognition of fatigue/strategies to combat fatigue in clinical settings, f. Basic understanding of ventilator management/ICU care, g. Patient insurance issues/patient health care financial resources, h. Avoidance of medical legal problems, i. Better success on exams, j. Performance of evidence-based searches in medical literature, k. Understanding fundamentals of translational research; 2. Assist students in developing new skills expected of early clinical students including: a. Intravenous catheter placement, nasogastric catheter placement, urinary catheter placement, and O2 management, b. Sterile gloving and sterile technique, c. Basic suturing/staple placement and removal; and 3. Prepare early clinical students for their roles in clinical settings including: a. Patient care under supervision, b. Patient privacy-HIPAA, c. Professionalism and responsibility to team and patients, d. Patient safety, e. Proper use of social media in patient care, f. Strategies to be best student on the first clerkship, g. OSHA and hand hygiene, h. Proper professional attire, i. Completion of evaluations on residents and faculty. The students will complete credentials for major clinical sites.

INTD 3031. Exploring Clinical Medicine- Module 1. 1 Credit Hour.

Exploring Clinical Medicine (ECM) is a longitudinal course across the clerkship year in which third-year medical students will learn about fundamental topics that are transcendent across specialties and are essential to the practice of clinical medicine. Learning activities are divided into three modules of thematically related content over the clerkship year. Modules will include a combination of required synchronous and asynchronous content. Each module will incorporate an OSCE. In ECM Module 1, the focus is on "Professional Communication." Topics include Communication in the Clinical Learning Environment and Difficult Patient Encounters. Completion of pre-clinical curriculum is required.

INTD 3032. Exploring Clinical Medicine- Module 2. 1 Credit Hour.

Exploring Clinical Medicine (ECM) is a longitudinal course across the clerkship year in which third-year medical students will learn about fundamental topics that are transcendent across specialties and are essential to the practice of clinical medicine. Learning activities are divided into three modules of thematically related content over the clerkship year. Modules will include a combination of required synchronous and asynchronous content. Each module will incorporate an OSCE. In ECM Module 2, the focus is on "Quality, Safety, Value." Topics include Patient-Centered & Cost-effective Care, Quality Improvement and Patient Safety, and Transitions of Care. Completion of pre-clinical curriculum is required.

INTD 3033. Exploring Clinical Medicine- Module 3. 1 Credit Hour.

Exploring Clinical Medicine (ECM) is a longitudinal course across the clerkship year in which third-year medical students will learn about fundamental topics that are transcendent across specialties and are essential to the practice of clinical medicine. Learning activities are divided into three modules of thematically related content over the clerkship year. Modules will include a combination of required synchronous and asynchronous content. Each module will incorporate an OSCE. In ECM Module 3, the focus is on "Social Concerns in Medicine." Topics include Human Trafficking, Climate Change, and Systemic Barriers to Health Care/Racial Disparities in Health Care. Completion of pre-clinical curriculum is required.

INTD 3058. Hospice and Palliative Medicine. 0 Credit Hours.

This rotation offers clinical experience in Hospice and Palliative Medicine (HPM). Palliative care provides treatment for seriously ill hospitalized and ambulatory patients and focuses on symptom management, enhancement of function, physical comfort, quality of life, psychosocial support, and communication about the goals of medical care for the patients as well as their families.

INTD 3091. Independent Study. 9 Credit Hours.

Students will work directly with a faculty advisor or assistant dean to develop an independent plan of study.

INTD 4007. Interprofessional Community Service Learning. 2 Credit Hours.

This is an innovative interdisciplinary service learning (CSL) course offered in partnership with the UT School of Pharmacy, PHR 270S, to allow medical students to integrate meaningful community service with instruction, preparation, and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities. This course will provide the opportunity for students to examine social justice and social determinant of health issues and apply these principles in a structured serviced learning practicum. The student-led service learning project will address the social and health needs of a community partner and will be conducted with the partner agency in a culturally competent manner. Through online learning modules, readings, and discussion; monthly class sessions; a group service learning project; and a structured service learning practicum, this course combines community service with preparation and reflection to foster civic responsibility in the health professions. Open for Cross Enrollment on Space Available Basis.

INTD 4008. Interprofessional Care in HIV. 0.5 Credit Hours.

Students will have the opportunity to learn how to function as a member of an interprofessional team in HIV case management. The objective is for students to become familiar with issues of patient safety, health literacy, medication reconciliation, and interprofessional teamwork in HIV care. This is an elective didactic course.

INTD 4009. Interprofessional Care in HIV. 2 Credit Hours.

Students will have the opportunity to learn how to function as a member of an interprofessional team in HIV case management, and become familiar with issues of: patient safety, health literacy, medication reconciliation, treatment guidelines, and interprofessional teamwork in HIV care.

INTD 4011. Capstone I: Machine Learning and Artificial Intelligence for Health and Medicine. 4 Credit Hours.

This course is intended as a stand-alone demonstration of AI principles for completion of the MS in AI dual degree program. Project topics include applied machine learning, neural networks, or natural language processing in health and medicine. The course aims to give students the minimal requisite skills to carry out an independent research project in ML and AI, train students to write up their findings and ideas accurately, and clearly and coherently present their own findings. Each student must have a mentor with a primary appointment in UTHSCSA, and an additional mentor with a primary appointment in UTSA (and adjunct appointment in Medical Education at UTHSCSA). Project topics and data may be given by assigned mentors which include but not limited to Patient Risk Identification, Imaging Classification (either digital pathology, or radiology), Clinical Trials Research, Basic research in the health sciences with parametric and non-parametric data. Prerequisites include: completion of the one-year didactic coursework through UTSA is required for the MS in AI program, students must have at least an introductory level of data science understanding with preparation for a standard data science workflow, knowledge of basic R/Python/MATLAB programming, and select mentors from UTHSCSA and UTSA.

INTD 4012. Capstone II: Machine Learning and Artificial Intelligence for Health and Medicine. 4 Credit Hours.

The primary learning objective of this elective is to prepare students for the advanced use of machine learning (ML) and artificial intelligence (AI) techniques in the professional health field. Successful completion of this course will provide students with knowledge of applications of ML and AI to health and medicine with quarter long project approved by the instructor and mentor. This course is a requirement for students enrolling in the MD/MS in AI dual degree program but is available to all medical students in good standing at the LSOM. If time allows, topics on more advanced theories of machine learning and artificial intelligence will be introduced. This course is a continuation of Capstone I. The course is intended to take the experience students gained in Capstone I and apply to an original/novel research idea in the data science domain. The course aims to give students the skills to conduct original research with a mentor, write up their findings in preparation for publication to a journal, and ultimately submit them for publication. Completion of Capstone II qualifies the student for an MS in AI with a thesis. Original/Novel research ideas may be given to students by their mentors, or they may choose a topic of their which will then be approved by both the mentors. The students must first complete Capstone I, and must have the same mentors as Capstone I and II unless a request is made and approved. Prerequisites for this course include completion of the one-year didactic coursework through UTSA is required for the MS in AI program. Students must also have at least an introductory level of data science understanding with preparation for a standard data science workflow, knowledge of basic R/Python/MATLAB programming, and select mentors from UTHSCSA and UTSA. Completion of INTD 4011: Capstone I; Machine Learning and Artificial Intelligence for Health and Medicine.

INTD 4015. Humanism in Medicine Fellowship. 2 Credit Hours.

This is a longitudinal 4th-year elective to support and nourish the inherent altruism of our students. This elective will bring together like-minded students and faculty who have a passion for caring for the medically underserved in their communities. The students will take a leadership role in managing and directing the student-run clinics at the Alpha Home, SAMM Transitional Living and Learning Center, Haven for Hope, Travis Park Dermatology (under faculty supervision). Clinical experiences will be at these clinics. This elective will include a few evening seminars throughout the year in which students and faculty meet to discuss social justice, how to start a free clinic, homelessness and topics chosen by the students. Every student will complete a project of their choice over the year.

INTD 4018. Independent Elective in Ethics. 2 Credit Hours.

In this longitudinal course, students will be required to undertake an independent study into a specific issue in medical ethics or medical humanities. Students will be required to read on research methods in medical ethics as well as literature in their issue of interest, and then to propose and conduct an original study project, a literature review, a position paper, or an ethical analysis of a particular topic or case. Students will be expected to write an academically rigorous final research report of 10 to 15 pages. Students will be encouraged to produce a final paper that can be submitted for publication in a peer-reviewed bioethics or medical humanities journal. Students will be required to meet with the instructor and/or chosen faculty advisor over the course for assistance, guidance, and discussion. (Center for Medical Humanities and Ethics).

INTD 4019. Clinical Ethics. 2 Credit Hours.

Students in this two-week course will have the opportunity to focus on work in clinical ethics consultation. The student will be required to participate in rounds as an ethicist, do in-depth reading on clinical ethics consultation, observe clinical ethics consults, attend ethics committee meetings, and provide an educational seminar to hospital staff on an issue of ethical significance.

INTD 4025. Healthcare Practice and Policy Elective. 0.5 Credit Hours.

The Healthcare Practice Elective is an introductory-level, discussion-based, eight-hour course targeted to fourth-year medical students. The course focuses generally on practice and policy issues of payment methodologies, cost-effectiveness, and access to care.

INTD 4030. Serving Marginalized Communities: From local to global. 2 Credit Hours.

This is a 2-week, in person course for 4th-year medical students who are planning future work in marginalized communities either locally or globally. This preparatory course uses a multidisciplinary, asset-based approach to provide a foundation of practical knowledge in community engagement to optimize the students' experiences, facilitate their adaptation to working in diverse settings, and maximize their impact in the communities where they serve. Topics include community partnerships and responsiveness to community needs, chronic and infectious illnesses of high burden in marginalized communities, prioritizing community resources, advocacy, health equity, ethical dilemmas, cultural humility, and professionalism. Course material is presented through a variety of approaches, including lectures, small-group case discussions, laboratory sessions, and online learning modules.

INTD 4035. COVID-19 The Pathogenesis of a Pandemic. 2 Credit Hours.

Students will be introduced to the novel coronavirus SARS-CoV-2 and the disease it causes, COVID-19. They will review emerging information pertaining to the virus and disease including virology, epidemiology and pathophysiology. They will also be engaged with material covering leadership principles, communication and social determinants of health. They will participate in online activities and discussions to further facilitate learning. This elective is completely online. Prerequisites: Completed MS1 and MS2 curriculum.

INTD 4045. Patient Notes- Enrichment Elective. 0 Credit Hours.

It is an interactive, inter-professional course that engages students in music listening sessions to teach students active listening skills. Through various forms of music, students will learn how to actively listen for specific details to gain insight on meaning, become comfortable with ambiguity and interpretation, and develop pattern recognition skills to quickly recognize deviation. Students will also develop stronger methodology for writing patients notes through conceptual practice of SOAP format notes for music pieces. Taught jointly by UTHSCSA faculty and professional musicians, this strategy of applying practical skills to an abstract concept such as music will refine these skills for students in clinical settings. Specifically, this course aims to improve interpersonal communication skills, and organizational note writing. This is also an opportunity for students to practice problems solving with other healthcare professionals.

INTD 4048. Art Rounds. 2 Credit Hours.

This is an interactive, interprofessional course that takes students to the McNay Art Museum to learn physical observation skills. Studies demonstrate that increased observational skills translate to improved physical examination skills. Using artwork as patients, students will have the opportunity to learn how to observe details and how to interpret images based on available evidence. Taught jointly by Health Science Center faculty and McNay museum educators, students will have the opportunity to develop and hone their observation, problem solving, and assessment skills. They will also observe, interpret, and give case reports on the original works of art to teach them the skill of verbalizing descriptions of what is seen, and not to accept assumptions made with a first impression. Open for Cross Enrollment on Space Available Basis.

INTD 4058. Hospice and Palliative Medicine Elective. 4 Credit Hours.

This rotation offers clinical experience in Hospice and Palliative Medicine (HPM). Palliative care provides treatment for seriously ill hospitalized and ambulatory patients and focuses on symptom management, enhancement of function, physical comfort, quality of life, psychosocial support, and communication about the goals of medical care for the patients as well as their families.

INTD 4103. Communication Skills. 0.5 Credit Hours.

To introduce fourth year medical students to the principles of conducting public interviews, presentations and effectively disseminating information to the communities they will serve.

INTD 4104. Improving Patient Outcomes. 0.5 Credit Hours.

This course is designed to increase a student's knowledge of and skills in identifying systemic problems with health care delivery and patient safety, collecting and analyzing data, generating solutions, presenting results and evaluating peers. The course objectives include facilitating systems thinking, exposing students to the ACGME general competencies (with emphasis on practice-based learning and improvement and systems-based practice), increasing understanding of health care economics and working in teams.

INTD 4105. Medical Jurisprudence. 0.5 Credit Hours.

The course will center on the Texas Medical Practice Act and applicable federal laws.

INTD 4106. Practical Ethics For Healers. 0.5 Credit Hours.

The course is the capstone of the four-year longitudinal curriculum in humanities and ethics. The goals are to reflect upon 1) physician's values, attitudes, and their intersection with cultural values and attitudes; 2) the historical and moral traditions of medicine in the context of society, politics, spirituality, and the health care system; and 3) the personal identity of a doctor. Open for Cross Enrollment on Space Available Basis.

INTD 4107. The Skin Around Us: A View of Skin Disease from a Humanities Perspective. 4 Credit Hours.

This elective is for fourth year medical students with a special interest in learning about skin diseases through a humanities perspective. Throughout the four week course, students will attend daily clinics, create a project and write an essay on activities encountered during the elective. The students will also complete brief writing assignments each week after watching videos, movies, and/or reading books.

INTD 4108. Bridging the Gap: Transition from UME to GME. 4 Credit Hours.

Medical education is changing with the introduction of a United States Licensure Medical Examination (USMLE) Step 1 scored on a pass/fail basis, increasing focus on the Undergraduate Medical Education to Graduate Medical Education transition, and changes to the residency application process. No longer can medical students wait until their senior academic year to prepare for USMLE Step 2 and discern their chosen specialty. In this course, which is to be delivered during the spring immediately prior to their senior year, medical students will be given instruction on specialty discernment and trained in test preparation techniques. Specialty discernment requires various forms of advising and mentoring. In this course, students will receive general instruction on the process of specialty discernment and will use online resources to prepare for residency applications in the context of academic metrics, specific program requirements, and specialty-based resources. The transition from undergraduate to graduate medical education is one of intense focus. While the transition seems as if it has a marked delineation, it exists on a continuum. In order to support the active process of creating goals, students need to reflect on their experiences as a clerkship student and create expectations of themselves in the context of their chosen specialty and career. Goal orientation in the context of mastery orientation defines success in terms of how well the knowledge, skills, and abilities have been demonstrated. (Cutrer, et al.) This type of goal orientation requires reframing and additional advising depending on the phase of the learner. Test preparation does not have to be separate and dedicated from the medical curriculum. In fact, directing learners to recognize opportunities to use exam preparation to build and apply more clinically-minded strategies, even when the content of the exam may not focus on clinical reasoning or diagnosis, might better prepare them to learn from their patients and to apply similar strategies later on. (Swan Sein, et al., 2021). By creating learning structures that facilitate this environment, medical students can use test preparation and test taking skills beyond the testing center. Prerequisites: at least 1 clerkship.

INTD 4109. Non-Fiction Writing for Advocacy: A workshop and practicum. 2 Credit Hours.

The non-fiction writing practicum is a longitudinal writing workshop designed to equip motivated students with the basic skills necessary to serve as effective advocates-in-writing for patients, the profession of medicine, and population health. Open for Cross Enrollment on Space Available Basis.

INTD 4110. Getting Ready to Teach During Your Residency Program. 0.5 Credit Hours.

The goal of this 8-hour course is to help senior medical students, who will be residents in a few months, develop teaching skills that will enhance the quality of their interactions with students. The course will be conducted in an interactive workshop format to allow participants to practice important teaching skills for residents. These include 1) orienting and priming students to their responsibilities and roles and accepting the personal role of teacher and role model, 2) giving feedback to improve student performance, 3) helping students to improve their patient presentations-the use of questioning, and 4) coaching procedural and technical skills. The participants will practice these skills and receive feedback from their course peers and instructors based on the guidelines for clinical teachers in action with students and provide critiques. Large and small group discussions and role plays will be used to reinforce teaching principles.

INTD 4111. Fast Healthcare Interoperability Resources (FHIR) for Medical Students. 4 Credit Hours.

FHIR for Medical Students delves into Fast Healthcare Interoperability resources (FHIR). This course is tailored for medical student with experience in C#, Java, and/or JavaScript, this will also be a prerequisite for the course, and those aiming to develop their skills with SMART on FHIR and CDS Hooks. The curriculum is hands-on with exercises, enabling participants to learn by both developing and reviewing practical software applications. Prerequisites: Some fluency in Java, C# or JavaScript/Node.js.

INTD 4205. Veritas Mentors in Medicine Longitudinal Elective. 2 Credit Hours.

This is longitudinal elective and the course work requirements will be for 2 week credit and must be complete by March 1st. Evaluation of MiM performance will include feedback from faculty mentors and students.

INTD 4210. School of Medicine Research Elective Level 1. 4 Credit Hours.

Medical research is multidisciplinary and broad in scope. Students will participate in basic, clinical research, quality improvement, or patient safety research projects under the supervision of faculty in the Health Science Center. The goal of this elective is to immerse students in a rich scholarly environment and provide an opportunity to work with research/faculty mentors to fully engage in a scholarly research process from writing the proposal to collecting the data to disseminating results. This elective is open to students who already have an established working relationship with a faculty member and who wish time to continue their work, students who wish to establish a new project, and for students who are in the MD-MPH degree program and MD with Distinction in Research Program. Interested students must submit a research elective application which includes the faculty mentor the student will work, to the office of UME, no later than 12 weeks before the research elective is to begin. Applications will be reviewed and confirmed or declined no later than 8 weeks prior to the proposed start date of the elective. Students will be able to 1) Formulate a research question and identify a research methodology to answer that question; 2) understand research ethics and apply an ethical approach to research design, implementation, and dissemination 3) design a research study and gather quality data; 4) apply and interpret basic biostatistics relevant to the individual research project; 5) write scientific reports. The supervising faculty member will evaluate the performance of the student using a standard, research specific, medical student evaluation form. Students will receive a Pass or Fail summative grade at the conclusion of the 4 week elective. Faculty will be expected to give the student formative feedback after two weeks to assist the student in meeting all expectations to pass the elective.

INTD 4211. School of Medicine Research Elective Level 2. 4 Credit Hours.

Medical research is multidisciplinary and broad in scope. Students will participate in basic, clinical research, quality improvement, or patient safety research projects under the supervision of faculty in the Health Science Center. The goal of this elective is to immerse students in a rich scholarly environment and provide an opportunity to work with research/faculty mentors to fully engage in a scholarly research process from writing the proposal to collecting the data to disseminating results. This elective is open to students who already have an established working relationship with a faculty member and reflects their increasing experience with the research process. INTD 4210 Level 1 elective or evidence of past experience knowledge and/or skills is a prerequisite. The expectation is that enrolled students will continue with research experiences begun in INTD 4210 Level 1 including students pursuing the MD-MPH degree and MD with Distinction in Research. Interested students must submit a research elective application which includes the faculty mentor the student will work, to the office of UME, no later than 12 weeks before the research elective is to begin. Applications will be reviewed and confirmed or declined no later than 8 weeks prior to the proposed start date of the elective.

INTD 4212. School of Medicine Research Elective Level 3. 4 Credit Hours.

Medical research is multidisciplinary and broad in scope. Students will participate in basic, clinical research, quality improvement, or patient safety research projects under the supervision of faculty in the Health Science Center. The goal of this elective is to immerse students in a rich scholarly environment and provide an opportunity to work with research/faculty mentors to fully engage in a scholarly research process from writing the proposal to collecting the data to disseminating results. Students enrolled in this course will have prior experience with research and ongoing research activities. As such, this elective is open to students who already have an established working relationship with a faculty member and reflects their increasing experience with the research process. INTD 4211 Level 2 elective is a prerequisite. As with INTD 4211 Level 2, the expectation is that enrolled students will continue with research experiences begun in INTD 4210 Level 1 and INTD 4211 Level 2 including students pursuing the MD-MPH degree and MD with Distinction in Research or produce evidence of past experience knowledge and/or skills which are deemed equivalent to these prerequisites. Interested students must submit a research elective application which includes the faculty mentor the student will work, to the office of UME, no later than 12 weeks before the research elective is to begin. Applications will be reviewed and confirmed or declined no later than 8 weeks prior to the proposed start date of the elective. Students will be able to formulate a research question and identify a research methodology to answer that question; understand research ethics and apply an ethical approach to research design, implementation, and dissemination; design a research study and gather quality data; apply and interpret basic biostatistics relevant to the individual research project; write scientific reports. The supervising faculty member will evaluate the performance of the student using a standard, research specific, medical student evaluation form. Students will receive a Pass or Fail summative grade at the conclusion of the 4 week elective. Faculty will be expected to give the student formative feedback after two weeks to assist the student in meeting all expectations to pass the elective.

INTD 4300. Advanced Generative AI. 4 Credit Hours.

This 4-week elective provides a comprehensive introduction to Generative AI technologies with a specific focus on applications in medicine. Through structured morning lectures, interactive demonstrations, hands-on exercises, and assignments, students will explore fundamental concepts and practical applications of Large Language Models (LLMs). Topics include data structures, vectorization, tokens, encoding/decoding, sentence transformers, fine-tuning techniques (PEFT/LORA), retrieval augmented generation, multimodal applications (visual/audio), and critical considerations regarding bias and legal implications in medicine. This course is exclusively for MS in AI students in good standing who have completed Capstone I. Students will complete daily homework assignments and a final project. The course is pass/fail, with grading based on attendance, participation, assignment completion, and the final project. Must be a MD/MSAI dual degree student. Prerequisites: INTD 4011.

INTD 5005. Core Course 1: Biochemistry. 2 Credit Hours.

Topics to be covered include: protein structure; properties of enzymes; structure, biosynthesis, and function of lipids; pathways and regulation of carbohydrate metabolism and biosynthesis and regulation of amino acids, nucleotides, and related compounds. Prerequisites: consent of instructor.

INTD 5007. Advanced Cellular And Molecular Biology. 4 Credit Hours.

This course provides an in-depth learning experience that instructs students on the fundamentals of molecular biology and cell biology as well as prepares the student to evaluate and design new research in the cutting-edge areas of modern molecular biology and cell biology. The course combines a didactic program of lectures along with a small group discussion format in which students interact closely with a group of faculty who have active research programs. The course focuses on active areas of research in molecular biology: Chromatin structure, DNA Transcription, DNA Replication and Repair, Recombination, RNA processing and regulation, Protein processing, targeting and degradation and in cell biology: Cell Signaling and Communication, Cell Growth, and Cell Death. Each week, the faculty provide students with didactic lectures on a current research area. Students and faculty will then jointly discuss key publications that serve to bridge the gap between the fundamental underpinnings of the field and the state of the art in that area.

INTD 5013. Perio/Pros/Endo/Orth Interdisciplinary Course 1. 1 Credit Hour.

A seminar that brings together the residents and graduate staff from the periodontic, prosthodontic, endodontic and orthodontic postdoctoral programs to share clinically relevant multidisciplinary information. Patient diagnostic evaluations and treatment plans are evaluated in an interactive environment. Selected topics involving new advancements are presented and discussed.

INTD 5021. Dental Biomed Core 2. 1 Credit Hour.

This course is a continuation of MSDS 5020 Dental Biomedical Core Course 1.

INTD 5023. Research Ethics. 1 Credit Hour.

The goal of this course is to provide the Master's student an opportunity to gain the essential standards necessary for training and education approved by the National Institute of Health. This course links to the web-based NIH Clinical Research Training On-Line Course for Principal Investigators that is required for all individuals conducting research. This course is open to current Health Science Center students. Open for Cross Enrollment on Space Available Basis.

INTD 5031. Common Interprofessional Education Experience - LINC. 0 Credit Hours.

This course is intended to introduce students to IPE at UT Health San Antonio using the shared IPE framework as defined in the QEP facilitate interprofessional socialization, and prepare students for IPE activities they will experience as part of program-specific IPE plans.

INTD 5032. TeamSTEPPS - Interprofessional Education Course. 0 Credit Hours.

TeamSTEPPS is an evidence-based set of teamwork tools, aimed at optimizing patient outcomes by improving communication and teamwork skills among health care professionals.

INTD 5035. UTeach. 2 Credit Hours.

The course is designed for post-doctoral fellows, senior graduate students, faculty members, research staff and residents who are interested in a career in teaching and desire to acquire knowledge about learning processes and to develop educational planning, teaching and assessment skills to enhance their "teaching toolkit." UTeach (formerly University Teaching Excellence Course; UTEC) participants practice key skills needed for success in college-level teaching, working individually and in teams to accomplish course objectives. Classes will be supplemented by readings, worksheets and self-assessment inventories. Although the course will provide instruction in contemporary pedagogic techniques, it primarily emphasizes teaching science courses for undergraduates on campuses at predominantly undergraduate institutions (PUIs), rather than teaching graduate students and medical / dental students at the health science center (HSC) or other academic HSCs. Course instructors include faculty from the Schools of Medicine, Dentistry and Nursing at UTHSCSA as well as visiting faculty from local PUIs, St. Mary's University and Our Lady of the Lake University. UTeach has been offered for three consecutive fall semesters now (2015, 2016, 2017). It is sponsored by the San Antonio Biomedical Education and Research (SABER) Program that is supported by an Institutional Research and Academic Career Development Award (IRACDA) from the National Institute of General Medical Sciences of the NIH (PHS grant, K12 GM11726).

INTD 5036. Simulation Interprofessional Education Experience -- LINC. 0 Credit Hours.

The LINC Simulation IPE Experience builds on the fall common IPE experience and occurs in the spring semester. Conceived and supported by the LINC Academic Affairs Council and housed within the LINC Faculty Councils Didactic IPE Initiative, the purpose of this university-wide IPE activity is threefold: (1) introduce students to simulation at UT Health San Antonio; (2) facilitate interprofessional socialization; and, (3) prepare students for IPE activities they will experience as part of program-specific IPE plans. Students complete the LINC Simulation IPE Experience in interprofessional groups of 3-4. Interactivity is emphasized as student groups work through 5 hours of instruction, including interprofessional socialization activities, mini-lectures, illustrated case studies, video case studies, and interprofessional discussions rooted in problem-based learning. Prerequisites: INTD 5031.

INTD 5037. Clinical Interprofessional Education Experience -- LINC. 0 Credit Hours.

The LINC Clinical IPE Experience builds on the fall and spring first year common IPE experience and occurs in the spring semester of the second/third year. Conceived and supported by the LINC Academic Affairs Council and housed within the LINC Faculty Councils Didactic IPE Initiative, the purpose of this university-wide IPE activity is threefold: (1) introduce students to simulation at UT Health San Antonio; (2) facilitate interprofessional socialization; and, (3) prepare students for IPE activities they will experience as part of program-specific IPE plans. Students complete the LINC Clinical IPE Experience in interprofessional groups of 3-4. Interactivity is emphasized as student groups work through 5 hours of instruction, including interprofessional socialization activities, mini-lectures, illustrated case studies, video case studies, and interprofessional discussions rooted in problem-based learning.

INTD 5040. Fundamentals Of Neuroscience1: Molecular, Cellular, & Developmental Neuroscience. 2 Credit Hours.

This course is intended to introduce students to a broad survey of the basics of molecular, cellular and developmental neuroscience. The course is organized into a series of three modules: biochemical and cellular properties of nervous system cells, development of neuronal systems, and neurotransmission and neuromodulation, which covers the fundamentals of these three areas. Current topics and concepts are discussed in discussion sessions that include student participation. Two components; Neuroscience students register for both PHYL 5041 and INTD 5040.

INTD 5043. Fundamentals Of Neuroscience 2: Systems Neuroscience. 3 Credit Hours.

This course, the second component of our broad survey of the basics of neuroscience, begins at the level of the neural circuit, and guides the students through an understanding of increasingly complex levels of organization and function in the brain. Topics include neurotransmitter systems, sensory and motor function, motivated behavior, regulation and integration of autonomic, behavioral, and emotional responses in the limbic system, higher order cognitive processes, and the neurobiological basis underlying some important psychiatric disorders and their treatment.

INTD 5046. Metanalysis In Cognitive Neuroimaging. 2.5 Credit Hours.

The objective of this course is to familiarize students with human functional brain imaging methods, experimental designs, statistical analyses, inferential strategies, and content. Students are guided through a literature-based research project that culminates in a quantitative metanalysis of a set of studies using similar tasks.

INTD 5047. Neuroanatomy. 2 Credit Hours.

The purpose of this course is to provide students with a practical working knowledge of the structure of both the peripheral and central nervous system. The emphasis will be on the organization of the human brain, although the brains of other species may also be included if appropriate for a specific brain region. The course will look at each of the individual components of the central nervous system in some depth but will also emphasize the complex integration of these various components into a functional brain. The topics covered in the course are specifically designed to mesh in time with those covered in Fundamentals of Neuroscience 2 describing the function of these areas. For this reason, it would be best if these two courses were taken concomitantly. The course will be didactic with digital images, models, and wet specimens included in the course.

INTD 5051. Research Methodology and Evidence-Based Practice. 2 Credit Hours.

This course is designed to introduce dental residents and faculty to critical thinking, research methodology, and evidence-based practice skills.

INTD 5064. Applied Statistics for Health Care Practitioners. 3 Credit Hours.

This online course focuses on the application of descriptive and inferential statistics in research studies. Students are expected to gain knowledge and skills that will enable them to understand, interpret, and evaluate statistical results; work with a consultant statistician; and use software to enter, analyze, and summarize data. Course requirements include homework assignments, online discussions and/or chats, and periodic projects.

INTD 5066. Laughter is the Best Medicine: An Interdisciplinary Elective about Humor, Healing, and Healthcare. 1 Credit Hour.

This class is a serious look at humor! The physiological and psychological benefits of humor, as well as its therapeutic use with patient interactions, will be explored. Students will learn how to develop and improve their personal use of humor to combat burn out, through techniques to enhance coping skills and stress reduction. Student participation and interaction is integral to the content delivery.

INTD 5067. Introduction to Programming for Biologists. 3 Credit Hours.

This course covers fundamentals of computer programming. It is designed and tailored for biologists in three ways: 1) students can pass it with minimal mathematical background, 2) when possible, examples and exercises are based on biological data analyses, and 3) it prepares students for other courses that are focused on bioinformatics techniques and tools. The topics are similar to the first introductory course that a student would take in a computer science program including: An introduction to Unix operating systems (i.e., Linux and macOS), basic command line and terminal usage; The Emacs text editor; Using simple data structures including vectors, matrices, lists, and classes; Conditional statements; Loops; Functions; Debugging; Organizing computational biology experiments and Code repositories and version control systems including Git. While this course is based on R, students are expected to be able to self-teach other high-level programming languages including Python, Matlab, etc. after learning fundamentals of programming in this course. Students will learn skills that are essential for visualization, statistical analysis, machine learning, analyzing next generation sequencing data, and other bioinformatics analyses. Open for Cross Enrollment on Space Available Basis.

INTD 5074. Topics In Translational Medical Product Development. 1 Credit Hour.

It is crucial to understand the intricate process of translating basic research into market driven products, navigate the complex pathways of intellectual property management and the regulatory affairs of agencies such as the FDA. This course will offer students in biomedical sciences the opportunity to integrate industry-relevant training and experience with their basic science education. The course will explore the marketing and regulatory process by which a biomedical product is developed and brought to commercialization.

INTD 5075. Complementary Healthcare for the Clinician. 0 Credit Hours.

The goal of this elective is to introduce future doctors to practices outside of the classical medical school curriculum that promote an evidence-based approach to wellness. This is so that the medical students of the UTHSC School of Medicine are informed about the reality, evidence and rumor surrounding a variety of commonly used alternative and supplementary healthcare practices. The of this class is not to make the student an expert in areas such as acupuncture or yoga, but to be well informed of the role of such practices as it relates to patient treatment and wellness. To this end, all the classes will have a practical component which will allow the students to experience the alternative modalities in a structured setting.

INTD 5081. Topics In Cardiovascular Research. 1 Credit Hour.

This course is designed to familiarize students with the current literature related to cardiovascular disease. Each week a different research topic selected from the recent literature is presented and discussed. Students are expected to attend and participate in the discussions. In addition, students are required to prepare and present once during the semester. A list of previous and current course presentations will be available online.

INTD 5082. Responsible Conduct of Research. 1.5 Credit Hour.

This foundational course introduces students to core ethical content necessary for responsible research conduct. Through interactive seminars, students will learn about (1) scientists as responsible members of society (contemporary ethical issues in biomedical research and environmental/social impacts of research), (2) policies for research with human subjects and vertebrate animals, (3) collaborative research, (4) conflicts of interest (personal, professional, financial), (5) data acquisition and laboratory tools (management, sharing, ownership), (6) responsible authorship and publication, (7) mentor/trainee responsibilities and relationships, (8) peer review, and (9) research misconduct (forms of misconduct and management policies).

INTD 5091. Special Topics. 1-4 Credit Hours.

This is a placeholder course, for which graduate students may register, if they are unable to select a specific track core course at the time of registration. Tracks are: Biology of Aging, Cancer Biology; Cell and Molecular Biology; Genetics, Genomics, & Development; Membrane Biology & Cell Signaling; Metabolism & Metabolic Disorders; Microbiology & Immunology; Molecular Biophysics & Biochemistry; Molecular, Cellular, & Integrative Physiology; Neuroscience; and Pharmacology. The course may be repeated for credit.

INTD 5094. Independent Study. 1-4 Credit Hours.

This elective allows for detailed in-depth study in a specific area of study. The area and mode of study are to be agreed upon by the student and instructor. The course may be repeated for credit when the area of study varies. Clock hours are to be arranged. Prerequisites: Graduate standing and consent of instructor.

INTD 5101. Health, Equity and the Environment. 1 Credit Hour.

This course will introduce IPE to UT Health San Antonio (UTHSA) students through an elective course called, Health, Equity and the Environment that will focus on knowledge of environmental health disparities and skills that empower students to actively work to reduce disparities and promote wellbeing in their patients and communities. The purpose of this course is to determine the impact of the IPE course on developing IPE teams/teamwork and communication competencies relative to environmental health knowledge and its intersection with health equity. UTHSA students will complete IPE competencies pre-post surveys, a course evaluation and conduct a community service learning (CSL) activity to evaluate their understanding of IPE and environmental health and inequities. Open for Cross Enrollment on Space Available Basis.

INTD 6002. Ethics In Research. 0.5 Credit Hours.

This course covers topics relevant to ethics in scientific research. The course is taught on a case-study basis, dealing with real and hypothetical situations relevant to the conduct of scientific research. Topics discussed will include, but will not be limited to: data management, peer review, recognizing scientific misconduct, authorship, and The University of Texas regulations relevant to human and animal research. This course is required of all doctoral graduate students.

INTD 6007. Advanced Cell Biology. 2 Credit Hours.

This course provides an in-depth learning experience that instructs students on the fundamentals of cell biology as well as prepares the student to evaluate and design new research in the cutting-edge areas of modern cell biology. The course combines a didactic program of lectures along with a small-group discussion format in which students interact closely with a group of faculty who have active research programs. The course focuses on active areas of research in cell biology: Cell Signaling and Communication, Cell Growth, and Cell Death. Each week, the faculty jointly discuss key publications that serve to bridge the gap between the fundamental underpinnings of the field and the state of the art in that area. Students and faculty will then jointly discuss key publications that serve to bridge the gap between the fundamental underpinnings of the field and the state of the art in that area.

INTD 6008. Mitochondria & Apoptosis. 1 Credit Hour.

This course will focus in depth on Mitochondria and Apoptosis. Topics will include: Mitochondria and Respiration; Mitochondria and Reactive Oxygen Species; Mitochondria and Apoptosis. It will provide an opportunity for a unique learning experience where the student can prepare to evaluate and design new research in the cutting-edge areas of modern cell biology and molecular biology. Instead of a didactic program of lectures, the entire course comprises a small-group format in which students interact closely with a group of faculty who have active research programs. Each week, faculty will provide students with a brief overview of the research area. Students and faculty will then jointly discuss key publications that serve to bridge the gap between the student's prior understanding of the field and the state of the art in that area.

INTD 6009. Advanced Molecular Biology. 2 Credit Hours.

This course will provide an in-depth learning experience on the fundamentals of molecular biology as well as prepare the student to evaluate and design new research in the cutting-edge areas of modern molecular biology. The course combines a didactic program of lectures along with a small-group discussion format in which students interact closely with a group of faculty who have active research programs. The course focuses on active areas of research in molecular biology: Chromatin structure, Transcription, DNA Replication and Repair, Recombination, RNA processing and regulation, Protein processing, targeting and degradation. Each week, the faculty provide students with didactic lectures on a current research area. Students and faculty then jointly discuss Key publications that serve to bridge the gap between the fundamental underpinnings of the field and the state of the art in that area.

INTD 6011. Introduction To Science Of Teaching. 1 Credit Hour.

This course will provide insight into the basic skills of learning and teaching. Faculty from the Academic Center for Excellence in Teaching and the Graduate School will provide the opportunity to learn the skills, strategies, and experiences for a future in academia and teaching. Topics include lecture presentations on why scientists choose to teach, planning a student learning experience in addition to developing a lecture syllabus, curriculum and teaching portfolio and philosophy. The course is recommended for Supervised Teaching Course INTD 6071.

INTD 6014. Perio/Pros/Endo/Orth Interdisciplinary Course 2. 1 Credit Hour.

This seminar brings together the residents and graduate staff from the periodontic, prosthodontic, endodontic and orthodontic postdoctoral programs to share clinically relevant multidisciplinary information. Patient diagnostic evaluations and treatment plans are evaluated in an interactive environment. Selected topics involving new advancements are presented and discussed.

INTD 6019. Pharmacotherapeutics. 1 Credit Hour.

This course is designed to review general principles of pharmacology; current and accepted pharmacotherapy for the medical management of pain, infection, and selected systemic diseases; and associated adverse drug events. It is based on the top 200 drugs dispensed by U.S. community pharmacies for the prevention, diagnosis, and/or treatment of disease with special reference to dentistry.

INTD 6035. Introduction to R and Unix/Linux. 0.5 Credit Hours.

Computational biology is a rapidly emerging subfield of biomedical science. Acquiring basic computational skills will enable biologists to better understand and analyze "big data" and use novel approaches to answer biological questions. In addition, it will improve communication with computational scientists and bioinformaticians, thereby enhancing collaborations. The course consists of two modules. The first 5-week module is designed to gain familiarity with R coding. The second 3-week module covers working in the Unix/Linux environment and the use of shell scripts. This course will be taught in the form of interactive hands-on computer classes in combination with homework assignments. No prior knowledge of programming or coding is required. This course is designed to prepare students for more advanced computational biology course work, such as INTD 6062 and CSAT 6095. Open for Cross Enrollment on Space Available Basis.

INTD 6037. Analytical Methods in Biomedical Research. 1 Credit Hour.

This three-week interactive course introduces students to fundamental methodologies used to analyze cells and biomolecules including nucleic acids and proteins. Principles, procedures, advantages and limitations of routinely used methods will be discussed. By the end of this course, the student should be able to: Define the principles and procedures underlying cell culture, isolation of cell organelles, cell proliferation, tissue embedding, sectioning and staining, define the principles and procedures underlying methods to quantify and manipulate nucleic acids, define the principles and procedures underlying methods to quantify proteins and determine protein-protein interactions, list the common methodologies used to generate mouse models for biomedical research.

INTD 6038. Biomedical Fundamentals. 3 Credit Hours.

This course will cover diverse topics in molecular and cell biology, physiology, immunology and neuroscience including innate and adaptive immunity, cell signaling, protein trafficking, cell adaptation and cell death, stem cells, and membrane physiology. Interactive lectures based on a flipped classroom approach will be followed by small group presentations and discussions focusing on critically evaluating scientific publications relevant to the lecture. The course will also include student presentations of their ongoing research. By the end of this course, a student should be able to: explain in-depth the topics covered during the course, describe and discuss research publications in a wide variety of disciplines within the life sciences, critically analyze, interpret and evaluate scientific publications or presented research updates, identify and present emerging topics in their field of interest (as defined by the research of their mentor). The course is for PREP-UT Health Link students.

INTD 6040. Resident Lecture Series in Psychiatric Disorders and Psychopharmacology. 1 Credit Hour.

This is an interdisciplinary advanced elective in which students attend 17 lectures from the Psychiatry Year One Residents' lecture series. These lectures focus on the psychopathology, epidemiology, and pharmacological treatments for illnesses such as schizophrenia, anxiety disorders, trauma related disorders, eating disorders, and sleep disorders.

INTD 6041. Basic Science Resident Lecture Series In Neurology. 1.5 Credit Hour.

This is an interdisciplinary advanced elective in which students attend 20 lectures, selected from the full offering of daily one-hour lectures comprising the Neurology Residents' Basic Sciences lecture series. These lectures cover a range of topics, such as Epilepsy, Movement Disorders, the Thalamus, Parkinson's Disease, Alzheimer's Disease, Stroke, Sleep, etc., all given from a clinical perspective. In addition, graduate students will have the opportunity to observe or participate in at least two enrichment activities related topically to the lectures they attend, which may include such settings as case presentations, diagnostic training sessions, or clinical observations, again selected from the list of offerings included in the "Neurology Residents" series.

INTD 6045. Clinical Practicum In Neuroscience. 1 Credit Hour.

This course will provide students with a brief, but intense and very focused exposure to clinical practice in a relevant area of their choosing, designed and coordinated to best match their interests in close individual collaboration with a clinical mentor in one of the participating components: Neurosurgery, Neurology, Psychiatry, or Endodontics. Representative activities could include participation in case presentation and treatment planning, attending rounds with physicians and residents, direct observation of clinical procedures, patient interviews, follow-up care and outcome review. Potential venues may include inpatient psychiatric ward, sleep clinic, epilepsy clinic, stroke clinic, neurosurgical theater and surgical ICU. In consultation with the course director, students will first select one of the following sub-sections, then design their individually tailored clinical practicum experience with the coordinator for that section.

INTD 6046. Resident Lecture Series in Psychiatric Disorders and Psychopharmacology II. 1 Credit Hour.

This is an interdisciplinary advanced elective in which students attend lectures, selected from the full offering of weekly two-hour lectures comprising the Psychiatry Year One Residents' lecture series. These lectures cover a range of topics, such as Substance Abuse, Depression, Bipolar Disorder, etc., all given from a clinical perspective.

INTD 6062. Next-Generation Sequencing Data Analysis. 2 Credit Hours.

Next-generation sequencing (NGS) is becoming increasingly commonplace in biomedical research. For many labs, the main bottleneck to implementing NGS applications is data analysis. This course is designed to introduce students to bioinformatics analysis of NGS data. The course consists of two modules: the first module covers working in the Unix/Linux environment, mapping NGS data to a genome of interest, and performing downstream analysis of RNA-seq, ChIP-seq, and ATAC-seq data. The second module will be an introduction to the programming language Perl, which will enable students to perform custom bioinformatics analysis. This course will be taught in the form of interactive hands-on computer classes. No prior knowledge of programming or coding is required.

INTD 6070. Teaching Excellence And Academic Skills (Texas). 1 Credit Hour.

This course, designed to assist graduate students and faculty in acquiring teaching skills, is composed of four modules, each covering a range of topics from lecture and clinical teaching to instructional development to assessing student achievement.

INTD 6075. Practical Machine Learning. 2 Credit Hours.

This practical approach to machine learning in the biomedical sciences will be mostly problem set- and discussion-based. Background information will be delivered in short lectures on datasets and machine learning concepts. Our plan is to discuss encoding data, training models, and evaluating model performance, including dimensionality reduction, regularization to reduce overfitting, and optimization of method hyperparameters through grid and random searches, with models drawn from linear and logistic regression, random forest classifiers, multi-layer perceptrons, neural networks (feed-forward, recurrent, graph, convolutional, and adversarial), and variational auto-encoders. Each problem set will cover a different area, including chemical structures and properties, metabolite profiles and cancer diagnosis, DNA sequence and transcription factor binding sites, and intratumoral gene expression and patient survival. One problem set and one 2-hour discussion (30 minutes lecture, 30 minutes concept discussion, 1hr problem set progress discussion) every week. The final problem set will be a capstone project where the students implement methods of their own choosing and compete to achieve the best model performance. Open for Cross Enrollment on Space Available Basis.

INTD 6076. Translational Biomedical Product Development. 1 Credit Hour.

Translational Biomedical Product Development is a course that will provide students with an understanding of the overall process of translating basic research into innovative, market-driven biomedical products (therapeutics, biologics, diagnostics, and devices). It covers the complex pathways of intellectual property management and the regulatory processes by which a bioscience product is developed and brought to commercialization. Focused lectures will include pre-clinical development, patenting, FDA and regulatory requirements, clinical trials, marketing, funding, licensing, and commercialization strategies. Case studies of both successful and unsuccessful biomedical products will be presented to explore various business development opportunities. Upon successful completion of this course, students will have a comprehensive knowledge of the complex regulatory ecosystem of biomedical product development and management. Prerequisites include appropriate undergraduate courses in Biochemistry, Molecular Biology or Pharmacology, as assessed by the course director. Prerequisites: BIOC 6035 Open for Cross Enrollment on Space Available Basis.

INTD 6085. Advanced Machine Learning. 2 Credit Hours.

This advanced approach to machine learning in the biomedical sciences will be mostly problem set- and discussion-based. Background information will be delivered in short lectures on datasets and machine learning concepts. Our plan is to discuss advanced regularization techniques, convolutional and recurrent neural networks, generative adversarial networks, reinforcement learning and attention, transformer and NLP models, explainable AI, and ethical considerations. Each problem set will cover a different area of biomedical research. One problem set and one 2-hour discussion (30 minutes lecture, 30 minutes concept discussion, 1hr problem set progress discussion) every week. The final problem set will be a kaggle competition where the students implement methods of their own choosing and compete to achieve the best model performance. Prerequisites: INTD 6075 Open for Cross Enrollment on Space Available Basis.

INTD 6097. Research. 0.5-12 Credit Hours.

This course is intended for first-year IMG students only. Students will be required to attend a minimum of 10 departmental (any) seminars during the semester and submit a 100-150 word synopsis of each seminar within two weeks of the seminar.

INTD 6115. Perio/Pros/Endo/Ortho Interdisciplinary Course 3. 1 Credit Hour.

This is a seminar that brings together the residents and graduate staff from the periodontic, prosthodontic, endodontic and orthodontics postdoctoral programs to share clinically relevant multidisciplinary information. Patient diagnostic evaluations and treatment plans are evaluated in an interactive environment. Selected topics involving new advancements are presented and discussed.

INTD 7001. Flow Cytometry: Principles and Applications. 2 Credit Hours.

This course will cover the principles of flow cytometry, the components of cell analyzers and cell sorters, the applications of different assays in flow cytometry and the interpretation of flow cytometry data. Flow cytometry plays an essential role in helping to elucidate cell phenotype characterization and function in both clinical and research settings. The purpose of this course is to bring students up-to-date on the technology of flow cytometry and to help them gain knowledge in how to apply this tool for patient diagnosis as well as basic and translational research.

INTD 7002. Neurobiology Of Learning And Memory. 1 Credit Hour.

This course will focus on recent findings and topics related to the underlying aspects of the neural basis of learning and memory. Students will have the opportunity to learn about: molecular basis of memory formation, consolidation and retrieval, memory and emotion, associative learning, memory and amnesia, and recognition memory and the medial temporal lobe. The lectures will be interactive and driven by discussions of key journal articles. Each week the first hour will be reserved for lecturing and the second hour will be reserved for a discussion of a journal article.

INTD 7003. Elective in International Medicine. 4 Credit Hours.

This elective serves as a vehicle for students to participate in international medicine rotations. Students will work with a faculty sponsor to identify a program, either a pre-established site or a site discovered by the student which requires faculty approval. This elective includes: 1) The Center for Medical Humanities and Ethics International Scholars Program in India, a competitive program requiring a separate application through the department of Medicine, 2) Shoulder to Shoulder program in Latin America, which requires a separate application process and some cost (airfare and small project fee), and is available October, January, and April, 3) Programs in Nicaragua, Mexico, Panama, and Guatemala, and 4) Other sites available through online directory: <http://www.globalhealth-cc.org/GHEC/Resources/GHonline.htm>. All rotations share a commitment to service learning - medical education and self-reflection that arises out of service to needy populations. Students spend up to 4 weeks (or possibly longer) living in an international site and participating in the care of patients, under the supervision of local and visiting health care providers. The clinical settings and caseload will vary based on the location. There may be opportunities for patient education and emphasis on efforts of local empowerment, aiming to build up the communities in a sustainable way. Students will be expected to integrate themselves into the health care delivery system, and when possible, to strive to make an impact through community education and home visits. For certain Latin American sites, fluency in Spanish is a prerequisite. Students are encouraged to seek similar service learning experiences with underprivileged populations in San Antonio and Border communities prior to or after the rotation. End of rotation "reflection essays" are required and will serve to process student experiences.

INTD 7005. Indian Health Care Preceptorship. 4 Credit Hours.

This elective offers the opportunity for an experience in the health care of Native Americans, coordinated through the Indian Health Service. Most experiences involve both inpatient and outpatient care under direct supervision of board certified family physicians or internists. Educational activities such as conferences, teaching rounds, etc., may vary from site to site. All clinical sites are located outside the state of Texas, including sites in New Mexico, Arizona and Alaska. Early application is recommended. Students completing appropriate application forms may be reimbursed for transportation costs and provided room and board by the Indian Health Service.

INTD 7006. Biomarkers in Health Care Research and Delivery. 1 Credit Hour.

This course provides a broad overview of the rapidly evolving use of biomarkers in health care research and health care delivery. Biomarkers are non-subjective (i.e., not symptom scores, disability scales, or diagnoses) physical or functional measurements that serve as quantitative indices of physiological processes, pathological processes, and responses to exposures or interventions (including therapeutic interventions) that are intended to enhance the rigor and reproducibility of health care research and care delivery. Federal agencies, including the Food and Drug Administration (FDA), the National Institutes of Health (NIH) and the Institute of Medicine (IOM) are deeply engaged in promoting the use of biomarkers, introducing multiple funding opportunities for biomarker development toward FDA qualification and/or regulatory approval for clinical use. Additionally, opportunities for commercial partnership during biomarker development will be discussed. Examples will be provided of fluid (serum, CSF, urine, etc.), tissue, imaging, and biometric biomarkers (including wearable devices). Course format will emphasize assigned readings/viewings from various sources (IOM white papers, FDA & NIH video and powerpoint presentations, recent biomarker validation publications, current biomarker qualification submissions, relevant regulatory guidance, funded-grant synopses, et cetera) followed by in-class review and discussion. Special topic lectures will be delivered by invited speakers ranging from established biomarker researchers to regulatory experts. Open for Cross Enrollment on Space Available Basis.

INTD 7007. Medicine through Literature. 2 Credit Hours.

In this course you are required to read short stories, poems, and a book of nonfiction. While many of the stories or poems directly address medical or ethical issues, the primary purpose is not to enhance your store of knowledge in these areas, but to promote your appreciation of these works through discussions with other students (online via Canvas discussions and in class) and with authors and lecturers. Your own contributions to the course - not just the insights you've gained as medical students but the wisdom you bring to the class as human beings - will be critical to its success. We hope that the readings will help you prepare for and process your clinical experiences, furthering your development as a person as well as physician. There will be no "right" or "wrong" answers in this course; rather, our goal is to encourage thoughtful and serious responses to the readings and a lively and fulfilling conversation about them and the issues they raise. MSIV students will receive two credits for completion of this longitudinal elective. All students are expected to participate in class discussions. Grades are earned by reading assignments, attendance at class meetings, and posting primary and secondary responses to posted discussion questions. Open for Cross Enrollment on Space Available Basis.

INTD 7009. HIV Out Loud: Building the History of an Epidemic. 2 Credit Hours.

This course acquaints students with oral history methods and specifically with the history and lived experience of HIV. Students will learn how to record oral history and will work closely with people living with HIV, advocates and family members to record a life history for the permanent "HIV Out Loud" archive in the Briscoe Library. Students will participate in 1 in-person orientation meeting and 3 required in-person sessions in which students will receive training on best practices and learn to record oral history. Subsequently, to receive credit for the course students will be required to attend 2 community events (such as tabling at World AIDS Day, attending HIV advocacy day, presenting on the project, etc), attend 3 virtual listening sessions, and either record an oral history for the archive or produce a paper or educational/analytical tool that uses the materials already archived. This course is a great fit for trainees interested in history, in HIV itself, and in advocacy.

INTD 7020. Clinical Patient Management. 4 Credit Hours.

This course is designed to help students develop skills in clinical behavioral dentistry through small group discussions, lectures, and routine patient treatment by application of the principles of coordinating patient care; communicating effectively with colleagues, staff, and faculty; and managing time, records, and environment. The students are required to manage their comprehensive care patients in the Junior Clinic following the principles presented in this course.

INTD 7030. Tumor Immunology Working Group and Journal Club. 1 Credit Hour.

The Tumor Immunology Working Group and Journal Club is an advanced, interactive course designed for graduate students, postdoctoral fellows, and faculty with a keen interest in the field of tumor immunology. This course aims to foster a deep understanding of the intricate interactions between the immune system and cancer, exploring both the fundamental concepts and the latest advancements in cancer immunotherapy through research updates and cancer immunology-related papers. Additionally, it seeks to promote collaboration among participants and establish a student peer group with research interests in tumor immunology. Open for Cross Enrollment on Space Available Basis.

INTD 7040. Advancing Social Communication and Play. 1 Credit Hour.

Advancing Social-Communication and Play (ASAP) is a classroom-based intervention program designed to help teachers, therapists and paraprofessionals foster the development of important communication and play skills in children with autism spectrum disorders (ASD). This course equips the Project ASPIRE Scholars with essential knowledge and skills necessary for effectively applying the ASAP intervention approach within a classroom environment. Prerequisites: OCCT 7029 and OCCT 7115.

INTD 7050. Gross Anatomy. 6 Credit Hours.

This course provides a complete and detailed study of the structure and function of the human body including the study of human cadavers through guided dissections and dissection. The course is designed for the Doctor of Occupational Therapy (DOT) and Doctorate of Physical Therapy (DPT) programs and will focus on material most pertinent to the practice of OT and PT. Students will apply their theoretical understanding of clinically relevant structures and common disorders to their therapeutic practice. Course fees: \$831.

INTD 7074. Topics In Translational Medical Product Development. 1 Credit Hour.

It is crucial to understand the intricate process of translating basic research into market driven products, navigate the complex pathways of intellectual property management and the regulatory affairs of agencies such as the FDA. This course will offer students in biomedical sciences the opportunity to integrate industry-relevant training and experience with their basic science education. The course will explore the marketing and regulatory process by which a biomedical product is developed and brought to commercialization.

INTD 7091. Independent Studies. 1-9 Credit Hours.

Students will have the opportunity to use this course to study for the National Board, Part II examination, according to their own need. This course also will serve as a framework for a student returning from a leave of absence or from other protracted time away from classes or clinic. At the conclusion of the course, the enrolled student must demonstrate knowledge and/or skills and/or values consistent with the expectations for entering the level of course study from which the student left. An individualized course of study will be developed once the student is enrolled.

Courses**PATH 4001. Hematology - University Hospital. 4 Credit Hours.**

During this selective, through daily experience, consultations, and conferences, students will have the opportunity to learn to use CBCs, blood films, bone marrow studies, and other hematologic laboratory data in the diagnosis of basic hematologic, lymphoid, and coagulation disorders. This selective can be tailored according to the needs of individual students. The student interested in primary care can become involved in the performance of common laboratory tests done in the office. Daily contact with the pathologist will provide guidance in selection and proper utilization of laboratory testing for a specific patient's problem. For the student interested in pathology and laboratory medicine, the organization, management, maintenance of quality control, and consultative role of the Hematology Laboratory will be emphasized. During the selective period, a student may be assigned to spend one week in flow cytometry, molecular genetics, or cytogenetics.

PATH 4002. Blood Banking. 4 Credit Hours.

This elective is to acquaint the student with transfusion practices including the collection, manufacture, indications, dosage, expected benefits and risks of the different blood components, as well as the performance of therapeutic apheresis. The student will also be exposed to basic immuno-hematology and blood-banking techniques of acquiring, processing, testing, and transfusing blood components. Under the direction of the pathologist, a transfusion medicine fellow, a pathology resident, and a technical specialist in blood banking, the student will be required to perform basic techniques, participate in resolving the problems of patients having difficulties in transfusion, and evaluate the appropriateness of transfusion. The elective can be tailored to offer more experience in transfusion practices for patient care or in organization, management, quality control, and other factors important to the student who may consider laboratory medicine as a chosen field. Students are required to participate in consultations, education programs offered by the blood bank and expected to do a brief presentation at the Clinical Pathology Laboratory Medicine Report didactic conference. This elective is available to second year students after they have completed their preclinical coursework. Permission is required to register.

PATH 4003. Hematology/Blood Banking. 4 Credit Hours.

This combination selective between the Hematology Laboratory and the Blood Bank may be arranged if student so desires.

PATH 4012. Cytopathology. 4 Credit Hours.

During this elective, through daily experience, consultations, and conferences, students will be exposed to various cytopathology specimens obtained from various anatomic sites and observe rapid on-site reviews of pathologic material obtained by pathologist performed, radiologically guided or endoscopically guided aspiration procedures. Students are required to learn basic staining with preliminary evaluation for adequacy of aspirate. There will be exposure to basic interpretation of cytologic specimens (smears and cell blocks) with emphasis on selection of ancillary testing along with clinical correlation. The experience may be customized depending on the student's future interests (pathology as a future vocation versus students planning on other fields of medicine). This elective is available to second year students after they have completed their preclinical coursework. Permission is required to register.

PATH 4013. General Pathology Rotation (an overview of Anatomic and Clinical Pathology). 2 Credit Hours.

Pathologists play many roles in medicine. Roles range from interpreting surgical biopsies to supervising clinical laboratory testing. It has been estimated that 70% of all medical decisions are based on data generated by pathology departments. This elective is designed to introduce the student to the practice of pathology and the role of the pathologist in diagnosis and management, and will provide exposure to several subspecialty areas within the pathology department. This rotation is intended either for those interested in pathology as a career, and those interested in broadening their understanding of pathology in general, or in relation to their chosen field. This two or four week elective will expose the medical student to the fields of Anatomic and Clinical Pathology including surgical pathology, cytopathology, autopsy pathology, hematopathology, transfusion medicine, and microbiology. In anatomic pathology, students will have the opportunity to partake a range of experiences, including supervised observation or active participation of prosection of surgical specimens, microscopic evaluations, frozen section evaluations, participate and observe in immediate adequacy assessment of samples for image guided fine needle aspirations/ core needle biopsies and participate in autopsy procedures as available. In clinical pathology, the student will participate in the diagnosis of blood and bone marrow disorders, transfusion reaction evaluation and provision of blood, among other experiences. In general, students will attend: 1) an introductory guided tour of clinical and anatomic laboratories/ departments with an overview of diagnostic testing and methods, 2) required lectures and teaching sessions 3) and at least 2 multidisciplinary case conferences (tumor boards). At the end of the rotation, students are expected to deliver a 10-20 minute presentation at the clinical pathology conference (laboratory medicine conference) and/or the anatomic pathology grand rounds conference. Open for Cross Enrollment on Space Available Basis.

PATH 4015. Forensic Pathology. 2 Credit Hours.

Daily responsibilities include the observation of forensic autopsies. Other responsibilities will include crime scene attendance, courtroom, and/ or deposition exposure. The student will be assessed by attendance, type and frequency of activities performed, and subjective evaluations by the medical examiner staff. This forensic pathology rotation must be pre-approved by the course director for both time period and length of rotation; recommended during the fourth year of medical school following core rotation in general autopsy and surgical pathology, though those rotations are not required. This elective is available to second year students after they have completed their preclinical coursework. Permission is required to register.

PATH 4104. Naturopathic Medicine: Evidence-Based Critique. 0.5 Credit Hours.

This course strives to overcome the animosity between conventional and unconventional medicine by openly discussing and evaluating some of the naturopathic methods using the tools of evidence-based medicine. The objective of this course is to build basic knowledge about the mainstreams of naturopathic medicine such as fito-therapy, acupuncture and other reflexologies, Asian and European dietary systems, as well as stimulatory methods such as fasting and homeopathy. For each of these systems, diagnosis and treatment will be discussed from the evidence-based perspective.

PATH 4105. Evidence Based Medicine In Everyday Practice. 0.5 Credit Hours.

This course includes theory and methodological foundation, definitions and overview of evidence-based medicine, practical considerations, and reporting in evidence-based medicine.

PATH 4290. Clinically Applied Laboratory Medicine (CALM). 0.5 Credit Hours.

This course is an eleven-contact-hour mandatory course in laboratory medicine for MSIV students. Offered during the spring semester, the course is taught by members of the Pathology Department using patient case scenarios to illustrate laboratory medicine aspects of patient care management. An introductory one-hour lecture is presented to the entire class as a whole to provide course format information and small-group assignments. Groups of twenty-five to thirty students are formed based upon medical/surgical specialties; a student is assigned to a group according to chosen specialty. Patient cases are selected to emphasize important laboratory medicine points pertinent to a particular specialty.

PATH 5030. Oral Histopathology. 1 Credit Hour.

The course will review the histopathologic features of oral diseases. Cases signed-out on the Oral & Maxillofacial Pathology Biopsy Service will be discussed in a conference format utilizing a multiheaded microscope. Correlation of the histologic findings with the clinical and radiographic presentation of oral disease processes will be emphasized. Students will have the opportunity to learn the basis of surgical pathologic diagnosis and related ancillary special studies.

PATH 5035. Oral Pathology. 2 Credit Hours.

Clinicopathologic correlations, differential diagnosis, and therapeutic rationale are emphasized. The integration of history, physical findings, and clinical laboratory data with pertinent radiographic findings, clinical presentations, and anatomic pathology will be emphasized.

PATH 6026. Graduate Oral and Maxillofacial Pathology - Clinicopathologic Conference 1. 1 Credit Hour.

This course is presented in the first semester and consists of 16 one-hour sessions of instruction conducted as case conferences utilizing radiographic, histopathologic, and clinical projected glass slides and Kodachromes. Students present assigned literature reviews and cases emphasizing radiographic and histopathologic changes; discussions follow. Students include those from Oral and Maxillofacial Surgery, Periodontics, Endodontics, and Dental Diagnostic Sciences.

PATH 6027. Graduate Oral and Maxillofacial Pathology Clinicopathologic Conference 2. 1 Credit Hour.

This course is a continuation of PATH 6026 Grad Oral/Maxillofacial Path 1. It is presented in the second semester and consists of 17 one-hour sessions of instruction conducted as case conferences utilizing radiographic, histopathologic, and clinical projected glass slides and Kodachromes. Students present assigned literature reviews and cases emphasizing radiographic and histopathologic changes; discussions follow. Students include those from Oral and Maxillofacial Surgery, Periodontics, Endodontics, and Dental Diagnostic Sciences. Prerequisite: PATH 6026.

PATH 7000. Off Campus. 4 Credit Hours.

All off campus rotations must be approved by the designated faculty member prior to the beginning of the rotation (at least one week before the course begins). Credit will not be given for any rotation that has not been approved in advance. Required paperwork includes: "Course Approval" form, a written letter or email for acceptance from the physician preceptor with the start and end dates of the course/rotation, and a course description of your learning objectives and responsibilities during the rotation. Forms must include a complete address and telephone number for the off campus location or residence address for the student while at the off campus site. Forms will not be approved after the rotation has already begun. Contact the department for assistance with enrolling in this course.

PATH 7023. Oral & Maxillofacial Pathology: Clinicopathologic Conference. 1 Credit Hour.

This course is a series of 14 clinicopathologic conferences presented in an interactive case-based/clinical problem-solving format. Students will be expected to apply their fund of basic science knowledge learned in the prerequisite didactic pathology courses to simulated dental practice situations. Cases will be discussed systematically utilizing the S.O.A.P. format (Subjective, Objective, Assessment, Plan). Students are required to complete and turn in a worksheet and self assessment for each case. Students are expected to read articles from current scientific literature posted on the course site and take the online challenge examinations. Lectures on the critical topics of head and neck cancer and skin cancer will be given by the course director.

Courses**PERI 5010. Clinical Periodontics 1. 2 Credit Hours.**

Students have the opportunity to gain clinical experience as they treat patients in the postdoctoral clinic. Cases gradually increase in complexity and severity and include treatment of the medically compromised patient, implant cases, and interdisciplinary cases.

PERI 5012. Clinical Periodontics 1. 1 Credit Hour.

Students have the opportunity to gain clinical experience as they treat patients in the postdoctoral clinic. Cases gradually increase in complexity and severity and include treatment of the medically compromised patient, implant cases, and interdisciplinary cases.

PERI 5025. Case Presentation Seminar. 0.5 Credit Hours.

The course consists of presentation of clinical cases. Students have the opportunity to prepare to defend their approaches to therapy and gain experience in oral presentation of cases.

PERI 5031. Periodontics Lecture Series. 2 Credit Hours.

This course is designed to instruct the student in all aspects of periodontology. It is meant to be an adjunct to the PERI 6073 Literature Seminar. Topics dealing with basic science, pathobiology, and clinical and surgical aspects of periodontal disease will be discussed.

PERI 5035. Peri Lecture Series. 1.5 Credit Hour.

This course is designed to instruct the student in all aspects of periodontology. It is meant to be an adjunct to the PERI 6073 Literature Seminar. Topics dealing with basic science, pathobiology, and clinical and surgical aspects of periodontal disease will be discussed. Cross-listed/ Concurrent: PERI 6030/6031.

PERI 5037. Bone & Connective Tissue Biology. 0.5 Credit Hours.

This course seeks to apply current principles of bone and periodontal ligament cell biology to our understanding of the development, maintenance, and repair of periodontal tissues and to the clinical management of pathology at the tooth supporting structures. Emphasis is placed on the basic cell and structural biology which provides the underlying rationale for current and experimental approaches to periodontal disease and therapies.

PERI 5052. Surgical Anatomy. 1 Credit Hour.

This course emphasizes the learning of the head and neck anatomy that is related directly to surgical procedures performed by periodontists and endodontists and the practice of prosthodontic dentistry. Anatomic structures related to implant placement receive special emphasis. Surgical complications related to anatomy are described. A prosection on human cadavers is presented with a strong emphasis on surgical anatomy.

PERI 5073. Literature Seminars. 1 Credit Hour.

This course is designed to familiarize the student with the historical and contemporary literature related to periodontics. The first-year course is concerned mainly with basic science literature while second- and third-year courses concentrate on the clinical literature. Students have the opportunity to evaluate the data in the literature, critique experimental design, abstract articles, critically evaluate research findings, and learn to use library resources.

PERI 5074. Current Lit Seminar. 1-5 Credit Hours.

Current periodontal literature published during the academic year is discussed in a seminar format.

PERI 5075. Mock Boards. 0.5 Credit Hours.

This course is a simulation of the exams given by the American Board of Periodontology. Students present their cases orally, with slides, to faculty examiners and take an oral examination.

PERI 5097. Research. 1-9 Credit Hours.

This course consists of independent, original research under the direction of a faculty member.

PERI 6000. Introduction to Advanced Periodontics for Interns. 1 Credit Hour.**PERI 6001. Periodontic Practice Management. 0.5 Credit Hours.**

The objective of this course is to prepare the student for the business aspects of clinical practice. The student will be exposed to the banking finances, practical aspects of office management, matters relating to dental insurance, and the different types of practice.

PERI 6009. Clinical Periodontics 2. 2 Credit Hours.

Students have the opportunity to gain clinical experience as they treat patients in the postdoctoral clinic. Cases gradually increase in complexity and severity and include treatment of the medically compromised patient, implant cases and interdisciplinary cases.

PERI 6011. Clinical Periodontics 2. 3 Credit Hours.

Students have the opportunity to gain clinical experience as they treat patients in the postdoctoral clinic. Cases gradually increase in complexity and severity and include treatment of the medically compromised patient, implant cases, and interdisciplinary cases.

PERI 6012. Clinical Periodontics 3. 4.5 Credit Hours.

Students have the opportunity to gain clinical experience as they treat patients in the postdoctoral clinic. Cases gradually increase in complexity and severity and include treatment of the medically compromised patient, implant cases, and interdisciplinary cases.

PERI 6016. Clinical Periodontics 3. 2 Credit Hours.

Students have the opportunity to gain clinical experience as they treat patients in the postdoctoral clinic. Cases gradually increase in complexity and severity and include treatment of the medically compromised patient, implant cases, and interdisciplinary cases.

PERI 6020. Emergency Care Seminar. 0.5 Credit Hours.

This is a pragmatic course to familiarize the student with the medical emergencies that the clinician may incur while practicing dentistry. Major texts on the medically compromised patient are used as a guideline. The course is given in seminar format.

PERI 6025. Case Presentation Seminar. 0.5 Credit Hours.

The course consists of presentation of clinical cases. Students have the opportunity to prepare to defend their approaches to therapy and gain experience in oral presentation of cases.

PERI 6030. Periodontic Lecture Series. 2 Credit Hours.

This course is designed to instruct the student in all aspects of periodontology. It is meant to be an adjunct to the PERI 6073 Literature Seminar. Topics dealing with basic science, pathobiology, and clinical and surgical aspects of periodontal disease will be discussed.

PERI 6031. Periodontic Lecture Series. 2 Credit Hours.

This course is designed to instruct the student in all aspects of periodontology. It is meant to be an adjunct to the PERI 6073 Literature Seminar. Topics dealing with basic science, pathobiology, and clinical and surgical aspects of periodontal disease will be discussed.

PERI 6033. Peri Lecture Series. 1 Credit Hour.

This course is designed to instruct the student in all aspects of periodontology. It is meant to be an adjunct to the PERI 6073 Literature Seminar. Topics dealing with basic science, pathobiology, and clinical and surgical aspects of periodontal disease will be discussed. Concurrent: PERI 5031 and PERI 6031.

PERI 6036. Peri Lecture Series. 1 Credit Hour.

This course is designed to instruct the student in all aspects of periodontology. It is meant to be an adjunct to the PERI 6073 Literature Seminar. Topics dealing with basic science, pathobiology, and clinical and surgical aspects of periodontal disease will be discussed. Concurrent: PERI 5031 and PERI 6031.

PERI 6050. Periodontal Medicine. 1 Credit Hour.

This course is designed to establish the principles essential for problem-oriented evaluation of the dental patient. The intent is to discuss the diagnosis of selected common orally related primary and secondary mucocutaneous conditions and oral cancer and their management.

PERI 6070. Supervised Teaching. 0.5 Credit Hours.

Graduate students are assigned to the various clinics and classes for the opportunity to acquire experience in teaching pre-doctoral students and faculty members in a variety of situations. Supervision and evaluation of teaching performance are provided by the graduate faculty.

PERI 6071. Supervised Teaching. 0.5 Credit Hours.

Graduate students are assigned to the various clinics and classes for the opportunity to acquire experience in teaching pre-doctoral students and faculty members in a variety of situations. Supervision and evaluation of teaching performance are provided by the graduate faculty.

PERI 6072. Supervised Teaching. 0.5 Credit Hours.

Graduate students are assigned to the various clinics, laboratories, and classes for the opportunity to acquire experience in teaching undergraduate students in a variety of situations. Supervision and evaluation of teaching performance are provided by the graduate faculty.

PERI 6073. Literature Seminars. 1 Credit Hour.

This course is designed to familiarize the student with the historical and contemporary literature related to periodontics. The first-year course is concerned mainly with basic science literature while second- and third-year courses concentrate on the clinical literature. Students have the opportunity to evaluate the data in the literature, critique experimental design, abstract articles, critically evaluate research findings, and learn to use library resources.

PERI 6074. Current Lit Seminar. 0.5-5 Credit Hours.

Current periodontal literature published during the academic year is discussed in a seminar format.

PERI 6075. Mock Boards. 0.5 Credit Hours.

This course is a simulation of the exams given by the American Board of Periodontology. Students present their cases orally, with slides, to faculty examiners and take an oral examination.

PERI 6097. Research. 1-9 Credit Hours.

This course consists of independent, original research under the direction of a faculty advisor.

PERI 6098. Thesis. 1-9 Credit Hours.

Completion of an acceptable thesis is required for the Master of Science degree. Registration in this course for at least one semester is required of all degree candidates. Prerequisites: admission to candidacy for the Master of Science degree.

PERI 7059. Implantology. 1 Credit Hour.

Through lecture sessions, this introductory course offers students an opportunity to obtain both background and knowledge regarding accepted dental implant systems.

PERI 7081. Periodontics. 1.5 Credit Hour.

This course is an expansion of the foundation presented in the sophomore year. Surgical treatment planning, rationale, techniques, and wound healing are emphasized. A three-hour surgical laboratory exercise is included. Periodontal interrelationships with prosthodontics, endodontics, and orthodontics are examined in case presentation formats with student participation.

PERI 8015. Periodontics. 0.5 Credit Hours.

This lecture course is a comprehensive review of current periodontal topics. Topics include those that should be employed in the diagnosis, treatment planning, and management of periodontal diseases in a general dentistry practice setting. Both non-surgical and surgical treatment approaches will be discussed.

PERI 9097. Research. 4 Credit Hours.

The student develops a research protocol and background literature search for a clinical, laboratory, or animal model research project.

Courses

PROS 5015. Concepts Of Occlusion. 1 Credit Hour.

Various concepts of occlusion with special emphasis on the clinical application of gnathology are the focus of this course. The laboratory phase includes the development of a functional occlusion through the cusp-fossa additive wax method and an occlusal equilibration technique.

PROS 5021. Advanced Prosthodontics 1. 1 Credit Hour.

This fall course for first-year advanced prosthodontics students is designed to provide the postdoctoral student with the didactic basis for advanced clinical prosthodontics care.

PROS 5022. Advanced Prosthodontics 1. 1 Credit Hour.

This spring course for first-year advanced prosthodontics students is designed to provide the postdoctoral student with the didactic basis for advanced clinical prosthodontics care.

PROS 5032. Clinical Prosthodontics I. 4 Credit Hours.

This fall course for first-year advanced prosthodontics students is designed to provide extensive clinical experience in the broad spectrum of prosthodontics as a first course in a progressively more complex clinical prosthodontics curriculum. Each student will have the opportunity to maintain a comprehensive prosthodontics practice involving fixed, removable, and implant treatment procedures.

PROS 5033. Clinical Prosthodontics I. 3 Credit Hours.

This spring course for first-year advanced prosthodontics students is designed to provide extensive clinical experience in the broad spectrum of prosthodontics as a second course in a progressively complex clinical prosthodontics curriculum. Each student will have the opportunity to maintain a comprehensive prosthodontics practice involving fixed, removable, and implant treatment procedures.

PROS 5044. OMS/Prosthodontics Seminar 1. 0.5 Credit Hours.

This fall course for first-year prosthodontics students is a seminar devoted to the discussion and coordination of treatment of patients under joint management by Oral & Maxillofacial Surgery and Graduate Prosthodontics.

PROS 5045. OMS/Prosthodontics Seminar 1. 0.5 Credit Hours.

The spring course for first-year prosthodontics students is a seminar devoted to the discussion and coordination of treatment of patients under joint management by Oral & Maxillofacial Surgery and Graduate Prosthodontics.

PROS 5049. Overview of Maxillofacial Pros. 0.5 Credit Hours.

This course introduces the graduate student to the discipline of maxillofacial prosthetics. Emphasis is placed on treating patients requiring prosthetic devices for the head and neck area due to surgery or trauma.

PROS 5050. Dental Implantology. 1 Credit Hour.

This course offers graduate level students an introduction to the basics of the osseointegrated implant surgical and prosthetic technique. Lectures on advanced concepts of osseointegration therapy related to several implant systems are included.

PROS 5053. Advanced Implant Prosthodontics. 1.5 Credit Hour.

The objective of this course is to offer each student an opportunity to obtain background information, knowledge, and skills associated with dental implant treatment modalities.

PROS 5054. Advanced Dental Materials. 3.5 Credit Hours.

Students have an opportunity to become acquainted with sophisticated research equipment through hands-on exposures. Measurements of mechanical, physical, and chemical properties of commonly used dental materials give the student the opportunity to envision and formulate research projects in dental materials.

PROS 5067. Supervised Teaching 1. 1.5 Credit Hour.

This course provides first-year prosthodontic residents the opportunity to teach complete denture laboratory skills to predoctoral students under the supervision of experienced prosthodontic educators.

PROS 5068. Supervised Teaching 1. 2 Credit Hours.

This spring course provides first-year prosthodontic residents the opportunity to teach complete denture laboratory skills to predoctoral students under the supervision of experienced prosthodontic educators.

PROS 5072. Literature Review Seminar 1. 1 Credit Hour.

This fall course for first-year prosthodontics students is the first of six courses given in a three-year continuum of classical literature review seminars. The broad field of prosthodontics literature is systematically reviewed with the objective of providing the postdoctoral student with a background of prosthodontic knowledge and history.

PROS 5073. Literature Review Seminar 1. 1 Credit Hour.

This spring course for first-year prosthodontic students is the second of six courses given in a three-year continuum of classical literature review seminars. The broad field of prosthodontics literature is systematically reviewed with the objective of providing the postdoctoral student with a background of prosthodontic knowledge and history.

PROS 5095. Research. 1 Credit Hour.

This summer course for advanced prosthodontics students is the first of three in the first year designed to offer opportunity to review the literature and to design and complete a laboratory or clinical research project under the direction of a faculty advisor. Research should result in a paper by certificate students suitable for publication in a peer-rated journal. Students in the masters programs will be expected to collect and analyze data for a thesis that must be defended as the culmination of research efforts.

PROS 5096. Research. 1 Credit Hour.

This summer course for advanced prosthodontics students is the second of three in the first year designed to offer an opportunity to review the literature and to design and complete a laboratory or clinical research project under the direction of a faculty advisor. Research should result in a paper by certificate students suitable for publication in a peer-rated journal. Students in the master's degree programs will be expected to collect and analyze data for a thesis that must be defended as the culmination of research efforts.

PROS 5097. Research 1. 1-9 Credit Hours.

This course offers the student an opportunity to review the literature and to design and complete a laboratory or clinical research project under the direction of a faculty advisor. Research should result in a paper by certificate students suitable for publication in a peer-rated journal. Students in the master's programs will be expected to collect and analyze data for a thesis which must be defended as the culmination of research efforts.

PROS 6000. Introduction to Advanced Prosthodontics for Interns. 1 Credit Hour.**PROS 6022. Advanced Prosthodontics 2. 1 Credit Hour.**

This fall continuation course for second-year advanced prosthodontic students is designed to provide the postdoctoral student with the didactic basis for advanced clinical prosthodontic care.

PROS 6023. Advanced Prosthodontics 2. 1 Credit Hour.

This spring continuation course for second-year advanced prosthodontics students is designed to provide the postdoctoral student with the didactic basis for advanced clinical prosthodontic care.

PROS 6031. Clinical Prosthodontics 2. 4.5 Credit Hours.

This fall course for second-year advanced prosthodontic students is designed to provide extensive clinical experience in the broad spectrum of prosthodontics as a third clinical course in a progressively complex clinical prosthodontic curriculum. Each student will have opportunity to maintain a comprehensive prosthodontic practice involving fixed, removable, and implant treatment procedures (including surgical placement of implants).

PROS 6032. Clinical Prosthodontics 2. 4.5 Credit Hours.

This spring course for advanced prosthodontic students is designed to provide extensive clinical experience in the broad spectrum of prosthodontics as a course in a progressively more complex clinical prosthodontic curriculum. Each student will have the opportunity to maintain a comprehensive prosthodontic practice involving fixed, removable, and implant treatment procedures (including surgical placement of implants).

PROS 6033. Clinical Prosthodontics 3. 8 Credit Hours.

This fall course for advanced prosthodontic students is designed to provide extensive clinical experience in the broad spectrum of prosthodontics in a progressively more complex clinical prosthodontics curriculum. Each student will have the opportunity to maintain a comprehensive prosthodontic practice involving fixed, removable, implant and maxillofacial prosthodontic patients.

PROS 6034. Clinical Prosthodontics 3. 6.5 Credit Hours.

This spring course for advanced prosthodontics students is designed to provide extensive clinical experience in the broad spectrum of prosthodontics in a progressively more complex clinical prosthodontics curriculum. Each student will have the opportunity to maintain a comprehensive prosthodontics practice of fixed, removable, implant, and maxillofacial prosthodontics patients.

PROS 6036. Maxillofacial Prosthodontics. 1 Credit Hour.

This clinical course provides the opportunity to experience treating patients on the Maxillofacial Prosthetics Service. Patients with congenital and acquired defects are treated under the supervision of the maxillofacial prosthodontics faculty.

PROS 6037. Clinical Prosthodontics. 1.5-4 Credit Hours.

This clinical course for Perio-Pros residents in their 3rd and 5th years is designed to provide complex clinical treatment experiences that integrate skills from both specialties. Each student will have the opportunity to maintain a comprehensive integrated Perio-Pros practice.

PROS 6043. Geriatric Dentistry. 0.5 Credit Hours.

The objective of this course is to provide the clinical and didactic background necessary to address the limitations geriatric patients pose for prosthodontic specialty level diagnosis, planning and treatment.

PROS 6046. OMS/Prosthodontics Seminar 2. 0.5 Credit Hours.

This fall semester course for second-year advanced prosthodontic students is the third in a continuum of seminar courses devoted to the discussion and coordination of treatments of patients under joint management of the Oral and Maxillofacial Surgery and Prosthodontics programs.

PROS 6047. OMS/Prosthodontics Seminar 2. 0.5 Credit Hours.

This spring semester course for second-year advanced prosthodontic students is the fourth in a continuum of seminar courses devoted to the discussion and coordination of treatments of patients under joint management of the Oral and Maxillofacial Surgery and Prosthodontics programs.

PROS 6048. Oral & Maxillofacial Surgery and Prosthodontics Seminar 3. 0.5 Credit Hours.

This fall semester course for third year advanced prosthodontics students is a continuation of seminar courses devoted to the discussion and coordination of treatments of patients under joint management of the Oral & Maxillofacial Surgery and Prosthodontics programs.

PROS 6049. Oral & Maxillofacial Surgery and Prosthodontics Seminar 3. 0.5 Credit Hours.

This spring semester course for third year advanced prosthodontics students is a continuation of seminar courses devoted to the discussion and coordination of treatments of patients under joint management of the Oral & Maxillofacial Surgery and Prosthodontics programs.

PROS 6069. Supervised Teaching 2. 2 Credit Hours.

This fall course is the first of two second-year advanced prosthodontics courses that provide students with the opportunity to teach fixed prosthodontic laboratory skills to predoctoral students under the supervision of experienced prosthodontic educators.

PROS 6070. Supervised Teaching 2. 2 Credit Hours.

This spring course is the second of two second-year advanced prosthodontics courses that provide students with the opportunity to teach fixed prosthodontic laboratory skills to predoctoral students under the supervision of experienced prosthodontic educators.

PROS 6071. Supervised Teaching 3. 2 Credit Hours.

This course is the first of two third-year advanced prosthodontics courses that provide students with the opportunity to teach prosthodontic clinical skills to predoctoral students under the supervision of experienced prosthodontic educators.

PROS 6072. Supervised Teaching 3. 2 Credit Hours.

This course is the second of two third-year advanced prosthodontics courses that provide students with the opportunity to teach prosthodontic skills to predoctoral students under the supervision of experienced prosthodontic educators.

PROS 6073. Literature Review Seminar 2. 1 Credit Hour.

This fall course for second-year advanced prosthodontics students is the third of six courses given in a three-year continuum of classical literature review seminars.

PROS 6074. Literature Review Seminar 2. 1 Credit Hour.

This spring course for second-year advanced prosthodontics students is the fourth of six courses given in a three-year continuum of classical literature review seminars.

PROS 6075. Literature Review Seminar 3. 1 Credit Hour.

This fall course for third year advanced prosthodontics students is the fifth of six courses given in a three-year continuum of classical literature review seminars.

PROS 6076. Literature Review Seminar 3. 1 Credit Hour.

This fall course for third year advanced prosthodontics students is the sixth of six courses given in a three-year continuum of classical literature review seminars.

PROS 6092. Research 2. 2 Credit Hours.

This summer course for advanced prosthodontics students is the first of three research courses in the second year. It is designed to offer an opportunity to review the literature and to design and complete a laboratory or clinical research project under the direction of a faculty advisor. Research should result in a paper suitable for publication in a peer-rated journal. Students in the master's programs will be expected to collect and analyze data for a thesis which must be defended as the culmination of research efforts.

PROS 6093. Research 2. 2 Credit Hours.

This summer course for advanced prosthodontics students is the first of three research courses in the 2nd year. It is designed to offer an opportunity to review the literature and to design and complete a laboratory or clinical research project under the direction of a faculty advisor. Research should result in a paper suitable for publication in a peer-rated journal. Students in the masters programs will be expected to collect and analyze data for a thesis which must be defended as the culmination of research efforts.

PROS 6096. Research 3. 2 Credit Hours.

This fall course for advanced prosthodontic students is the second of three research courses in the 3rd year. It is designed to offer an opportunity to review the literature and to design and complete a laboratory or clinical research project under the direction of a faculty advisor. Research should result in a paper by certificate students suitable for publication in a peer-rated journal. Students in the masters programs will be expected to collect and analyze data for a thesis which must be defended as the culmination of research efforts.

PROS 6097. Research 3. 2 Credit Hours.

This course for third-year students in advanced prosthodontics is offered in the fall only for M.S. Prosthodontic degree students and in both the fall and spring for certificate students who matriculated in 2011. It is designed to offer an opportunity to review the literature and design and complete a laboratory or clinical research project under the direction of a faculty advisor. Certificate program research should result in a paper suitable for publication in a peer-rated journal or a scholarly presentation at an approved specialty venue.

PROS 6098. Thesis. 1-9 Credit Hours.

Completion of an acceptable thesis is required for the Master of Science in Prosthodontics degree. Registration in this course for at least one semester is required of all degree candidates. Admission to candidacy for the Master of Science degree is required in order to enroll in this course.

PROS 6121. Advanced Prosthodontics 3. 1 Credit Hour.

This fall continuum course provides an open forum for a wide variety of faculty and guest consultants on topics of special interest to the specialty of prosthodontics.

PROS 6122. Advanced Prosthodontics 3. 1 Credit Hour.

This spring continuum course provides an open forum for a wide variety of faculty and guest consultants on topics of special interest to the specialty of prosthodontics.

PROS 7018. Fixed Prosthodontics. 1 Credit Hour.

This course is designed to be adjunct to and to complement the preclinical course so that the student correlates previous instruction in the clinical care of patients in need of crowns and/or fixed partial dentures.

PROS 7019. Fixed Prosthodontics Clinic. 4.5 Credit Hours.

This clinical course consists of diagnosis and treatment planning, instruction in making complete and partial veneer crown preparations and modifications, management of supportive tissues, provision of adequate pain control for restorative procedures, fabrication and insertion of provisional as well as cast restorations, and instruction to patients in the care and maintenance of restorations.

PROS 7091. Removable Partial Denture Prosthodontics Lecture. 0.5 Credit Hours.

This didactic course is designed to acquaint the student with a variety of approaches that may be used in treating the partially edentulous mouth. Lectures cover critical steps in treatment of the partially edentulous patient, stabilization of periodontically weakened teeth, intracoronal and other attachments used in partial denture construction, swinglock partial dentures, removable partial overdentures, and cancer therapy as it relates to prosthodontic treatment.

PROS 7092. Removable Partial Dentures Clinic. 1.5 Credit Hour.

A clinical experience designed to place continued emphasis on diagnosis, treatment planning, design principles, mouth preparation, and dental laboratory coordination. The student is given the opportunity to correlate biological and mechanical information in clinical care of patients requiring removable partial dentures. The student is required to complete treatment for one partial denture patient during the junior year.

PROS 7095. Complete Dentures Lecture. 0.5 Credit Hours.

This course offers a series of lectures designed to present more sophisticated concepts in the prosthodontic treatment of edentulous and partially edentulous patients not included in previous courses. Lecture topics include preparation of the tissues for dentures, complete denture esthetics, occlusal systems for complete dentures, single complete dentures, immediate dentures, overdentures, maintenance care for the complete denture patient, and relining of dentures.

PROS 7099. Complete Dentures Clinic. 2.5 Credit Hours.

This clinical course consists of diagnosis and treatment planning, management of supportive tissues, fabrication and placement of complete dentures, and instruction to patients in the care and maintenance of complete dentures. The clinical experiences encourage students to correlate biological and biomechanical information into the prosthodontic treatment of edentulous and partially edentulous patients.

PROS 8001. Dental Implantology. 0.5 Credit Hours.

This course is designed to be an ever-evolving lecture series designed to provide senior dental students with more information regarding advanced topics in implant dentistry. The premise of this course is to provide evidenced-based materials regarding the latest information and current topic of interest in the field of implant dentistry. Lecture topics may include but are not limited to advanced treatment planning, immediate provisionalization (Non-loaded) of dental implants, the controversy of connecting an implant to a natural tooth, implant esthetics, advanced prosthodontic techniques, and implant and the maxillofacial patient.

PROS 9021. Adv Prosthodontics 2. 5 Credit Hours.

This continuation course for second-year advanced prosthodontic students is designed to provide the postdoctoral student with the didactic basis for advanced clinical prosthodontic care.

PROS 9022. Advanced Prosthodontics 2. 5 Credit Hours.

This continuation course for second-year advanced prosthodontic students is designed to provide the postdoctoral student with the didactic basis for advanced clinical prosthodontic care.

PROS 9023. Advanced Prosthodontics 2. 5 Credit Hours.

This continuation course for second-year advanced prosthodontics students is designed to provide the postdoctoral student with the didactic basis for advanced clinical prosthodontic care.

PROS 9024. Adv Prosthodontics 3. 5 Credit Hours.

This course is designed to provide the postdoctoral student with the opportunity to gain the prerequisite background and clinical experience in prosthodontic procedures. Fixed, removable, and overdenture concepts and treatment procedures will be emphasized.

PROS 9029. Clinical Prosthodontics 2. 4.5 Credit Hours.

This fall course for second-year advanced prosthodontic students is designed to provide extensive clinical experience in the broad spectrum of prosthodontics as a fifth clinical course in a progressively complex clinical prosthodontic curriculum. Each student will have opportunity to maintain a comprehensive prosthodontic practice involving fixed, removable, and implant treatment procedures.

PROS 9030. Clinical Prosthodontics 2. 2 Credit Hours.

This summer course for second-year advanced prosthodontics students is designed to provide extensive clinical experience in the broad spectrum of prosthodontics as a fourth clinical course in a progressively complex clinical prosthodontic curriculum. Each student will have the opportunity to maintain a comprehensive prosthodontic practice involving fixed, removable, and implant treatment procedures.

PROS 9031. Clinical Prosthodontics 1. 6 Credit Hours.

This course provides instruction in the laboratory procedures and clinical aspects of complete dentures, removable partial dentures, fixed, and implant prosthodontics. Residents are required to understand laboratory techniques and dental materials and to perform all phases of laboratory support related to clinical prosthodontics.

PROS 9032. Clinical Pros 1. 2 Credit Hours.

This spring course for advanced prosthodontic students is designed to provide extensive clinical experience in the broad spectrum of prosthodontics as a sixth clinical course in a progressively complex clinical prosthodontic curriculum. Each student will have the opportunity to maintain a comprehensive prosthodontic practice involving fixed, removable, and implant treatment procedures.

PROS 9040. Hosp Maxillofacial Rotation. 1.5 Credit Hour.

Rotation in the Maxillofacial Prosthetics Department gives residents clinical exposure to geriatric and maxillofacial patients. 3rd year residents provide treatment for a patient requiring an obturator prosthesis. Residents with special interest in maxillofacial prosthetics may have the opportunity to treat additional maxillofacial patients that require other various prostheses.

PROS 9073. Literature Seminar 1. 3 Credit Hours.

This course for second-year advanced prosthodontics students is one of a series of courses given in a three-year continuum of classical literature review seminars.

PROS 9074. Literature Seminar 2. 3 Credit Hours.

This course for second-year advanced prosthodontics students is one of a series of courses given in a three-year continuum of classical literature review seminars.

PROS 9075. Literature Seminar 2. 3 Credit Hours.

This course for second-year advanced prosthodontics students is one of a series of courses given in a three-year continuum of classical literature review seminars.

PROS 9076. Literature Seminar 3. 3 Credit Hours.

The broad field of prosthodontics literature is systematically reviewed with the objective of providing the postdoctoral student with a background of prosthodontics knowledge and history.

PROS 9077. Literature Seminar 3. 3 Credit Hours.

The broad field of prosthodontics literature is systematically reviewed with the objective of providing the postdoctoral student with a background of prosthodontics knowledge and history.

PROS 9097. Research. 1-9 Credit Hours.

The student develops a research protocol and background literature search for a clinical, laboratory, or animal model research project.