

# MASTER OF SCIENCE IN DENTAL HYGIENE

The Master of Science in Dental Hygiene (MSDH) degree program offers graduate students in-depth learning experiences in research principles and application, teaching principles and application, and the health care sciences. The mission of the program is to educate professionals for positions of leadership in their profession. The goal of this program is to prepare dental hygienists to expand their knowledge base and skill set of the profession by nurturing the intellectual development of the professional. The Master of Science in Dental Hygiene degree prepares professional dental hygienists with specialized skills in one or more of the following areas: health promotion/education, management/administration, research, and consumer advocacy.

## Admissions Requirements

This is a 100% online graduate program that typically enrolls six qualified students each fall. In addition to the academic admission requirements, non-academic factors may be considered when selecting students for admission to this competitive graduate program. International applicants currently residing in the United States or Canada may be considered if all other admission requirements are met.

1. Bachelor's degree from a nationally and regionally accredited institution of higher education in the United States.
2. Graduation from an accredited dental hygiene program recognized by the American Dental Association Commission on Dental Accreditation (CODA) within the United States or Canada.
3. Successful completion of the Dental Hygiene National Board Examination.
4. Current licensure as a Registered Dental Hygienist in any state in the United States or Canada.
5. Satisfactory grades in undergraduate courses. The undergraduate grade point average should be no lower than a 3.0 on a 4.0 point scale system.
6. Complete the Graduate Record Examinations General Aptitude Test (GRE) or the Miller Analogies Test (MAT). Scores on GRE and MAT tests must be within the previous 5 years. No minimum score is required.
7. Applicants from countries where English is not the native language, are required to submit scores on the Test of English as a Foreign Language (TOEFL). A minimum score of 84 on the Internet based test is required.
8. Applicants outside of Texas MUST reside in a participating National Council for State Authorization Reciprocity Agreements NC-SARA state to be accepted into our program. To see if your state participates and get more information, please visit NC-SARA website (<http://nc-sara.org/>).

## Application Requirements

Applicants must meet all qualifications and submit all required information by April 15. Transcripts containing fall courses must also be submitted by April. Contact the Program Director, Melanie V. Taverna MSDH, RDH, with questions at 210-567-3858 or [Taverna@uthscsa.edu](mailto:Taverna@uthscsa.edu).

## Degree Requirements

A Master of Science in Dental Hygiene is awarded following successful completion of the core curriculum and electives to earn a total of 36

semester credit hours. The master degree requires the student develop original research to be conducted and shared with the oral health professions.

### Sample Plan of Study

#### Core Courses

DENH 5026	Research Principles & Application	3
DENH 5924	Biostatistics	3
DENH 5024	Professional Communication	3
DENH 5050	Educational Principles and Application	3
INTD 5023	Research Ethics	1
DENH 5022	Research Apprenticeship	3
DENH 6098	Thesis	6

All Master students are required to successfully complete all core coursework.

#### Course Electives <sup>1</sup>

Select three or four of the following: 14

#### Education Offerings

DENH 5003	Current Issues In Dental Hygiene
DENH 5007	Clinical Administration Practicum
DENH 5010	Teaching Internship
DENH 5017	Clinical Teaching Practicum
DENH 5080	Survey Methodology
DENH 5091	Special Topics in Dental Hygiene
DENH 5903	Organizational Leadership
DENH 5926	Preclinical Teaching Practicum
DENH 6091	Independent Study

#### Public Health Offerings

DENH 5015	Public Health Practicum
DENH 5027	The Summer Institute In Aging
DENH 5025	Dental Hygienist Role in the Management of Elder Abuse
DENH 5028	Public Health Policy
DENH 5036	Health Promotion
DENH 5080	Survey Methodology
DENH 5091	Special Topics in Dental Hygiene
DENH 6091	Independent Study

**Total Credit Hours 36**

<sup>1</sup> Master students should choose a minimum of 14 credit hours from the course electives. This may be accomplished by choosing courses from the Education Offerings, the Public Health Offerings, or a combination of the two.

## Objectives/Program Outcomes

Objectives of this program are to promote a student-centered, on-line learning environment that will allow dental hygienists the opportunity to further their education without relocating to San Antonio. The curriculum will allow students to gain knowledge and skills to become competent health care educators, managers of community oral health care centers, and conduct original research. Self-evaluation and self-direction are encouraged throughout the program. Students have the opportunity to share their experiences, knowledge and skills, work cooperatively with

colleagues, and explore a variety of resources to help them reach their maximum potential.

Outcomes:

1. Demonstrate proficiency in core dental hygiene principles—Students in the Graduate Program in Dental Hygiene will be able to define, explain and apply key concepts and fundamental principles related to dental hygiene.
2. Critically review and interpret research literature—Students in the Graduate Dental Hygiene Program will be able to conduct a comprehensive systematic literature search, critically analyze and synthesize evidence gathered, and apply the research process to an identified problem.
3. Completion of required Core coursework (DENH 5026, DENH 5924, DENH 5024, DENH 5050, INTD 5023), & (DENH 5022). Plus submission of a publishable manuscript of original research to a juried journal as a thesis project (DENH 6098).
4. Communicate effectively in writing—Students in the Graduate Dental Hygiene Program will be able to demonstrate effective communication through writing using correct grammar, syntax, and purpose of thought.
5. Conduct independent research in an ethical manner—Students in the Graduate Dental Hygiene Program will be able to demonstrate ethical principles in the course of conducting research and writing a thesis.

## Courses

### **DENH 3004. Oral Anatomy. 2 Credit Hours.**

The oral anatomy course is designed to provide the dental hygiene student with instruction in dental terminology and the anatomy of the teeth. Emphasis is placed on clinical considerations of oral anatomy relevant to dental hygiene practice. Includes one (1) lecture hour and three (3) laboratory hours per week. Course fees: Materials fee \$50  
Prerequisites: Must meet the basic requirements for admission to the Dental Hygiene program.

### **DENH 3006. Preclinical Dental Hygiene. 2 Credit Hours.**

This course is an introduction to instrumentation techniques and basic clinical procedures. The course offers an opportunity to develop competency in fundamental clinical skills necessary to engage in patient treatment. Includes eight (8) clinical hours per week. Students must meet the basic requirements for admission to the Dental Hygiene program. Course fees: Lab fee \$10 Corequisites: DENH 3023.

### **DENH 3007. Preclinical Teaching Practicum. 4 Credit Hours.**

This course will provide students with an introduction to concepts of preclinical instruction. Instruction will include seminar and laboratory application sessions emphasizing theories of psychomotor skill development; diagnosis of performance problems; provision of feedback; identification of cognitive, psychomotor, and affective behaviors; and faculty calibration. This course requires formal agreement with a participating dental hygiene program prior to the beginning of class. (The didactic portion of this course is delivered through Canvas, Learning Management System) Course Fees: Practicum fee \$10 per hour.

### **DENH 3015. Public Health Practicum. 4 Credit Hours.**

This course is an opportunity to gain experience with oral health care delivery or promotion in a public health area. The course will include planning and execution of a project in the student's individual area of interest. One full day per week requires the Bachelor of Science Completion student to work in a public health setting in San Antonio or in their community. A formal agreement must be established with the participating public health clinic prior to the beginning of class. Course Fees: Lab fee \$10 per hour.

### **DENH 3017. Clinical Teaching Practicum. 4 Credit Hours.**

This course is an introduction to clinical instruction for the Bachelor of Science Degree Completion Student. Students will have the opportunity to gain experience in identifying and correcting performance problems relating to direct patient care. Instruction will include seminar and a clinical application session emphasizing the instructor's role as a facilitator, role model and evaluator. (Pre clinic teaching practicum is required as a pre-requisite for this course, exceptions will be considered for DH educators. It is possible for students not living in San Antonio to complete this course with another Dental Hygiene program) (Requires formal agreement with the participating DH program prior to classes beginning). Course Fees: Practicum fee \$10 per hour.

### **DENH 3018. Dental Radiography. 3 Credit Hours.**

This course is an introduction to scientific principles of oral radiography including essential terminology, the production and absorption of radiation, X-ray unit function, imaging systems, processing, quality assurance, radiation biology, and protection. This course is designed to emphasize radiation health and protection principles and techniques of intraoral and extraoral radiography, exposing, processing, mounting, and critical evaluation of dental radiographs. Laboratory experience and clinical applications are emphasized. Includes two (2) lecture hours and three (3) clinical hours per week. Students must meet the basic requirements for admission to the Dental Hygiene program. Course fees: Materials fee \$50.

### **DENH 3019. Preventive Dental Hygiene Theory. 3 Credit Hours.**

This course is an introduction to concepts used in oral health instruction and patient education. Included in the course is the etiology of dental disease, plaque control, oral physiotherapy, methodology of oral health instruction, nutritional counseling, and patient motivational techniques. This course is designed to give the student an opportunity to develop skills which are necessary for teaching patients how to achieve optimal oral health and to offer experience in communication skills for interpersonal, professional and patient education interaction. The course will also provide an overview of current counseling recommendations to prevent dental and periodontal disease. Includes two (2) lecture hours and three (3) hours of lab per week. Students must meet the basic requirements for admission to the Dental Hygiene program.

### **DENH 3020. Clinic 1 Seminar. 2 Credit Hours.**

This course presents current theoretical perspectives in which to interpret and expand dental hygiene care. Topics included within the course are cultural diversity, instrument sharpening, communication skills, ultrasonic scalers, and air abrasive polishers. Other topics related to beginning clinical practice are also incorporated. Includes two (2) lecture hours per week. Corequisites: DENH 3021, DENH 3020  
Prerequisites: DENH 3023.

**DENH 3021. Clinic 1 Practicum. 3 Credit Hours.**

This course is a clinical experience in the practical application of patient education and oral prophylaxis techniques. Emphasis will be placed on comprehensive care for the simple patient classifications, including patient assessment, dental hygiene treatment planning, patient education, instrumentation, preventive therapies, and radiographic skills. Includes twelve (12) clinic hours per week. Course fees: Practicum fee \$10 per hour Lab fee \$30. Corequisites: DENH 3020 Prerequisites: DENH 3006, DENH 3018, DENH 3020.

**DENH 3022. Dental Materials. 3 Credit Hours.**

This course is a study of the materials and adjunct materials used in restorative dentistry and in various other specialty areas of dentistry to fabricate dental appliances and tooth restorations. This course includes lecture and laboratory components designed to help students develop an understanding of the composition, properties, structure, and manipulative variables of dental materials historically used in dentistry as well as the most current materials available. Emphasis is placed on practical, clinical applications of materials; the dental hygienist's role in educating patients regarding these materials; and the techniques for placement of the materials in the oral cavity. Also included is a discussion of the various categories of dental specialties and the materials used by each specialty. Includes two (2) lecture hours and three (3) lab hours per week. Course fees: Materials fee \$50 Prerequisites: Must meet the basic requirements for admission to the Dental Hygiene program.

**DENH 3023. Intro To Clinical Theory. 3 Credit Hours.**

This course is an introduction to the theory associated with clinical procedures and patient care. Topics include prevention of disease transmission in the dental setting and patient assessment skills such as vital signs, health history, and oral inspection. An introduction to ethics related to the dental setting is incorporated. Includes three (3) lecture hours per week. Corequisites: DENH 3006, DENH 3023 Prerequisites: Must meet the basic requirements for admission to the Dental Hygiene program.

**DENH 3033. Structures Of The Head And Neck. 2 Credit Hours.**

The purpose of this course is to give dental hygiene students an appreciation of the anatomical structure of the head and neck region of the human body, which will serve as a foundation of anatomical knowledge that is essential for patient care and useful in understanding function, local pain, anesthesia, and oral pathology. Includes one (1) lecture hour and three (3) lab hours per week. Prerequisites: Must meet the basic requirements for admission to the Dental Hygiene program.

**DENH 3034. Periodontics. 3 Credit Hours.**

This course presents an in-depth study of the basics of periodontics. This course will include, but is not limited to, the following: the tissues of the periodontium, clinical assessment of the periodontium, classifications of periodontal diseases, identification of etiologic factors, the relationship of the immune response to the inflammatory process and pathogenesis of periodontal diseases, clinical indices used in periodontics, and systemic factors involved in periodontal diseases. Emphasis is placed on the clinical application of current theory. Includes three (3) lecture hours. Students must meet the basic requirements for admission to the Dental Hygiene program. Corequisites: DENH 3021.

**DENH 3035. Pharmacotherapeutics. 4 Credit Hours.**

This course integrates elements of dental hygiene care as they relate to the treatment planning for special patients, understanding pharmacological agents used in dentistry, and management of medical emergencies in the dental office to include: concepts and practice related to the prevention, recognition, and management of medical emergencies that occur in the dental office with specific emphasis on systemic disease processes; understanding drug groups, their mechanism of action, dosage, indication of use, adverse effects, drug interactions, oral side effects in the treatment of human disease process, and its application in the dental hygiene clinical setting. Includes three (3) lecture hours and three (3) laboratory hours per week. Course Fees: Materials fee \$ 50 Prerequisites: Must meet the basic requirements for admission to the Dental Hygiene program.

**DENH 3040. Histology/Embryology. 2 Credit Hours.**

This course continues the study of the oral cavity from a histological perspective. It includes the development and microscopic organization of the four basic body tissues in the formation of the oral cavity (i.e., development of the face, oral cavity, and teeth). This information is basic to the understanding of the histological changes arising from pathological alterations in the oral cavity. Includes two (2) lecture hours per week. Prerequisites: DENH 3033.

**DENH 4007. Clinical Administration Practicum. 4 Credit Hours.**

The purpose of this course is to present Bachelor of Science Degree Completion students with an opportunity to hone administrative skills in a clinical environment. There will be interactions with second-year dental hygiene students as well as with the second-year clinic coordinator. The course includes conference and clinical application sessions to expand and refine teaching and evaluation skills and clinic administration issues including outcomes assessment, quality assurance, and information technology. This course requires a formal agreement with a participating dental hygiene program at least six weeks to the beginning of class. To begin the process, contact the UTHSCSA program director. Completion of DENH 3007 Pre-Clinic Teaching Practicum is required or previous clinical teaching experience. The course instructor may waive the prerequisites course requirement based on previous clinical teaching experience. Course Fees: Practicum fee \$10.00 per hour. Open for Cross Enrollment on Space Available Basis.

**DENH 4012. Oral Pathology. 3 Credit Hours.**

This course introduces the principles of human disease including pathogenesis, clinical appearance, and treatment. In certain instances, microscopic features will be discussed if they enhance the understanding of the disease process. A portion of the course is devoted to basic principles of general pathology. The majority of the course is an overview of oral pathology with an emphasis on the dental hygienist's role in the recognition of oral disease. Includes three (3) lecture hours per week. Prerequisites: DENH 3033, DENH 3040.

**DENH 4015. Clinic 3 Practicum. 3 Credit Hours.**

A continuation of DENH 4022 Clinic 2, this course provides students the opportunity to incorporate all learning in providing comprehensive dental hygiene care for patients with simple to complex needs with emphasis on more complex cases, gain experience in the practical application of dental hygiene diagnosis, utilize preventive techniques in patient education skills, practice oral prophylaxis techniques including advanced scaling, implement various management techniques for the difficult patient, and improve efficiency and effectiveness in patient care. Includes twelve (12) clinic hours per week. Course fees: Practicum fee \$10 Lab fee \$30 Prerequisites: DENH 4022 Corequisites: DENH 4016.

**DENH 4016. Clinic 3 Seminar. 2 Credit Hours.**

This course will provide the dental hygiene student with current theoretical perspectives in which to interpret and expand dental hygiene care. Advanced and adjunctive procedures for clients of special populations are presented in seminar format and build upon the basic concepts and skills learned during Preclinic, Clinic I, and Clinic II. Knowledge gained will be applied in clinical practice through new skill acquisition and expanded client care options. Professional ethical codes and major contemporary health issues facing the dental hygienist will be presented as well as legal aspects of health care and state Dental Practice Act requirements. Includes two (2) lecture hours per week. Prerequisites: DENH 4020. Clinic 2 Seminar Corequisites: DENH 4015.

**DENH 4017. Community Oral Health Practicum 2. 2 Credit Hours.**

This course is the continuation of the fall Community Oral Health Course Practicum 1 in which students apply public health/health education principles through implementing individual community oral health education projects, and through participating in service-learning activities outside the Dental School setting. Opportunities include rotations in public schools and in public health dental clinics. Emphasis is placed on students interacting with a variety of patients, including the physically and mentally challenged, indigent populations, and geriatric groups. Students gain experience in health education, as well as additional experience in providing clinical preventive services out in the community. Includes eight (8) clinic hours per week in off-campus rotations or community projects. Course fees: Practicum fee \$10 per hour Prerequisites: DENH 4021.

**DENH 4018. Introduction to Research. 3 Credit Hours.**

This course is designed to provide the student with an opportunity to expand research knowledge in two dimensions; principles and applications. The course will consist of an in depth study of the research process, its contexts, design, data collection and communication techniques to provide learners with the analytical skills to interpret professional and scientific literature. Topics include: basic research terminology, critical evaluation of research design, methodology and sampling techniques, basic statistical calculations, data collection, and the application of evidenced based research to dental hygiene best practice. The course will also develop reading and writing skills within the context of face-to-face and/or virtual environments. Prerequisites: DENH 3020, DENH 3021, DENH 3034, DENH 3035, DENH 3040.

**DENH 4019. Practice Management. 2 Credit Hours.**

This course presents the fundamentals of dental practice for the transition from dental hygiene student to practitioner, including how to apply and maintain state licensure, state board regulations and procedures necessary to be in compliance as a clinician, how to manage production, interpersonal relationships among members of the dental health team, resumé writing and interviewing skills, retirement and future planning, and setting personal and professional goals. Emphasis will be on current issues in dental hygiene practice and on practical approaches to preparing students to enter the private practice setting as a member of the oral health team. Includes two (2) lecture hours per week. Prerequisites: DENH 3021, DENH 4021, DENH 4022, DENH 4026.

**DENH 4020. Clinic 2 Seminar. 2 Credit Hours.**

This course is designed to provide the dental hygiene student with current theoretical perspectives in which to interpret and expand dental hygiene care. Advanced and specialized adjunctive procedures are presented in seminar format and build upon the basic concepts and skills learned during Preclinic and Clinic 1. Knowledge gained will be applied in clinical practice through new skill acquisition and expanded client care options. Case studies will be presented related to ethical issues encountered in clinical settings. Includes two (2) lecture hours per week. Corequisites: DENH 4022 Prerequisites: DENH 3020, DENH 3035, DENH 3034.

**DENH 4021. Community Oral Health Practicum 1. 4 Credit Hours.**

Community Oral Health Practicum 1, offered in the fall semester, is the prerequisite course to Community Oral Health Practicum II offered in the spring semester. The purpose of this course is to instill in students the important role of the dental hygienist in the community, and to provide an understanding of the relationship of community oral health to public health. Students will have an opportunity to learn how to promote oral health and prevent oral disease in the community. Students will have an opportunity to learn concepts such as assessment, planning, implementation, and evaluation phases of community-based programs. During this course, the students will plan a community oral health education program that is implemented and evaluated during Community Oral Health Practicum II. Cultural differences, socioeconomic factors and barriers to health care are discussed in relation to developing preventive programs. In addition, students will have an opportunity to learn about federal and state public health programs and current public health issues. Community oral health programs for vulnerable populations such as indigent, geriatric, and special-needs patients are included. Also, students will have an opportunity to participate in community service learning activities that will allow them to provide clinical and educational services to underserved populations. The course includes three lecture hours and four clinical hours per week. Course fees: Practicum fee \$10 per hour Prerequisites: DENH 3021.

**DENH 4022. Clinic 2 Practicum. 3 Credit Hours.**

A continuation of DENH 3021 Clinic 1, this course provides further opportunity to incorporate all learning in providing comprehensive dental hygiene care for patients with simple to complex needs with an emphasis on moderate cases. In addition, this course provides an opportunity for the student to gain experience in the practical application of dental hygiene diagnosis, utilize preventive techniques in patient education skills, practice oral prophylaxis techniques including advanced scaling, and implement various management techniques for the difficult patient. Includes twelve (12) clinic hours per week. Course Fees: Practicum fee \$10 per hour Lab fee: \$30. Prerequisites: DENH 3021, DENH 3022, DENH 3034, DENH 3035 Corequisites: DENH 4020.

**DENH 4023. Special Topics. 1-3 Credit Hours.**

Students will be given an opportunity to gain an in-depth understanding of selected topics through seminars, conferences, projects, or other appropriate learning methods.

**DENH 4024. Concepts And Practice In Teaching. 3 Credit Hours.**

This course offered to Bachelor of Science Degree Completion students, introduces basic principles and techniques used in health care education. Topics include: issues and trends in professional education, principles of adult education, learning styles and motivation, case-based learning, competency-based education, patient and community education, clinical and laboratory instruction, course design, development of lesson plans and learning activities, guidelines for presentation skills, evaluating student performance, and using educational media and software. Open for Cross Enrollment on Space Available Basis.



**DENH 4025. Advanced Periodontics. 3 Credit Hours.**

This course builds on the knowledge base presented in DENH 3034 Periodontics, and gives students the opportunity to expand their understanding of treatment, prevention, and diagnosis of periodontal disease. This course examines, but is not limited to, the following topics: the role of the hygienist in non-surgical soft-tissue management, exposure to surgical techniques, wound healing, new technology in diagnostic tools, and products used in treatment or home care. This course further emphasizes the integration of theory into the practice of clinical dental hygiene. Includes three (3) lecture hours per week. Prerequisites: DENH 3034 and completion of first year dental hygiene coursework.

**DENH 4026. Healthcare Ethics. 1 Credit Hour.**

This course is designed to provide students with an overview of professional and ethical issues facing dental hygiene professionals. Topics to be explored include the beliefs, fundamental principles, core values and standards of professional responsibility set forth in the ADHA Code of Ethics for Dental Hygienists. Ethical dilemmas will be discussed and decision making models will be introduced and used to assist students in solving these dilemmas. Additionally, team-based learning activities will serve to support student learning. Prerequisites: DENH 3020, DENH 3021, DENH 3034, DENH 3035, DENH 3040.

**DENH 4027. The Summer Institute In Aging. 3 Credit Hours.**

This course is an intensive interdisciplinary service-learning study of the assessment, health promotion, disease prevention, and treatment of the aging person. The course will examine physical, mental, emotional, legal, cultural, and social aspects of gerontology. The course is also designed to encourage the learner to reflect on the impact of the elderly on society, the impact to the dental hygiene profession, and the learner on a personal level.

**DENH 4028. Public Health Policy. 3 Credit Hours.**

This course will provide the learner with a history and overview of American public health policy. Included in the course is the evolution of health policy in the United States. Various resources will be explored to gain understanding of the process for policy development. By the end of the term the learner will develop a mock public policy analysis, about a topic of their choice that will include elements discussed in the course. When appropriate this course will utilize new and emerging public health policies to supplement course material. Admission to the Bachelor of Science Degree Completion Program is required.

**DENH 4029. Dental Hygienist Role in the Management of Elder Abuse. 3 Credit Hours.**

This course will allow the learner to acquire the skills and knowledge to recognize the mistreatment of elders. First, the various types of elder abuse will be identified followed by discussion of the prevalence of abuse. Next, case study application will direct the learner in recognizing the risk factors and signs of elder abuse. The legal requirement and major ethical dimensions for the dental hygienist to report abuse will be explored, and an explanation of required abuse documentation will be provided. Finally, techniques for the dental hygienist may work effectively with law enforcement will conclude this course.

**DENH 4030. Introduction to Professional Writing. 1 Credit Hour.**

This course was designed to help the online bachelor completion student develop concepts of professional writing skills utilizing state of the art communication resources. This is a required course for BS completion students to be taken in their first semester of the program.

**DENH 4040. Dental Hygiene Honors Program. 0 Credit Hours.**

This course is to introduce dental hygiene students to fundamental principles of teaching and learning with focus on planning courses, analyzing the learning environment, planning and presenting brief, focused mini-lectures, known as Rapid Teach Topics, and completing a Triple T (Tough Teaching Topic) exercise in small groups. Students also analyze their personality in relation to academics as a career.

**DENH 4045. Academic Dental Hygiene Career Mentorship. 0 Credit Hours.**

This course provides dental hygiene students with an opportunity to explore first-hand the academic arm of the dental hygiene profession by learning about faculty members' pathways into academic teaching and eliciting faculty perspectives about working in dental hygiene schools.

**DENH 4050. Dental Hygiene Classroom Teaching Seminar. 0 Credit Hours.**

The course goal is to provide senior dental hygiene students with opportunities to function as a teacher by planning and delivering instruction followed by: self assessment, feedback from the students who received the instruction, and feedback from the THP Director and/or faculty members who observed the students' teaching activities. The focus of this course is classroom teaching.

**DENH 4091. Independent Study. 1-3 Credit Hours.**

This course includes independent reading, research, discussion, project, and/or writing under the direction of a faculty member. The course may be repeated for credit. UTHSCSA graduates are limited to one Independent Study course; non-UTHSCSA grads are limited to two Independent study courses.

**DENH 4103. Health Promotion. 3 Credit Hours.**

This course provides the Bachelor of Science Degree Completion student a theoretical framework for defining health promotions and set the foundation for students to see potential for health promotions in their work. Topics in this course will use evidence-based practice to reflect health promotion theories, prevention, risk assessment, health education, and health policy. Additionally, interventions and strategies will be used to effectively evaluate the determinants of health and the outcomes of individuals, families, groups and communities. In addition this course will help learners understand the impact of media and delivery style for effective health messages.

**DENH 4111. Current Issues In Dental Hygiene. 3 Credit Hours.**

This course investigates trends influencing the practice of dental hygiene. The history and image of dental hygiene, career satisfaction, educational trends and access to care, independent practice and self-regulations are the issues addressed in this course. A closer look at the legal, political and ethical ramifications of these topic areas as they relate to the dental hygiene profession will be explored. Prerequisites: DENH 3021, DENH 4021, DENH 4022, DENH 4026.

**DENH 4415. Advanced Public Health Practicum. 4 Credit Hours.**

This course is a continuation of the Public Health Practicum and will provide the Bachelor of Science Degree Completion students with an opportunity to gain further experience with oral health care delivery projects, development of health promotion and prevention activities, or gain advanced skills in designing community-based and service learning programs. This course will include planning and execution of a project related to the student's individual area of interest. Course fees: Practicum fee \$10 per hour.

**DENH 4926. Peer Teaching Rotation. 0 Credit Hours.**

This selective is limited to THP students pursuing the Distinction in Dental Education. The course goal is to provide senior dental hygiene students with opportunities to function as a clinical instructor (Faculty for the day) in the 1st Year Clinic I (DENH 3021) for junior dental hygiene students.

**DENH 4927. Research in Dental Hygiene Education (RIDHE). 0 Credit Hours.**

This selective is designed for students pursuing the Distinction in Dental Education who desire to acquire skills and experience in educational research beyond the core expectations of the THP. The course goals are to enhance the capacity of participants to: (1) design a research poster or study that explores educational issues and (2) present the research at a professional organization meeting such as SCADHA. THE RIDE course has 3 components: designing educational research, grant writing, and writing for publication. Students work in teams to plan and implement an educational research project during the course. During seminars on grant writing, participant teams develop and present a grant application to fund an educational development project and receive a critique. During seminars on writing for publication, participants complete writing exercises, critique a manuscript and write an abstract, which is presented to the class for peer feedback.

**DENH 4928. Dental Spanish. 0 Credit Hours.**

This 10 week/10 hour course is offered to dental students as a selective. It is designed for students who are interested in acquiring basic conversational skills in the Spanish language, with focus on Spanish terminology, phrases, and brief sentences used during dental patient care to describe treatment, understand and answer patient questions, explain dental equipment and understand patient's responses to medical and dental history questions. This course is not a Spanish language class and will focus mainly on teaching dental students how to interact with their Spanish-speaking patients in the clinic. Basic words, phrases and sentences used in everyday conversations in Spanish are also reviewed. This selective is conducted by Spanish-fluent dental students for their student peers who desire to enhance their ability to communicate with Spanish-speaking patients. Students in DENH 4928 complete pre and post-tests to measure their progress in recognizing basic Spanish terminology, phrases and brief/simple sentences that will be useful to know in the dental clinic. There is no required pass-level on the post-test; the test is for self-assessment purposes.

**DENH 4929. Leadership in Interprofessional Service Learning. 0 Credit Hours.**

This is an innovative interprofessional community service learning (CSL) course for medical, dental, nursing, and school of health profession students. The goal of this course is to promote social accountability among health professional students through the integration of meaningful service learning with the core competencies of interprofessional education. This course enables students from various health science professions to learn with, from, and about each other and each other's roles on a health care team as they examine social determinants of health and social justice issues while applying these principles in a structured service learning practicum.

**DENH 5003. Current Issues In Dental Hygiene. 3 Credit Hours.**

This course investigates trends influencing the practice of dental hygiene. The history and image of dental hygiene, career satisfaction, educational trends, and access to care, independent practice, and self-regulations are the issues addressed in this course. A closer look at the legal, political and ethical ramifications of these topic areas as they relate to the dental hygiene profession will be explored. Acceptance into the Master of Dental Hygiene Program is required to take this course.

**DENH 5007. Clinical Administration Practicum. 4 Credit Hours.**

The purpose of this course is to present the graduate student with an opportunity to hone administrative skills in a clinical environment. There will be interactions with second-year dental hygiene students as well as with the second-year clinic coordinator. The course includes web based interaction focusing on clinical application to expand and refine teaching and evaluation skills necessary for clinic administration. Specific topics include outcomes assessment, quality assurance, and information technology. Permission from the program director is required. The prerequisite requirement can be waived by the program director. Prerequisite: DENH 5050. Course Fees: Practicum fee \$10 per hour.

**DENH 5010. Teaching Internship. 3 Credit Hours.**

This internship will provide graduate students with the opportunity to teach in various clinics, laboratories, and didactic courses to acquire experience in instructing undergraduate students in a variety of situations. The course is arranged on a contractual basis and tailored to meet the individual goals, needs, and interests of each graduate student, while keeping in mind background experiences. Supervision and evaluation of teaching performance are provided by the graduate faculty. Student must have prerequisite or approval by Program Director. Prerequisite: DENH 5050. Course Fees: Practicum fee \$10 per hour.

**DENH 5015. Public Health Practicum. 4 Credit Hours.**

This course is an opportunity to gain experience with oral health care delivery or promotion in a public health area. The course will include planning and execution of a project in the student's individual area of interest. One full day per week requires the Master of Science student to work in a public health setting in San Antonio or in their community. A formal agreement must be established with the participating public health clinic prior to the beginning of class. Course Fees: Practicum fee \$10 per hour.

**DENH 5017. Clinical Teaching Practicum. 4 Credit Hours.**

This course is an introduction to clinical instruction. The student will have the opportunity to gain experience in identifying and correcting performance problems relating to direct patient care. Instruction will include seminar and a clinical application session emphasizing the instructor's role as facilitator, role model, and evaluator. This course requires formal agreement with a participating dental hygiene program prior to the beginning of class. (The didactic portion of this course is delivered through CANVAS.) Students must have taken DENH 5050 before registering for this course or get a waiver by the Program Director. Course Fees: Practicum fee \$10 per hour.

**DENH 5022. Research Apprenticeship. 3 Credit Hours.**

This course allows a graduate to review the literature and to design a research project under the direction of a faculty advisor that leads toward thesis research. Students are expected to design a research proposal that prepares them to collect and analyze data for their future thesis project. Prior to registering for this course requires approval from the advanced program director. This course must be completed in its entirety prior to enrolling in Thesis (DENH 6098). Successful completion of core studies for the Master of Science in Dental Hygiene program to include Educational Principles and Applications, Research Principles and Applications, Biostatistics, Research Ethics, and Professional Communication.

**DENH 5024. Professional Communication. 3 Credit Hours.**

This course is designed to help the student develop concepts of professional communication including verbal, visual, and writing skills using state-of-the-art communication resources. Within an interactive topic and computer laboratory format, the students is expected to produce a series of scientific writings, abstracts, annotated bibliographies, and a term paper/research report in the form of a review of the literature. Open for Cross Enrollment on Space Available Basis.

**DENH 5025. Dental Hygienist Role in the Management of Elder Abuse. 3 Credit Hours.**

This course will allow the learner to acquire the skills and knowledge to recognize the mistreatment of elders. First, the various types of elder abuse will be identified followed by a discussion of the prevalence of abuse. Next, case study application will direct the learner in recognizing the risk factors and signs of elder abuse. The legal requirement and major ethical dimensions for the dental hygienist to report abuse will be explored, and an explanation of required abuse documentation will be provided. Finally, techniques for the dental hygienist may work effectively with law enforcement will conclude this course.

**DENH 5026. Research Principles & Application. 3 Credit Hours.**

This course is designed to provide the student with an opportunity to expand research knowledge. The course will consist of an in depth study of the research process, its contexts, design, data collection and communication techniques. All students are expected to complete assigned readings and participate in on-line discussions and activities that will complement principles covered in assignments. Students must be accepted into the Master of Science in Dental Hygiene program to take this course.

**DENH 5027. The Summer Institute In Aging. 3 Credit Hours.**

This course is an intensive interdisciplinary service-learning study of the assessment, health promotion, disease prevention, and treatment of the aging person. The course will examine physical, mental, emotional, legal, cultural, and social aspects of gerontology. The course is also designed to encourage the learner to reflect on the impact of the elderly on society, the impact to the dental hygiene profession, and the learner on a personal level. Acceptance into the Master of Science in Dental Hygiene Program is required to take this course.

**DENH 5028. Public Health Policy. 3 Credit Hours.**

This course will provide the learner with and overview of American Public health policy, and the changes in policy as a result of international and national initiatives. Included in the course is the evolution of oral health public policy in the United States. Many resources will be explored to gain understanding of the process of policy development. The student will locate current event articles that discuss topics in the reading. Capstone projects vary from researching and submitting a public policy paper or white paper on a topic pertinent to the coursework. Acceptance into the Master of Science in Dental Hygiene Program is required before taking this course.

**DENH 5036. Health Promotion. 3 Credit Hours.**

This course is designed to provide learners a theoretical framework for defining health promotion and set the foundation for students to see potential for health promotion in their work. Topics in this course will use evidence based practice to reflect health promotion theories, prevention, risk assessment, health education, and health policy. Additionally, interventions and strategies will be used to effectively evaluate the determinants of health and the outcomes of individuals, families, groups and communities. Student must be accepted into the Master of Science in Dental Hygiene Program to take this course.

**DENH 5050. Educational Principles and Application. 3 Credit Hours.**

This course is designed to promote high standards of teaching excellence by providing the learner with research based methods, policies, and practices for being an effective higher education teacher. The course will focus on all aspects of teaching: learning theories, course design, teaching methods and learning experiences, course management, and assessment. Specific emphasis will be on developing significant learning experiences for students. Gaining a better understanding of the design process will empower teachers to be more creative and effective in providing significant learning opportunities for students. Through this course, students will apply information gained and ultimately develop a personal educational statement. Acceptance into the Master of Science in Dental Hygiene Program is required to take this course.

**DENH 5080. Survey Methodology. 3 Credit Hours.**

This course is designed to provide the student with an opportunity to expand and strengthen their research knowledge and skills. The course will consist of an in-depth study of survey methodology. Specifically, this course will provide guidance in how to achieve research goals with the use of a survey tool. Current graduates of dental hygiene programs are required to possess skills needed to continue their professional development and encourage life-long learning. These skills include knowledge of survey research methodology sufficient to: facilitate the development, use, and choice of appropriate statistical analysis to develop a unique research project. Advanced education students are preparing for expanded roles in clinical care, public health, education, administration, research and as change agents. To function in any or all these roles, each student has a responsibility to understand and possess skills to apply research principles at an advanced level. Open for Cross Enrollment on Space Available Basis.

**DENH 5091. Special Topics in Dental Hygiene. 1-9 Credit Hours.**

Students will be given an opportunity to gain an in-depth understanding of selected topics through seminars, conferences, projects, or other appropriate learning methods.

**DENH 5903. Organizational Leadership. 3 Credit Hours.**

The purpose of this course is to present foundational principles and theory relating to organizational leadership, communication strategies and behaviors, management of change, decision-making, and other essential elements of leadership. The course will provide students with general information relating to organizational theory, principles and styles. Additional topics will include leadership in educational organizations to include external and internal factors affecting leaders, program planning and as an elective and is open to all advanced education students enrolled in either the B.S. or M.S. Dental Hygiene Program and graduate students in other Health Professions Programs.

**DENH 5924. Biostatistics. 3 Credit Hours.**

This course is an introduction to biostatistics. Emphasis is upon application of statistical methods to biological problems. Topics include descriptive statistics, probability, hypothesis testing, and estimation.

**DENH 5926. Preclinical Teaching Practicum. 4 Credit Hours.**

This course is an introduction to concepts of preclinical instruction. Instruction will include seminar and laboratory application sessions emphasizing theories of psychomotor skill development; diagnosis of performance problems; provision of feedback; identification of cognitive, psychomotor, and affective behaviors; and faculty calibration. This course requires formal agreement with a participating dental hygiene program prior to the beginning of class. (The didactic portion of this course is delivered through Canvas.) Prerequisites: DENH 5050 and DENH 5010. Course Fees: Practicum fee \$10 per hour.

**DENH 6001. The Dental Hygienist Role in the Management of Elder Abuse. 3 Credit Hours.**

This course will allow the learner to acquire the skills and knowledge to recognize the mistreatment of elders. First, the various types of elder abuse will be identified followed by discussion of the prevalence of abuse. Next, case study application will direct the learner in recognizing the risk factors and signs of elder abuse. The legal requirement and major ethical dimensions for the dental hygienist to report abuse will be explored, and an explanation of required abuse documentation will be provided. Finally, techniques for the dental hygienist may work effectively with law enforcement will conclude this course. Acceptance in the Master of Science in Dental Hygiene Program is required before taking the class.

**DENH 6091. Independent Study. 1-3 Credit Hours.**

This course includes independent reading, research, discussion, project, and/or writing under the direction of a faculty member. The course may be repeated for credit. Student must be accepted into the Master of Science in Dental Hygiene Program before taking the course.

**DENH 6098. Thesis. 1-9 Credit Hours.**

The first goal of this course is admit the student to candidacy in the Graduate School of Biomedical Sciences (GSBS) in order that they may begin individual research. The research is supervised by the Thesis Committee of selected faculty. The Thesis Chair will have the primary responsibility of supervising student progress. By conducting an individual research project, collecting and analyzing the data, and developing conclusions based on that data the student will understand the research process. Students will be mindful of the ethical issues associated with human subject and conduct the research under the guidelines of the University of Texas Health Science Center's Internal Review Board (IRB) guidelines. Students who successfully complete the research project with an oral presentation of their findings and submission of a manuscript to a peer reviewed journal or write a thesis will conclude their studies and graduate. The student has an option of submission of a manuscript in the form of writing a full thesis. The thesis option must meet the guidelines of the GSBS. Student must have completed 30 hours of core and elective courses, DENH 5022 Research Apprenticeship in the MS in Dental Hygiene program before taking the course.

**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 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 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 4115. Advanced Electronic Health Record Training (EPIC Based). 4 Credit Hours.**

The primary learning objective of this elective is to prepare students for advanced use of the EPIC EMR in clinical and research environments. Successful completion of this course provides a formal certification as a Physician Builder in EPIC. That designation will permit students to take advantage of advanced features in EPIC as they advance in their careers. The course is broken down into two sections: Physician Builder-Basic and Physician Builder-Advanced. 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. Students must have a working familiarity with the EPIC EMR. One way to establish this familiarity is to have completed a clinical rotation in which EPIC EMR was utilized as a part of the assigned clinical work. Course fees: If the student is not part of the MD/MS in Artificial Intelligence dual-degree program, fee for the EPIC training course will need to be paid by student.

**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 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 <http://www.cc.nih.gov/training/training/crt/infor.html> 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 Educational Experience - LINC. 0 Credit Hours.**

(1) Introduce students to IPE at UT Health San Antonio using the shared IPE framework as defined in the QEP (2) Facilitate interprofessional socialization (3) 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 IPE 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 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 6097. Research. 0.5-12 Credit Hours.**

This course is intended for first-year IMGP 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 7020. Clinical Patient Management. 5 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 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.